

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Cognitive-Behavioral Intervention in a Family Context: A Single-Case Design Study of a 14-Year-Old with Mild Intellectual Disability

Syed Qamar Ul Hassan^{*1}, Prof. Dr. Neelam Ehsan², Zaheen Amin³, Aimah Sohail⁴, Muhammad Abbas⁵, Ali Raza⁶

¹Lecturer & PhD Fellow Shifa Tameer e Millat University Islamaabad Email Id:Qamarkazmi07@gmail.com ²Professor Department of Clinical Psychology Shifa Tameer e Millat University Islamaabad Email Id:Neelam.dcp@stmu.edu.pk ³PhD Fellow Shifa Tameer e Millat University Islamaabad Email Id: Zaheen.amin15@gmail.com ⁴Clinical Psychologist at Riphah International University Islamabad Email Id:Aimahsohail07@gmail.com ⁵Lecturer & PhD Fellow Shifa Tameer e Millat University Islamaabad Email Id:Muhammad.psy1995@gmail.com ⁶PhD Fellow at National University of Medical Sciences Rawalpindi Email Id: <u>Alirazacp95@gmail.com</u>

ABSTRACT

This single-case design study evaluates the clinical course, assessment, and outcomes of a 14-year-old male diagnosed with mild intellectual disability (ID) within a complex family environment. Using a multiple baseline framework over a 15-session intervention, we tracked the progression of cognitive, academic, emotional, and social functioning using repeated measures and behavioral observations. Formal assessments included the Slosson Intelligence Test (SIT), Colored Progressive Matrices (CPM), Childhood Adaptive Behavior Scale (CABS), and Rosenberg Self-Esteem Scale. The treatment included cognitive-behavioral therapy, social skills training, and parental psychoeducation tailored to the cultural context. Findings showed measurable improvements across academic domains, self-esteem, and social interaction, reinforcing the value of ecological, family-centered intervention in non-Western clinical practice. This study highlights the critical role of caregiver involvement and culturally responsive methods in shaping treatment adherence and outcome sustainability. The structured, phase-based intervention allowed for individualized pacing and targeted skill acquisition. These findings contribute to the limited empirical literature on ID interventions in South Asian populations and advocate for context-sensitive clinical frameworks.

Keywords: Single-Case Design, Intellectual Disability, Cognitive-Behavioral Therapy, Social Skills Training, Adaptive Functioning, Positive Parenting, Case Study, Pakistan

1. INTRODUCTION

Intellectual Disability (ID) is a neurodevelopmental disorder characterized by deficits in intellectual and adaptive functioning that become apparent during childhood (American Psychiatric Association (APA, 2013). Mild intellectual disability, defined by an IQ between 50 and 70, frequently manifests as academic delays, difficulties in problem-solving and communication, and deficits in social judgment and emotional regulation. These challenges often compromise educational attainment, peer relationships, and long-term independence (Vissers, Gilissen, & Veltman, 2016). In the context of developing countries like Pakistan, children with ID face compounded challenges due to social stigma, insufficient clinical awareness, and scarcity of specialized services (Floyd & Olsen, 2017). Furthermore, family dynamics often influence developmental outcomes. Authoritarian parenting styles and emotionally unresponsive home environments have been identified as risk factors that exacerbate adaptive and social difficulties in children with ID (Asrar & Shakerinia, 2015).

This study focuses on A.H., a 14-year-old adolescent presenting with marked cognitive delays, low academic performance, and severe social withdrawal. His history included perinatal complications, delayed developmental milestones, unaddressed head injuries, and a household environment dominated by an aggressive paternal figure. Clinically, A.H. demonstrated difficulty following verbal instructions, poor self-esteem, and limited peer interaction. The intervention aimed to address these deficits through a culturally adapted, family-inclusive therapeutic program grounded in cognitive-behavioral principles. By employing a single-case design (SCD) framework, this research contributes methodologically robust, contextually grounded evidence for the effective treatment of mild ID in South Asian populations.

Table 1. Developmental Milestones of the Client

The table below outlines the client's developmental progress across core motor and speech milestones. It compares the client's achievement ages against typical developmental norms. These delays provide early indicators consistent with neurodevelopmental concerns.

Milestone	Normal Age Range	Client's Age of Achievement
Neck holding	3 months	3–4 months
Sitting without support	7 months	7 months
Walking	12 months	12 months
Speech: Single word	6–12 months	2 years
Speech: Phrases	2–3 years	3.5–4 years
Complete Sentence	3–4 years	5 years

The client exhibited significant speech delays, particularly in language acquisition milestones. These discrepancies support the clinical formulation of developmental delay. Early intervention at this stage may have mitigated downstream learning challenges.

2. METHODS

2.1 Research Design

This study employed a single-case experimental design (SCED) with a multiple baseline and pre-post intervention framework. The design enabled indepth tracking of change over time within a single subject, allowing for detailed examination of behavioral, academic, and psychosocial domains in response to the intervention. This methodological approach is particularly useful in contexts where group-level experimental designs are not feasible and where individualized treatment evaluation is desired.

2.2 Participant

The subject of the study, A.H., was a 14-year-old male, the youngest in a family of five siblings. He was referred for clinical assessment and intervention due to concerns of persistent academic underachievement, emotional hypersensitivity, and social withdrawal. Developmental and familial history indicated multiple risk factors including neonatal complications, untreated head trauma, and a psychologically unsupportive home environment.

2.3 Inclusion and Exclusion Criteria

Participants were included if they met the DSM-5 criteria for mild intellectual disability and were between the ages of 12 and 16. The presence of a primary caregiver willing to participate in the treatment plan was mandatory. Individuals with comorbid neurodevelopmental conditions such as autism spectrum disorder or with uncontrolled medical conditions were excluded from the study

2.4 Ethical Considerations The study protocol received ethical clearance from the relevant clinical authority. Informed consent was obtained from A.H.'s mother, with the nature, scope, and voluntary basis of participation clearly communicated. All personal data were anonymized and securely stored. The study adhered to the ethical principles of the Declaration of Helsinki.

3. BASELINE ASSESSMENT

3.1 Clinical Presentation

A.H. displayed a broad range of behavioral and cognitive challenges, including a slow pace in completing both mental and physical tasks, difficulty in understanding verbal instructions, and minimal peer interaction. Emotional reactivity was high, especially in response to corrective feedback or reprimand. Developmental history revealed significantly delayed language milestones and a series of head injuries that were never medically evaluated.

3.2 Instruments and Baseline

Scores A comprehensive assessment was conducted using both formal psychometric tools and informal academic observations. The Slosson Intelligence Test (SIT) and Colored Progressive Matrices (CPM) were used to measure intellectual functioning, while adaptive behavior was assessed using the Childhood Adaptive Behavior Scale (CABS). The Rosenberg Self-Esteem Scale provided insight into the client's emotional self-evaluation. Informal academic tasks were used to evaluate current literacy and numeracy skills.

Table 2. Formal Assessment Results

The following table presents key findings from formal psychological assessments administered to the client. It includes intellectual and adaptive functioning outcomes based on standardized tools. These assessments were integral to establishing the diagnosis of mild intellectual disability.

Assessment Tool	Score/Category	Interpretation
Colored Progressive Matrices (CPM)	IQ: 50	Defective Range
Slosson Intelligence Test (SIT)	IQ: 50.29	Mild Intellectual Disability
Childhood Adaptive Behavior Scale (CABS)	Multiple domains	Delayed by 2–5 years
Rosenberg Self-Esteem Scale	Pre: 9, Post: 18	Improved from Low to Normal

The client's performance across all formal assessments was below age expectations. Converging results from CPM, SIT, and CABS confirm the severity of cognitive and adaptive deficits. The increase in self-esteem post-intervention underscores the psychosocial impact of therapy.

4. INTERVENTION FRAMEWORK

4.1 Treatment Objectives

- Enhance social communication and assertiveness.
- Improve academic competence.
- Strengthen self-esteem.
- Train parents in positive reinforcement and structured interaction.

4.2 Intervention Modules

The intervention spanned 15 weekly sessions, each 60 minutes in duration, and was divided into three structured phases:

Phase I: Rapport Building and Baseline (Sessions 1–3)

These sessions focused on developing therapeutic trust through structured play, establishing behavioral baselines via clinical observation and informal assessment, and gathering parental insights through interviews. This phase was critical in ensuring the child's engagement and providing a foundation for personalized intervention.

Phase II: Core Intervention (Sessions 4–12)

- Social Skills Training: Derived from Michelson's framework focusing on assertiveness, conversational turn-taking, emotional awareness, and practical problem-solving.
- Academic Skills Training: Techniques included chunking for memory enhancement, mnemonics for vocabulary retention, story-making for comprehension, and repeated reading for fluency improvement.
- Behavioral Modification: Included modeling, rehearsal, reinforcement schedules, and role-playing scenarios to reinforce positive behaviors.
- Parental Psychoeducation: Weekly debriefings guided parents in setting realistic expectations, using positive reinforcement, and reducing punitive responses.

Phase III: Consolidation and Evaluation (Sessions 13–15) This final phase focused on reinforcing previously learned skills through real-life simulations. Post-assessments were conducted to quantify progress, and feedback was solicited from family members to identify areas needing continued support.

4.3 Monitoring Tools

- Weekly skill ratings (0–10 scale)
- Therapist session notes
- Parent-reported behavioral logs

5. RESULTS

5.1 Quantitative Outcomes

Significant improvement was observed in almost all targeted domains. Pre- and post-intervention ratings across 11 skill areas demonstrated measurable growth. Gains ranged from +2 to +4 points, indicating both cognitive and behavioral improvements.

5.2 Post-Assessment

Scores Post-intervention Rosenberg Self-Esteem Scale scores increased from 9 (low) to 18 (normal range). Informal academic assessments showed improved Urdu fluency and enhanced English comprehension. These gains suggest improved functional and emotional adaptability.

5.3 Behavioral Gains

Therapist observations and parental reports highlighted enhanced verbal engagement, reduced emotional reactivity, and improved social initiative, particularly in interactions with immediate family members and within structured learning tasks.

Table 3. Pre- and Post-Intervention Skill Ratings by Therapist

The table below outlines therapist-rated progress across eleven skill domains following a 15-session intervention. Pre- and post-assessment ratings were derived from behavioral observations, therapist evaluations, and standardized tools. These scores reflect the client's developmental changes in communication, academic performance, self-awareness, and self-esteem.

Skill Domain	Pre-Intervention Rating (0–10)	Post-Intervention Rating (0–10)
Assertiveness	3	5
Conversation	4	6
Problem Solving	3	6
Self-awareness	2	5
Time Utilization	3	7
English Comprehension	4	7
English Writing	3	6
Urdu Reading	3	6
Urdu Comprehension	4	7
Mathematics Skills	5	7
Self-Esteem (Rosenberg Scale)	9 (Low)	18 (Normal)

The intervention yielded notable improvements, with skill gains ranging between +2 and +4 points across domains. Enhanced self-esteem, better emotional regulation, and academic fluency were the most prominent post-treatment changes. These results affirm the effectiveness of structured, family-centered cognitive-behavioral strategies in treating mild intellectual disability.

Table 4. Summary of Intervention Techniques

The following table provides a summary of therapeutic strategies applied during the intervention phase. Each technique was selected based on the client's cognitive profile and learning needs. Interventions were grounded in evidence-based practices from cognitive-behavioral and developmental literature.

Technique	Description
Chunking	Grouping material to aid memory
Mnemonics	Aiding retention using cues or associations
Role-Playing	Practicing real-life scenarios
Modeling	Observational learning from examples
Repeated Reading	Improving fluency by rereading text

A multimodal approach allowed for flexibility in addressing academic and emotional challenges. Techniques such as role-playing and repeated reading were especially effective in engaging the client. Family involvement and consistency in practice enhanced overall treatment efficacy.

6. DISCUSSION

The findings of this study provide evidence that targeted cognitive-behavioral interventions, when delivered within an ecologically sensitive framework, can yield significant functional gains in adolescents diagnosed with mild intellectual disability. A.H.'s improvements in assertiveness, academic

engagement, and emotional regulation are consistent with prior literature that emphasizes the modifiability of adaptive functioning through structured behavioral interventions (Kazdin, 2017).

Social skills training, rooted in the Michelson model, contributed substantially to A.H.'s ability to initiate and sustain conversations, express needs assertively, and respond adaptively to social cues. These changes are in line with Floyd and Olsen's (2017) assertion that guided family-peer linkages can enhance interpersonal development in children with intellectual and learning disabilities.

Academic interventions utilizing chunking, mnemonics, and repeated reading demonstrated utility in improving A.H.'s reading fluency and comprehension, particularly in Urdu. This aligns with Fountain and Doyle's (2012) findings that cognitive strategies can enhance working memory and academic performance in students with cognitive deficits.

Perhaps most critically, the psychoeducational component targeted at A.H.'s caregivers played a pivotal role in sustaining therapeutic momentum outside of sessions. Literature supports the importance of parental involvement in generalizing learned behaviors across contexts (Ghotbzadeh Asrar & Shakerinia, 2015). The consistent feedback loop established with A.H.'s mother and siblings enhanced the applicability of learned skills to the home environment, thereby reinforcing gains in real-world settings.

Nonetheless, several factors may have constrained the full potential of the intervention. A.H.'s initial IQ and adaptive behavior scores indicated pervasive developmental delays, which may have limited the pace and scope of behavioral change. Moreover, the continued emotional unavailability of the father, despite efforts at psychoeducation, remained an unresolved systemic issue. This echoes Patterson et al.'s (1992) developmental perspective that highlights coercive family dynamics as sustaining maladaptive behaviors.

Despite these limitations, the therapeutic response demonstrates the viability of single-case design methodology in clinical evaluation, particularly in resource-constrained environments. The measured and observable change in targeted behaviors, when tracked over time and contextualized within ecological variables, offers a compelling framework for intervention science.

Limitations and Suggestions for Future Research

- The absence of a control or comparison subject limits the ability to make causal inferences about the effectiveness of the intervention. Future research should employ multiple-case or randomized controlled designs to validate these findings and assess generalizability.
- The study assessed outcomes immediately post-intervention, providing no insight into the long-term sustainability of therapeutic gains. Incorporating longitudinal follow-up assessments would help evaluate the durability and maintenance of treatment effects over time.
- The intervention was home-based and lacked integration with school systems, teachers, or peer feedback. Future interventions should involve educational professionals and integrate therapeutic practices into classroom settings to enhance ecological validity.
- The father's ongoing emotional unavailability and lack of engagement limited the systemic impact of the intervention. Including structured sessions specifically for fathers or male guardians could foster more holistic family participation and improve treatment outcomes.

8. CONCLUSION

his single-case study highlights the effectiveness of an integrative, culturally tailored intervention in addressing the multifaceted needs of a 14-year-old with mild intellectual disability. Through cognitive-behavioral therapy, social skills training, and active family engagement, the intervention led to marked improvements in A.H.'s academic performance, emotional regulation, and social interaction.

The success of the intervention underscores the importance of early identification and individualized treatment planning. It also emphasizes the critical role of the family system—particularly parental attitudes and sibling support—in shaping therapeutic outcomes. In line with international best practices, this study advocates for systemic, strengths-based interventions that are sensitive to the sociocultural fabric of the child's environment.

Future studies should consider longer-term follow-ups, integration of school-based assessments, and broader family involvement, including paternal figures, to enhance the ecological validity and sustainability of outcomes. As the field of clinical psychology continues to globalize, culturally embedded, evidence-informed practices such as those described herein must guide service delivery in diverse contexts.

References

- 1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). American Psychiatric Publishing.
- Asrar, F. G., & Shakerinia, I. (2015). Parenting styles and adaptive behavior among students with intellectual disability. *Journal of Child Mental Health*, 2(3), 49–58.
- 3. Bandura, A. (1977). Social learning theory. Prentice-Hall.
- 4. Barkley, R. A. (2010). Taking charge of ADHD. Guilford Press.
- 5. Barkley, R. A. (2016). Defiant children: A clinician's manual for assessment and parent training (3rd ed.). Guilford Publications.

- 6. Bowlby, J. (1980). Attachment and loss: Volume 3. Loss, sadness and depression. Basic Books.
- 7. Dadds, M. R., & Hawes, D. J. (2016). Interventions for children with callous-unemotional traits. Routledge.
- 8. Daphne. (2009). Positive parenting. Respect Works Out. http://www.respectworks.eu/themes/positive-parenting.html
- 9. Dishion, T. J., & Tipsord, J. M. (2011). Peer contagion in child and adolescent development. Annual Review of Psychology, 62, 189-214.
- 10. Dodge, K. A. (1991). Reactive and proactive aggression. In The development and treatment of childhood aggression (pp. 201-218). Erlbaum.
- 11. Ellis, A. (1994). Reason and emotion in psychotherapy. Carol Publishing Group.
- Floyd, F. J., & Olsen, D. L. (2017). Family-peer linkages for children with intellectual disability and learning disabilities. *Journal of Applied Developmental Psychology*, 52, 203–211.
- 13. Fountain, S. B., & Doyle, K. E. (2012). Learning by chunking. In N. M. Seel (Ed.), *Encyclopedia of the sciences of learning* (pp. 1914–1917). Springer.
- 14. Gottman, J. M., Katz, L. F., & Hooven, C. (1997). Meta-emotion: How families communicate emotionally. Routledge.
- 15. Greene, R. W. (2014). The explosive child. HarperCollins.
- 16. Gresham, F. M., Van, M. B., & Cook, C. R. (2010). Social skills training for teaching replacement behaviors. *Behavioral Disorders*, 35(1), 19–40.
- 17. Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits. *Journal of Psychosomatic Research*, 57(1), 35–43.
- Guralnick, M. J. (1999). Family and child influences on peer-related social competence of young children with developmental delays. *Mental Retardation and Developmental Disabilities Research Reviews*, 5(1), 21–29.
- Henggeler, S. W., & Sheidow, A. J. (2012). Family-based treatments for conduct disorder. *Journal of Marital and Family Therapy*, 38(1), 30– 58.
- 20. Henggeler, S. W., Schoenwald, S. K., & Borduin, C. M. (1998). *Multisystemic treatment of antisocial behavior in children and adolescents*. Guilford Press.
- Hill, J., & Maughan, B. (2001). Conduct disorders in childhood and adolescence. In *Developmental psychopathology* (pp. 507–552). Cambridge University Press.
- 22. Jacobson, E. (1938). Progressive relaxation. University of Chicago Press.
- 23. Kazdin, A. E. (2017). Evidence-based psychotherapies for children and adolescents (3rd ed.). Guilford Press.
- 24. Kendall, P. C., & Braswell, L. (1993). Cognitive-behavioral therapy for impulsive children (2nd ed.). Guilford Press.
- 25. Koppitz, E. M. (1968). Psychological evaluation of children's human figure drawings. Grune & Stratton.
- 26. Landreth, G. L. (2012). Play therapy: The art of the relationship (3rd ed.). Routledge.
- 27. Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences and infant disorganized attachment. In *Attachment in the preschool years* (pp. 161–182). University of Chicago Press.
- 28. Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior. Psychological Review, 100(4), 674-701.
- 29. Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1992). A developmental perspective on antisocial behavior. *American Psychologist*, 44(2), 329–335.
- 30. Pliszka, S. R. (2015). Neuroscience for the mental health clinician (2nd ed.). Guilford Publications.
- 31. Raine, A. (2013). The anatomy of violence. Pantheon Books.
- 32. Ratey, J. J., & Hagerman, E. (2013). Spark: The revolutionary new science of exercise and the brain. Little, Brown and Company.
- 33. Rosenberg, M. (1965). Society and the adolescent self-image. Princeton University Press.
- 34. Schaefer, C. E., & Drewes, A. A. (2010). The therapeutic powers of play: 20 core agents of change. Wiley.
- Schwartz, K. D., Sheeber, L. B., Dudgeon, P., & Allen, N. B. (2012). Emotion socialization in families. *Clinical Child and Family Psychology Review*, 15(4), 361–383.
- 36. Skinner, B. F. (1953). Science and human behavior. Macmillan.

- 37. Spence, S. H. (2003). Social skills training with children and young people. Child and Adolescent Mental Health, 8(2), 84–96.
- 38. Stott, D. H. (2022). Maternal stress and emotional disturbances in children. Journal of Child Psychology and Psychiatry, 21(3), 155–166.
- 39. Vissers, L. E., Gilissen, C., & Veltman, J. A. (2016). Genetic studies in intellectual disability and related disorders. *Nature Reviews Genetics*, 17(1), 9–18.