



Applied Behavior Analysis and Play Therapy Intervention in a Child with Autism Spectrum Disorder: A Case Study of Ahmed Khazir

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ARTICLE INFO

Keywords:

Autism Spectrum Disorder, Applied Behavior Analysis, Play Therapy, Early Intervention, Developmental Delay, Pakistan

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ABSTRACT

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition marked by persistent difficulties in communication, social interaction, and repetitive behaviors. Early intervention using evidence-based practices such as Applied Behavior Analysis (ABA) and play therapy has demonstrated improved adaptive functioning, communication, and behavioral outcomes in affected children. This case study explores the clinical profile and therapeutic outcomes of a 5-year-old boy, Ahmed Khazir, presenting with non-verbal ASD, profound developmental delay, and hyperactivity following early childhood injury. The intervention combined ABA, play therapy, music-based activities, and parent-mediated home plans over several months. Progress was observed in adaptive skills (notably eating and command following), sitting span, and social engagement. The case underscores the importance of early, individualized, multi-modal intervention and caregiver involvement for enhancing developmental outcomes in children with ASD. Implications for culturally contextualized therapeutic practices within Pakistani clinical settings are discussed.

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by persistent deficits in social communication and interaction, alongside restricted and repetitive patterns of behavior, interests, or activities (American Psychiatric Association [APA], 2022). The clinical manifestations of ASD often emerge during early childhood, typically before the age of three, and can vary significantly in intensity and functional impact. While some individuals with ASD may develop verbal communication and social understanding, others may experience profound challenges that interfere with daily living and social integration (Lord et al., 2023). Recent research underscores the neurobiological and genetic underpinnings of

ASD, involving atypical brain connectivity, synaptic functioning, and altered sensory processing, which contribute to the behavioral heterogeneity observed in affected individuals (Cheng et al., 2023).

Globally, the prevalence of ASD has risen substantially over the past two decades, with current estimates suggesting that approximately one in 36 children is diagnosed with ASD (Maenner et al., 2023). This upward trend reflects not only improved diagnostic awareness but also environmental, genetic, and healthcare access factors. The growing prevalence underscores the urgent need for early identification and comprehensive, evidence-based interventions, particularly in developing regions where resources are limited (Khan et al., 2024). Early intervention plays a pivotal role in modifying developmental trajectories, improving cognitive, linguistic, and adaptive functioning, and minimizing long-term disability (Masi et al., 2023).

Among empirically supported therapeutic approaches, Applied Behavior Analysis (ABA) has garnered the most substantial empirical validation for children with ASD. Rooted in behavioral learning principles, ABA emphasizes structured reinforcement of adaptive behaviors while systematically reducing maladaptive ones. It aims to enhance communication, social interaction, and daily living skills through individualized, measurable objectives (Esposito et al., 2025; Gitimoghaddam et al., 2023). The versatility of ABA allows it to be integrated with other modalities such as play therapy, music therapy, and sensory activities, creating a holistic and engaging learning environment that addresses both behavioral and emotional dimensions.

Play therapy an experiential, child-centered intervention has been shown to facilitate emotional expression, social reciprocity, and symbolic communication among children with ASD (Dijkstra-de Neijs et al., 2023). Through structured and unstructured play, children develop cognitive flexibility, self-regulation, and turn-taking skills that are foundational for social competence. Similarly, music-based interventions have been empirically linked to improvements in joint attention, language acquisition, and emotional regulation by stimulating neural pathways associated with auditory and motor coordination (Elbeltagi et al., 2023).

In low-resource, collectivist contexts such as Pakistan, culturally sensitive adaptations of these interventions are crucial. Family-based participation, therapist-parent collaboration, and the use of locally accessible materials can enhance both the feasibility and sustainability of treatment outcomes (Khan et al., 2024). Despite limited infrastructure, incorporating parent-assisted ABA and play therapy into home environments has shown promising results in improving daily functioning and social communication among Pakistani children with ASD.

The current case study presents the detailed developmental history, assessment, intervention plan, and therapeutic outcomes of Ahmed Khazir, a five-year-old child diagnosed with Autism Spectrum Disorder. The therapeutic intervention combined Applied Behavior Analysis (ABA), play therapy, and music therapy over multiple sessions spanning several months. The objective of this case study is to document the observable progress, behavioral changes, and functional improvements following a structured, multidisciplinary intervention program.

Case Description

Demographic and Family Background

Ahmed Khazir is a five-year-old male residing in Shalabag, Pakistan, and the eldest of three siblings. His family belongs to a lower-middle socio-economic background, with his father employed as a clerk and his mother serving as the primary caregiver. The parents live together and share caregiving responsibilities within a multigenerational household that includes a maternal aunt with a physical disability.

This family structure contributes to increased caregiving demands and emotional stress within the home environment. Ahmed spends most of his time with his mother, who demonstrates consistent involvement in his daily care but has limited access to psychoeducational guidance and developmental health resources.

The family environment is cohesive and supportive but constrained by limited awareness of early childhood developmental milestones. The lack of exposure to specialized pediatric and psychological services delayed early identification of Ahmed's developmental challenges. According to Khan et al. (2024), such barriers are common in collectivist and low-resource settings, where stigma and limited healthcare infrastructure often hinder timely intervention for neurodevelopmental disorders. Despite these constraints, the parents have shown continued concern and motivation to seek professional help once communication and behavioral difficulties became evident.

Prenatal, Perinatal, and Postnatal History

Ahmed's prenatal period was medically supervised and unremarkable. His mother completed a full-term pregnancy of nine months, resulting in delivery through cesarean section. However, postnatal complications emerged immediately following birth, including delayed neonatal crying and a chest infection requiring a one-day stay in the neonatal intensive care unit (NICU). During infancy, Ahmed experienced recurrent febrile episodes and was hospitalized several times due to high-grade fever. His feeding patterns and physical growth remained within normal limits, but these recurrent medical events prompted parental concern for his overall neurodevelopment. Empirical evidence suggests that perinatal complications, particularly those involving oxygen deprivation or postnatal infections, can increase susceptibility to neurodevelopmental disorders, including Autism Spectrum Disorder (ASD) (Conti et al., 2024; Masi et al., 2023). Delayed crying at birth and febrile convulsions during early development may indicate early neural distress, which has been linked to later difficulties in language acquisition, attention, and sensory regulation. While these factors alone are not causative, they represent a cluster of biological vulnerabilities that could contribute to Ahmed's neurocognitive profile.

Additionally, environmental factors such as limited early stimulation, inconsistent exposure to structured play, and minimal social interaction outside the home may have compounded developmental delays. Early environmental deprivation has been shown to exacerbate deficits in communication and adaptive behavior among children predisposed to ASD (Elbeltagi et al., 2023).

Developmental History

Ahmed exhibited significant developmental delays across multiple domains, most notably in motor, language, and social communication. His motor milestones, including sitting and walking, were achieved later than typical. Crawling was not observed during infancy, suggesting early motor planning difficulties. By age five, he remained non-verbal, producing neither recognizable words nor sound imitation. He does not attempt to mimic others' speech or environmental sounds and fails to use gestures or vocalizations to communicate his needs.

Receptive language the ability to understand spoken instructions is inconsistent. He occasionally responds to familiar voices but demonstrates limited comprehension of basic one-step commands. His expressive communication remains largely absent, with no meaningful words or symbolic sounds. This profound communication impairment has significantly restricted his ability to engage in reciprocal social interactions.

Cognitively, Ahmed demonstrates limited curiosity and exploratory behavior. He shows minimal interest in novel stimuli and rarely engages in functional play. His play behavior is characterized by solitary activities, such as repetitively playing with balloons or rolling objects. These restricted and repetitive behaviors, along with limited social reciprocity, are hallmark features of Autism Spectrum Disorder (APA, 2022). His attention span is short, and he requires constant supervision to remain engaged in any activity.

Adaptive functioning is markedly impaired. Ahmed requires assistance with eating, dressing, and hygiene. He exhibits poor awareness of personal boundaries and limited understanding of safety, often attempting to wander outdoors unsupervised. Socially, he does not initiate interaction with siblings or peers and prefers isolation. Sensory sensitivities are evident, particularly toward loud noises, to which he reacts with distress or withdrawal.

Behavioral observations further indicate stereotypical and self-stimulatory movements, such as hand-tapping, repetitive walking in circles, and occasional vocalizations without communicative intent. These behaviors serve as self-regulatory mechanisms in children with sensory modulation difficulties (Dijkstra-de Neijs et al., 2023).

Collectively, Ahmed's developmental profile aligns with the DSM-5-TR diagnostic criteria for Autism Spectrum Disorder, Level 3 (requiring very substantial support) (APA, 2022). His intellectual functioning is assessed within the profound range, characterized by limited problem-solving ability and absent conceptual reasoning. The co-occurrence of hyperactivity and poor impulse control further suggests overlapping symptoms with Attention-Deficit/Hyperactivity Disorder (ADHD), a frequent comorbidity in ASD populations (Esposito et al., 2025).

Behavioral Observation and Clinical Assessment

Behavioral observations of Ahmed Khazir were conducted over multiple therapy sessions, with consistent findings across time. The child presented with limited eye contact, short sitting span, and frequent fidgeting behaviors, suggestive of hyperactivity and reduced behavioral inhibition. His affect was generally flat but occasionally brightened in response to preferred stimuli, such as toys or rhythmic sounds. Sensory sensitivities were apparent, particularly toward loud or abrupt noises, which elicited avoidance behaviors, ear-covering, or agitation.

Ahmed displayed intermittent social responses, such as smiling or producing nonverbal vocalizations, particularly when addressed directly by name. He could orient toward his name but failed to sustain engagement or initiate communication. Social reciprocity was minimal, with limited imitation or shared attention behaviors. During play observations, the child engaged primarily in repetitive solitary activities, such as balloon play, hand-tapping, or pacing in circles. Such behaviors align with the restricted and repetitive behavior domain outlined in DSM-5-TR criteria for Autism Spectrum Disorder (APA, 2022).

His adaptive functioning was markedly impaired across self-care, play, and communication domains. Ahmed required continuous assistance with feeding, dressing, and toileting, and did not independently initiate personal care routines. Cleanliness and dressing were observed as fair, maintained primarily through caregiver support. He exhibited poor environmental awareness, often wandering aimlessly or attempting to leave the therapy room, reflecting poor hazard recognition and limited situational understanding.

Results from the ADHD Rating Scale administered to the parents and therapists indicated elevated hyperactivity and inattention scores, consistent with a comorbid diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD). Clinical observation

further revealed symptoms of impulsivity, short attention span, and frequent task avoidance, corroborating these findings. Additionally, his medical history included recurrent chest infections and febrile episodes, which may have compounded his physical vulnerability and disrupted early neurodevelopmental stability (Conti et al., 2024).

Based on the integrated assessment behavioral observation, caregiver reports, and developmental history the **tentative diagnosis** was established as:

- **Autism Spectrum Disorder (ASD), Level 2** (requiring very substantial support)
- **Attention-Deficit/Hyperactivity Disorder (ADHD)**

Profound Intellectual Disability

This diagnostic impression was formulated according to the DSM-5-TR criteria (APA, 2022) and cross-validated with parental interviews and clinical observation data.

Treatment Plan and Intervention

Therapeutic Framework

The treatment approach for Ahmed adopted an eclectic, multidisciplinary framework, combining Applied Behavior Analysis (ABA), Play Therapy, Music Therapy, and Parent-mediated Home Training. The overarching aim was to enhance functional communication, social interaction, and adaptive living skills while reducing hyperactivity and maladaptive behaviors. Therapy sessions were conducted weekly over a period extending from August 2022 to March 2025, allowing for longitudinal tracking of progress.

This multimodal design was grounded in research demonstrating that integrated behavioral and sensory interventions lead to meaningful developmental gains in children with ASD (Esposito et al., 2025; Dijkstra-de Neijs et al., 2023). Family participation was emphasized throughout, as parent-mediated interventions have been shown to enhance generalization of learned behaviors and ensure continuity beyond clinical settings (Gitimoghaddam et al., 2023).

The treatment goals were divided into **short-term (6–12 months)** and **long-term (1–2 years)** targets:

Short-term goals included:

- Increasing sitting span and sustained attention.
- Enhancing the ability to follow single-step commands (e.g., “sit,” “give,” “wave”).
- Promoting basic adaptive behaviors, such as eating and washing hands.
- Reducing hyperactivity, impulsive movements, and stereotypical behaviors.

Long-term goals included:

- Developing expressive and receptive language skills.
- Increasing social engagement through cooperative play.
- Strengthening behavioral self-regulation and executive functioning.
- Preparing for gradual integration into structured educational environments.

Applied Behavior Analysis (ABA)

ABA principles were systematically implemented using Discrete Trial Training (DTT), modeling, and positive reinforcement. Each session consisted of short, structured trials targeting foundational behaviors such as sitting, attending, imitation, and simple command following. Reinforcement strategies included token economies (stickers, toys, clapping) contingent on correct responses or compliance. Prompting and fading techniques were employed to reduce dependency on therapist cues and encourage autonomous behavior.

Maladaptive behaviors, including hand-tapping and pacing, were managed using response interruption and redirection, redirecting the child toward an appropriate task or play activity. Reinforcement schedules were modified as the child demonstrated

improved compliance and engagement. The involvement of caregivers was a key component; parents were trained to continue ABA exercises at home, reinforcing consistency between therapy and daily life. This approach aligns with Esposito et al. (2025), who reported that caregiver-implemented ABA promotes faster skill generalization and more stable behavior maintenance across settings.

Gradually, Ahmed exhibited noticeable progress in attending to commands, reducing self-stimulatory actions, and sustaining brief periods of focused activity. His eye contact, though initially poor, improved when combined with immediate reinforcement and music-supported cues.

Play and Role-Play Therapy

Play therapy was integrated to complement structured ABA tasks, providing a naturalistic context for social and emotional learning. Structured play sessions utilized familiar and engaging materials such as blocks, balloons, color toys, and stuffed animals. Activities such as peek-a-boo, hide-and-seek, and block building were designed to enhance joint attention, imitation, and turn-taking. These activities also stimulated nonverbal communication, emotional expression, and cooperative interaction.

Role-play exercises were introduced progressively, beginning with simple social rituals such as greeting (“Salam”), shaking hands, and pointing to body parts. The therapist used modeling and verbal prompts to encourage participation, followed by positive reinforcement for successful attempts. Over time, Ahmed began to reciprocate greetings and maintain brief moments of shared attention.

Empirical evidence supports that integrating play-based interventions with behavioral strategies increases engagement and expressive communication in non-verbal children with ASD (Dijkstra-de Neijis et al., 2023; Elbeltagi et al., 2023). For Ahmed, play therapy provided a medium for experiential learning, reducing frustration and enhancing emotional connection.

Music and Sensory Integration Therapy

Given Ahmed’s heightened responsiveness to sound and rhythm, music therapy was introduced to regulate sensory input and improve attention. Activities included rhythmic clapping, singing ABC songs, and musical deep-breathing exercises, aimed at synchronizing movement and auditory cues. Music served as a motivational tool to reduce hyperactivity and foster concentration during transitions between tasks.

Sensory integration activities were incorporated to address tactile and auditory sensitivities. These included fidget toys, textured boards, sorting games, flashlight tracking, and pop-up sound toys. Such interventions targeted sensory modulation, helping the child manage arousal levels and engage in goal-directed behavior (Elbeltagi et al., 2023).

At home, the parents implemented a consistent plan involving rhythmic jumping, coloring, object identification, and rhyming games, encouraging skill retention outside therapy. Over time, Ahmed demonstrated improved eye contact, attention span, and willingness to participate. His fidgeting and self-stimulatory behaviors declined notably during later sessions, indicating positive adaptation to structured routines.

Progress and Observed Outcomes

Ahmed’s therapeutic journey demonstrated gradual yet meaningful progress across behavioral, cognitive, and adaptive domains. During the initial phase, he exhibited minimal eye contact, excessive fidgeting, and frequent task avoidance. His sitting span remained under two minutes, and he required constant prompts for basic command following. Hyperactivity and stereotypical hand-tapping were predominant,

aligning with clinical observations of sensory-seeking behaviors in children with profound ASD (Masi et al., 2023).

By the mid-phase of the intervention (around 8–12 months), noticeable improvements were observed. Ahmed began responding to familiar instructions, displayed extended sitting tolerance of up to five minutes, and initiated limited physical interactions such as handshakes. Mood stabilization was evident, and he began showing interest in musical and rhythmic activities, suggesting early sensory regulation. Adaptive skills improved he participated in assisted eating and hand-washing routines, marking a key short-term therapeutic milestone.

During the later sessions (after approximately two years of consistent therapy), Ahmed's social and cognitive engagement increased considerably. He began showing spontaneous smiling, vocalizations during rhymes, and participation in greetings such as "Salam." He responded positively to reinforcement strategies and began independently following one-step commands. His attention span increased significantly, and his emotional regulation improved, with fewer episodes of hyperactivity or task refusal. Although verbal expression remained limited, he displayed enhanced nonverbal communication through gestures, pointing, and eye direction.

The achieved short-term goals included independent eating, consistent response to simple commands, and extended sitting span. Long-term progress was evident in improved adaptive responses, attentional control, and emerging social reciprocity. Prognosis remains fair, contingent upon continued therapy and regular psychiatric follow-up. Early referral to a psychiatrist ensured medical monitoring, particularly for managing hyperactivity and potential comorbidities, thereby supporting an integrated care approach.

Discussion

Ahmed's developmental progression and therapeutic outcomes exemplify the effectiveness of multimodal, individualized interventions in addressing core deficits associated with Autism Spectrum Disorder (ASD). His case reinforces the empirical evidence that early, consistent behavioral and play-based interventions significantly enhance adaptive and communicative functioning in young children with ASD (Esposito et al., 2025; Gitimoghaddam et al., 2023).

The integration of Applied Behavior Analysis (ABA) and play therapy provided a structured yet engaging framework for skill acquisition. As highlighted by Esposito et al. (2025), ABA-based reinforcement techniques promote learning through repeated practice and positive conditioning. In Ahmed's case, ABA principles such as discrete trial training, prompting, and fading effectively improved command following and attentional control. The parallel use of play and music-based therapy capitalized on intrinsic motivation, fostering emotional expression, social reciprocity, and sensory integration domains often underdeveloped in children with profound ASD (Dijkstra-de Neijs et al., 2023; Elbeltagi et al., 2023).

Moreover, the inclusion of parent-mediated training was critical in reinforcing skill generalization. Parents replicated ABA and play routines in the home environment, aligning with findings that caregiver involvement significantly enhances long-term maintenance of learned behaviors (Wong et al., 2024). Such family participation also improved emotional bonding and reduced parental stress, an often-overlooked aspect of ASD intervention.

In Pakistan's collectivist and resource-limited context, culturally responsive and family-centered interventions are particularly valuable. As noted by Khan et al. (2024), adapting evidence-based methods to local settings ensures sustainability and

accessibility. Training caregivers in basic reinforcement and play strategies empowers families to continue therapeutic practices beyond the clinic, bridging service delivery gaps in low-resource regions.

Overall, this case underscores the multidimensional and developmental nature of ASD intervention, where behavioral, sensory, and emotional domains must be addressed concurrently. Ahmed's positive progress despite profound impairment suggests that structured, individualized, and culturally adapted therapeutic models rooted in ABA and play-based frameworks can yield meaningful developmental gains, even in complex neurodevelopmental presentations.

Conclusion

The case of Ahmed Khazir highlights that structured behavioral and play interventions, when sustained over time, can yield meaningful improvements in children with severe ASD. The combined use of ABA, play, music, and parental reinforcement enhanced adaptive behavior, emotional regulation, and social engagement.

Future directions include introducing augmentative communication systems (PECS or visual aids), structured early schooling, and continued psychiatric collaboration for hyperactivity management. The findings underscore the need for culturally adapted early intervention frameworks for children with ASD in Pakistan and similar low-resource contexts.

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