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Impact of Targeted Therapeutic Intervention on Language and Literacy Skills in a Child with Intellectual Disability

Srabanti Khemka[1], Kamalika Chowdhury[2], Krapali Kewat[3]

[1]Associate Professor, Sri Aurobindo Institute of Medical Sciences, SAU, Indore
[2]Associate Professor, Sri Aurobindo Institute of Medical Sciences, SAU, Indore.
[3]Intern (BASLP), Sri Aurobindo Institute of Medical Sciences, SAU, Indore.

Corresponding Author: Kamalika Chowdhury

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ABSTRACT

Intellectual Disability is characterized by significant limitations both in intellectual functioning and in adaptive behaviour as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18 (AAIDD, 2010). This case study demonstrates the critical inter play between language and literacy development in a child with mild intellectual disability. The initial assessment revealed significant delays in both receptive and expressive language skills, as well as in literacy abilities. However, following a structured intervention that spanned twenty-four therapy sessions, the child exhibited notable progress in both language and literacy outcomes.

The improvement in receptive and expressive skills, alongside advancements in auditory discrimination and early literacy, underscore the effectiveness of targeted speech and language therapy. These results highlight the necessity for early and individual intervention for children with intellectual disability to foster their communication skills and academic potential. By addressing both language and literacy together, we can enhance their communication skills and educational participation.

KEYWORDS: Intellectual Disability, Language, Literacy, Assessment, Intervention.

INTRODUCTION

Intellectual disability (ID) is identified through three core diagnostic criteria that reflect limitations in both cognition and daily functioning. The first criterion is a significant limitation in intellectual functioning, which refers to general mental ability, including reasoning, planning, problem-solving, abstract thinking, understanding complex ideas, learning quickly, and learning from experience (AAIDD, 2010). The second criterion is a significant limitation in adaptive behaviour, defined by the AAIDD (2010) as "the collection of conceptual, social, and practical skills that have been learned and are performed by people in their everyday lives." Adaptive behaviour encompasses skills in three domains: conceptual, social, and practical and includes everyday activities such as using language appropriately, managing money, following rules, eating, dressing, and developing vocational skills. The third criterion specifies that limitations in intellectual functioning and adaptive behaviour must occur before the age of 18, during the developmental period.

Language and literacy are closely interrelated, each influencing and supporting the development of the other. Language can be described as a systematic and conventional means of human communication through spoken or written symbols (Millward & Hayes, 2012), whereas literacy refers to the ability to understand the relationship between sounds and written words, enabling reading, speaking, and comprehension (Vileghe, 2015). Language provides the foundational skills for literacy (such as phonological awareness, vocabulary, and syntactic knowledge) that are essential for reading and writing. In turn, literacy fosters language development by exposing individuals to a broader range of vocabulary, complex sentence structures, and diverse ideas through reading and writing. Together, these domains function as reciprocal pillars of communication, with each nurturing the development of the other (Christie & Roskos, 2003).

Language learning begins at birth, with the first three years of life representing a critical period of rapid brain development. Literacy development follows a similar trajectory, emerging before formal schooling and often overlapping with oral language skills. Early language and literacy progress through foundational stages that become more complex with age. According to the National Institute of Child Health and Human Development (NICHD, 2000), these foundational literacy skills include: (a) phonemic awareness, (b) knowledge of high-frequency sight words, and (c) the ability to decode words. This dynamic interplay between language and literacy underpins effective communication, cognitive growth, and academic achievement.

Children with intellectual disability frequently experience delays in language acquisition and rarely achieve the same level of linguistic competence as their typically developing peers. Such delays limit their ability to participate fully in community life and to benefit from educational and social opportunities across the lifespan.

The present case study was undertaken to assess a child's profile of challenges and strengths in language and literacy related skills. Identifying these strengths and difficulties is crucial for designing targeted intervention strategies that can foster more effective developmental outcomes.

MATERIALS AND METHODS

The participant was a 4.5-year-old Hindi speaking boy who exhibited developmental delays across multiple domains, including language, motor skills, social functioning, and cognition. A formal psychological assessment confirmed the presence of mild intellectual disability, which informed the selection of therapy goals and guided the overall intervention approach. Informed consent was obtained from the parents prior to initiating therapy.

For the assessment, a combination of standardized and informal tools was used to establish a baseline profile. The Communication DEALL (Karanth, 2007) was administered to determine the child's language age, while the Early Literacy Screening Test (ELST, Shanbal, et al., 2011) and the Grade Level Assessment Device (GLAD; Narayan, 1997) were used to assess reading readiness and phonological awareness. In addition, a developmental checklist was employed to examine cognitive prerequisite skills and social developmental milestones, and the child's attention skills were evaluated to identify challenges in maintaining focus and engagement.

The study was conducted in two phases. In Phase I (Pre intervention Assessment), the tools mentioned above were used to document the child's language, literacy, and developmental profile, thereby identifying strengths and areas of delay. In Phase II (Post intervention Reassessment), the same tools (Communication DEALL, ELST, and GLAD) were re administered following therapy to measure changes in receptive and expressive language, phonological

awareness, literacy readiness, and overall communication. Shifts in attention skills and cognitive functioning were also noted to capture the broader impact of intervention.

The intervention program comprised twenty-four sessions of speech and language therapy, delivered three times per week, with each session lasting 45 minutes. Therapy goals targeted pre linguistic skills, receptive and expressive language, and phonological awareness. Several evidence-based techniques were employed, including prompting with gradual fading to foster independence, incidental teaching to introduce new concepts in natural contexts, and the use of self-talk and parallel talk to model language use. Imitation strategies were applied to encourage repetition and learning from correct language models, while expansion and extension techniques were used to enrich the child's utterances by providing more complex input. Positive reinforcement was consistently provided to motivate and strengthen appropriate responses.

Outcomes were evaluated by comparing pre and post intervention performance across all measures. The reassessment aimed to determine progress in language and literacy development, as well as improvements in attention and cognitive functioning, thereby providing an overall measure of the effectiveness of the therapy program.

RESULTS AND DISCUSSION

This case study presents a comprehensive evaluation of the child's developmental profile before and after targeted therapeutic intervention. Findings are organized into pre and post therapy comparisons across domains of language, cognition, social functioning, and academic skills. Standardized tools, including the Early Literacy Skills Test (ELST), the Communication DEALL (Com DEALL), and the Grade Level Assessment Device (GLAD), were used to assess receptive and expressive language, phonemic awareness, early literacy, mathematical skills, and socio- emotional functioning. Results are reported quantitatively through standardized scores and qualitatively through developmental milestone descriptions.

Phase I: Pre Intervention Assessment

The pre-therapy evaluation revealed developmental delays across multiple domains, as confirmed by teacher reports and clinical observations. The teacher noted that the child often engaged in pushing behaviour towards peers and demonstrated challenges with attention and behaviour regulation, which had led to the need to repeat nursery. From a physical standpoint, the child presented with no disability, and both vision and hearing were within normal limits. Lateralization was clearly established with right hand and right leg dominance. Gross motor coordination appeared intact, as the child could perform finger-to-nose tasks accurately with eyes open and closed and could walk in straight lines forward, backward, and sideways. However, balance was limited, as the child was unable to stand on one leg. Fine motor skills were also inadequate, with noticeable difficulty in holding a pen or spoon and an inability to maintain rhythmic steps.

On the Communication DEALL (Com DEALL), receptive language was relatively age-appropriate (88.3%), while expressive language was delayed (81.6%). Syntax corresponded to Brown's Stage I, and phonological errors included cluster reduction, liquid simplification, stopping, and fronting. Semantic and pragmatic abilities fell within the developmental ranges of 30–36 months and 32–36 months, respectively, indicating relatively preserved social use of language despite expressive limitations.

Academic and literacy readiness was significantly delayed, as reflected on the Grade Level Assessment Device (GLAD). In English reading, oral reading was attempted with appropriate loudness but without finger tracing; silent reading and reading comprehension were absent, and the child could only identify individual letters. In writing, margins and lines were ignored, and letters were produced only when

specifically instructed. Arithmetic skills were limited to oral counting of numbers from 1 to 9, with an absence of number tracing or arithmetic reading. Hindi reading and writing were absent.

Performance on the Early Literacy Skills Test (ELST) was also poor, with a total score of seven, reflecting marked deficits in auditory discrimination, literacy, and mathematical skills. Taken together, these findings indicate delays in motor, cognitive, language, and academic domains. The overall profile supported a provisional diagnosis of spoken language disorder with early literacy deficits, secondary to mild intellectual disability, highlighting the need for structured and targeted therapeutic intervention.

Phase II: Post Intervention Reassessment

Following 24 sessions of structured speech and language therapy, reassessment demonstrated measurable improvements across several domains.

ELST Results. Post-intervention, the total score increased from 7 to 18, with the most notable gains in auditory discrimination, followed by improvements in early literacy. Verbal memory and mathematical skills also improved moderately, while oral language remained unchanged, suggesting the need for continued focus in this area (Table 1).

Table 1. Pre versus Post Therapy Scores on ELST

Domain	Pre-Therapy	Post-Therapy
Auditory Discrimination	0	5
Oral Language	2	2
Verbal Memory	3	4
Early Literacy	2	4
Mathematical Skills	0	2
Total Score	7	18

Com-DEALL Results. Improvements were observed in receptive and expressive language, cognition, and emotional skills, with expressive language showing the largest gain. No change was recorded in gross motor, fine motor, or activities of daily living, while social skills showed only modest improvement (Table 2).

Table 2. Pre versus Post Therapy Scores on Com-DEALL

Domain	Pre-Therapy	Post-Therapy
Gross Motor (GM)	54–60 months	54–60 months
Fine Motor (FM)	54–60 months	54–60 months
Activities of Daily Living (ADL)	54–60 months	54–60 months
Receptive Language (RL)	36–42 months	48–54 months
Expressive Language (EL)	24–30 months	42–54 months
Cognitive Skills (COG)	36–42 months	48–54 months
Social Skills (SOC)	42–48 months	48–54 months
Emotional Skills (EMO)	36–42 months	48–54 months

GLAD Results. Substantial progress was noted in early academic skills, including phoneme identification, literacy, and numeracy (Table 3). These improvements are consistent with existing literature highlighting that children with mild intellectual disability can achieve meaningful academic gains when provided with structured, targeted interventions.

Table 3. Pre versus Post Therapy Scores on GLAD

Subject	Pre-Therapy	Post Therapy
English	35% (Frustational Level)	57.4% (Instructional Level)
Hindi	20.6% (Frustational Level)	55% (Instructional Level)
Mathematics	10% (Frustational Level)	46.2% (Instructional Level)

The findings of this case study highlight the effectiveness of structured speech and language therapy in enhancing receptive and expressive language, phonological awareness, early literacy, cognitive skills, and emotional regulation in a child with mild intellectual disability. At the same time, limited progress was observed in motor functioning, activities of daily living, and social interaction, underscoring the need for a more holistic intervention approach that addresses multiple developmental domains. These results demonstrate that children with mild intellectual disability can make measurable gains in communication and early academic skills when provided with targeted therapy, yet they also emphasize the importance of integrating motor, functional, and socio emotional training into intervention plans. While the short-term outcomes are promising, further research is needed to determine the long-term sustainability of these improvements. Longitudinal studies would help establish whether developmental gains are maintained over time, and comparative research exploring the efficacy of diverse approaches such as behavioral therapies, cognitive training, and social skills programs could offer deeper insights into tailoring interventions for different subgroups within this population.

DISCUSSION

The findings of this case study demonstrate that targeted, individualized intervention can significantly enhance language, literacy, and cognitive skills in children with mild intellectual disability (ID). The most substantial gains were observed in auditory discrimination and early literacy skills; consistent with earlier evidence that structured, evidence-based interventions promote academic readiness when aligned with cognitive abilities (Alodat et al., 2020; Saeed, Sarwar, & Arif, 2024). Improvements in receptive and expressive language also align with prior studies reporting that language focused therapies yield measurable progress in vocabulary, syntax, and communication effectiveness (Fernández-Villardón et al., 2021).

Social and emotional skills showed modest improvements, though less robust compared to language and literacy outcomes. This finding reflects earlier reports that social communication often requires explicit, targeted training beyond language intervention (Jacob, Edozie, & Pillay, 2022). Limited changes in motor functioning and activities of daily living were expected, as these domains were not primary therapy targets, underscoring the need for multidisciplinary input in comprehensive intervention planning.

Caregiver involvement emerged as a critical facilitator of progress, as parental participation reinforced therapy goals across home and school contexts. This observation echoes previous findings that consistent collaboration among families, educators, and therapists enhances generalization and long-term maintenance of skills (Kelty, Wakabayashi, & Prag, 2020; Cummings, Sills-Busio, Barker, & Dobbins, 2015).

In the Indian context, where early identification of intellectual disability and access to specialized rehabilitation services are often limited (Kumar et al., 2012), these findings carry important clinical and educational implications. Bilingual demands, large classroom sizes, and resource constraints may hinder consistent support in mainstream schools. Thus, empowering parents and teachers with simple, structured strategies to reinforce therapy goals is essential. Integrating speech language therapy with school-based programs and adopting culturally and linguistically appropriate assessment tools can maximize developmental gains. This case highlights the pressing need for collaborative, context-sensitive approaches to ensure that children with intellectual disability in India achieve their full communicative and academic potential.

CONCLUSION

This case study underscores the importance of targeted speech and language intervention

in promoting communication and early academic skills in children with mild intellectual disability. The child demonstrated significant progress in receptive and expressive language, auditory discrimination, and literacy following twenty-four structured therapy sessions, highlighting the reciprocal relationship between language and literacy. These findings reinforce the necessity of individualized, developmentally appropriate intervention to support broader cognitive, social, and academic growth.

While the intervention yielded notable language and literacy gains, limited improvement in motor and daily living skills emphasizes the need for a holistic, multidisciplinary approach. Collaboration among therapists, educators, and caregivers remains crucial to ensure skill generalization across home and school contexts. Future research should focus on longitudinal outcomes and context-sensitive intervention models tailored to the Indian educational and cultural environment, thereby strengthening the long-term developmental trajectories of children with intellectual disability.

These findings suggest that speech language pathologists should incorporate literacy-focused strategies early in intervention for children with mild intellectual disability, alongside broader developmental support.

Declaration by Authors

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