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Parent-Mediated Home-Based Behavioural Intervention for a Preschool Child with Autism Spectrum Disorder: A Single-Case Intervention Study

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ABSTRACT:

Background: Parent-mediated behavioural interventions have become an evidence-based and cost-effective intervention for developmental outcomes in children with Autism Spectrum Disorder (ASD). Studies on individualised home-based parent training (IHP) programs in the Indian setting, however, have been scarce, especially for preschool children with mild intellectual disability. Allowing parents to be primary interventionists can increase the intensity and sustainability of early intervention and improve child outcomes in natural home environments.

Objective: This case study aimed to assess the effectiveness of a 16-week parent-mediated behavioural intervention for improving developmental functioning, adaptive behaviour, severity of autism symptoms, sitting tolerance, imitation skills and following simple one-step instructions in a preschool child with a diagnosis of mild intellectual disability and mild ASD.

Method: A single case pre & post test design with baseline behavioural recordings was used. One mother was given weekly 45 minute sessions with a clinician who worked on behaviour management strategies, such as environmental restructuring, functional behaviour analysis, modelling, prompting and systematic use of primary and differential reinforcement. Progress in behaviour was monitored on a daily basis at home using daily monitoring sheets. Developmental outcomes were measured by Developmental Screening Test (DST), adaptive functioning was measured by Vineland Social Maturity Scale (VSMS) and autism severity was measured by Indian Scale for Assessment of Autism (ISAA). Baseline and 4-weekly behavioural targets were assessed, and standardised reassessed at 16-weeks.

Results: In all targeted behaviours, there was improvement over time. These included improved sitting tolerance from some 10sec to 4- 5 min; was able to imitate simple motor tasks and, with minimal cues, was able to listen to verbal instructions and act on them. The intervention resulted in improvement of the Developmental Quotient (DST: 51 to 60), Social Quotient (VSMS: 54 to 58), and reduction in the autism severity (ISAA: 102 to 88) as demonstrated by the standardized assessments.

Conclusion: There is a positive effect of structured parent-mediated behavioural intervention, which can lead to meaningful observable changes in developmental functioning, adaptive behaviour, and autism symptom severity in young children

diagnosed with ASD when delivered regularly in a home setting, as suggested in this case study. The model of evidence-informed early intervention services via the parent as primary interventionist is feasible, low cost, and culturally relevant and could expand access to these services in resource-limited contexts.

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder with core deficits in social communication and social interaction symptoms, as well as restricted, repetitive patterns of behavior, interests or activities (American Psychiatric Association [APA], 2022). The disorder begins in early childhood and impacts a variety of developmental areas, such as language, cognition, adaptive behaviour, emotional regulation and social functioning. Children with ASD have a wide range of symptom severity and developmental course, so individualised intervention is necessary. ASD is a growing public health issue worldwide due to its widespread prevalence and lifelong effects on those affected, their families, the education system, and healthcare services. Although the prevalence of ASD varies across different countries based on how ASD is defined, the number of children diagnosed with ASD ranges from one in 100 children to one in every 300 to 600 children (Lord et al., 2020; Zeidan et al., 2022). Increased awareness and better diagnostic practices have led to more children being diagnosed with ASD in India, but delayed diagnosis and lack of access to evidence-based interventions are prevalent, especially in rural and resource-limited areas (Indian Academy of Paediatrics [IAP], 2017).

It is well established that early recognition and intervention are fundamental in the successful management of autism. The first 5 years of life are a time of accelerated brain growth when the brain is most vulnerable to environmental influences and learning. Interventions that begin at this critical developmental window have shown profound positive effects on communication, cognition, adaptive behaviour and social participation (Dawson et al., 2010; Zwaigenbaum et al., 2015). This means that international clinical guidelines suggest that intervention starts as soon as possible after the first developmental signs are noticed, and not after a formal diagnosis (National Institute for Health and Care Excellence [NICE], 2021). Similarly, the Indian Academy of Pediatrics emphasizes that intervention must be comprehensive and initiated as early as possible and that families must play an active role in the intervention process (IAP, 2017).

Even if applied behaviour analysis (ABA) is a method that has long been used, it is one of the most researched and evidence-based interventions for children with ASD (Steinbrenner et al., 2020). ABA uses principles of learning theory and evidence-based strategies and procedures that include reinforcement, prompting, shaping, modelling, task analysis, stimulus control, and generalisation to improve adaptive behaviour and decrease behaviours that interfere with learning. Contemporary behavioural interventions focus not just on teaching by the therapist, but also on the acquisition of functional skills in natural settings, which enables maintenance and generalization to home, school, and community settings (Schreibman et al. 2015).

Parent-mediated interventions have been emphasized as an effective approach to early autism intervention over the past 10 years. Parent-mediated intervention is a structured intervention programme, where clinicians teach parents to use evidence-based behavioural strategies within their normal daily interactions with their child. Parents spend a lot more time with their children than do therapists and are thus well suited to provide intensive, consistent, naturalistic intervention. In addition to increasing intervention intensity, training parents also has the potential to increase the likelihood of their learned skills being generalised, enhance parent-child relationships, boost parental confidence, and decrease the long-term cost of therapist-intensive services (Bearss et al., 2015).

Systematic review results are strong and indicate that parent-mediated interventions are effective. In a Cochrane systematic review, Oono et al. (2013) found that parent-mediated intervention improved parent-child interaction, communication, and language development, and resulted in small improvements in severity of autism symptoms. Likewise, the Preschool Autism Communication Trial (PACT) showed that structured parent coaching resulted in lasting decreases in the severity of autism symptoms after long-term follow-up, in addition to improvements in parent-child communication (Green et al., 2010; Pickles et al., 2016). The results indicate that structured clinician-guided parent training is a viable way to provide therapeutic opportunities beyond the clinical setting in the home.

Further evidence of the importance of caregiver involvement has been supported by Naturalistic Developmental Behavioural Interventions (NDBIs). Schreibman et al. (2015) defined NDBIs as evidence-based methods that combine developmental science and behavioural learning theory to support social communication, play, imitation and adaptive functioning in natural environments. Likewise, the Early Start Denver Model (ESDM), developed by Rogers and Dawson (2010), combines developmental and behavioural strategies through play-based parent participation and has demonstrated significant improvements in cognitive, language, and adaptive functioning among young children with ASD (Dawson et al., 2010; Rogers et al., 2012).

The study by Kasari et al. has also underscored the need to focus on caregiver-mediated interventions that address joint attention, symbolic play, and social engagement. Children who received parent-implemented interventions showed significantly more improvement in spontaneous social communication, adaptive functioning and engagement in daily activities in their randomised controlled trials (Kasari et al., 2010; Kasari et al., 2015). Likewise, Bearss et al. (2015) reported that parent coaching was more effective than parent education alone in decreasing disruptive behaviours and increasing competence of caregivers with structured coaching, and that active behavioral coaching allows parents to carry out more intervention strategies in natural settings with greater fidelity.

Caring for an autistic child has also been recognised as important in autism intervention by international organizations. NICE (2021) suggests individualised intervention programmes and especially encourages parent involvement in supporting their child's communication, social interaction, adaptive behaviour, and emotional regulation. Similarly, the World Health Organisation (WHO, 2022) has created a Caregiver Skills Training (WHO-CST) programme to help caregivers in low-resource areas put evidence-based developmental and behavioural strategies into practice. The feasibility, acceptability and effectiveness of the WHO-CST programme has been shown in various studies, which have pointed to improvements in caregiver competence, in children's communication, in adaptive behaviour and in the overall well-being of the family, especially in LMICs (Divan et al., 2019; World Health Organisation, 2022).

In India, evidence for parent-mediated intervention has gradually grown, albeit rather limited, in comparison to Western nations. The majority of the Indian studies have been on group parent education, psychoeducation, or feasibility programmes but not on home-based individual behavioural coaching supervised by clinicians. Divan et al. (2019) highlighted the need for caregiver-mediated interventions to address the lack of qualified personnel and access to early intervention in low-resource communities. In addition, implementation research with the WHO-CST programme in India has shown positive changes in caregiver knowledge, intervention fidelity, and child developmental outcomes, indicating the feasibility and cultural acceptability of structured parent training. Although some of these results are promising, there are still some areas of literature that are lacking.

There are only a few Indian studies that have specifically and systematically investigated individualised parent-mediated behavioural interventions (IPMI), with the use of standardised developmental assessments and direct behavioural outcome measures. Furthermore, there is little research that exists about structured clinician-supervised home-based programs that address basic developmental skills, including sitting tolerance, imitation and following simple directions, in preschool children with co-occurring ASD and ID.

Therefore, the aim of the present case study was to assess the effectiveness of a structured 16-week parent mediated behavioural intervention delivered by weekly clinician coaching and daily home-based practice with a preschool child with mild ASD and mild ID. The intervention included elements of behaviour such as functional behaviour assessment, modelling, prompting, environmental restructuring, differential reinforcement, and systematic home monitoring. Developmental functioning, adaptive behaviour and autism symptom severity were assessed using Developmental Screening Test (DST), Vineland Social Maturity Scale (VSMS) and Indian Scale for Assessment of Autism (ISAA) throughout the intervention, and behavioural outcomes were assessed during the course of intervention were assessed as sitting tolerance, Imitation skills, following simple one-step instructions.

1 Present Study and Methodology

The present study aimed to evaluate the effectiveness of a structured parent-mediated behavioural intervention in improving developmental functioning, adaptive behaviour, autism symptom severity, sitting tolerance, imitation skills, and the ability to follow simple one-step instructions in a preschool child diagnosed with Autism Spectrum Disorder (ASD). A single-case pretest-posttest research design with repeated behavioural observations was adopted to evaluate the effectiveness of the intervention.

This study sought to assess the effectiveness of a structured parent-mediated behaviour intervention on the developmental functioning, adaptive functioning, symptom severity of autism, sitting tolerance, imitation, and following simple one-step directions of a preschool child diagnosed with Autism Spectrum Disorder (ASD). A single case pretest-posttest research design with repeated behavioural observations was used to assess the effectiveness of the intervention. The participant was a 3 years, 5 months old boy with a recent clinical diagnosis of Mild Autism Spectrum Disorder (ASD) with Mild Intellectual Disability (ID) from a multidisciplinary clinical team. The developmental evaluation was done at baseline using standardised psychometric tools as Developmental Screening Test (DST), Vineland Social Maturity Scale (VSMS) and Indian Scale for Assessment of Autism (ISAA). The mother of the child then completed a structured 16-week Parent Management Training (PMT) programme, which included 45-minute weekly, clinician-supervised sessions. Emphasis was placed on home practice, positive reinforcement, differential reinforcement, functional behaviour analysis (ABC model), environmental restructuring, modelling, prompting and cueing. The mother provided progress monitoring of targeted behaviours on daily behavioural recording sheets. Standardized reassessment was conducted following the intervention to assess changes in autism symptom severity, adaptive behaviour and developmental functioning.

1.1 Chief Complaints

The parents brought the child to the clinic with concerns that he was having a delay in his speech, language, and communication development and his social interaction. Parents said the child had minimal eye contact, was not responding to his name, had delayed expressive language, was not following simple verbal instructions, was not imitating, and was not staying in a chair while learning structured activities. They also reported that they interacted less with family members and peers, preferred solitary play, were less interested in activities suited to their age, and had poor attention and concentration. The child's problems with behaviour were affecting participation in daily routines and in the early learning activities, and the family requested an evaluation and intervention from a professional.

1.2 Case History

Parental reports indicate that developmental issues were observed at 2 years of age as the child was not meeting the expected milestones in speech and social communication. Gross motor development occurred in the normal age range, but there was a marked delay in expressive language development. The child had limited social reciprocity, inconsistent eye contact, less responding to social cues, and little initiating social interaction with caregivers. He demonstrated a lack of imitation of verbal and motor behaviors, and also had some difficulty grasping and executing simple instructions. Repetitive play patterns, limited interests, and limited flexibility in routine were also noted by parents when observing their child's behavior in changes in routine. With age, the behavioral traits started to become more apparent and began to negatively impact his adaptive functioning at home. A child has been referred for a full psychological assessment and early behavioural intervention following developmental assessment by rehabilitation staff.

1.3 Developmental History

The child was born to non-consanguineous parents following an uncomplicated pregnancy and delivery. There were no significant ante-, peri-, or post-natal complications reported. Developmental gross motor skills, such as head control, sitting unaided, crawling, standing and walking independently, were within acceptable developmental limits. There were, however, some delays in speech, language, and social developmental areas. The child's acquisition of meaningful speech was delayed, with reduced communication intent, low social reciprocity and limited engagement in interactive play. According to parental reports, difficulties in social communication became increasingly prominent during the preschool years, while motor skills remained relatively well preserved.

1.4 Psychological Assessment

A thorough psychological evaluation was drawn up prior to commencement of intervention. Developmental functioning was measured with the Developmental Screening Test (DST) developed by Bharat Raj, which gives an estimate of Developmental Age (DA) and Developmental Quotient (DQ). The Vineland Social Maturity Scale (VSMS) by Doll was used to assess adaptive behaviour and social maturity in terms of functioning in the following domains: self-help, communication, locomotion, occupation, and socialisation. Symptom severity of autism was evaluated using the Indian Scale for Assessment of Autism (ISAA) developed by the National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID). In

addition to the standardised assessment, detailed clinical observation and parent interviews were carried out to determine the intervention priorities, developmental needs and behavioural strengths.

1.5 Test Findings

The child's chronological age (CAA) at the baseline assessment was 3 years and 5 months. The Developmental Screening Test showed a Developmental Quotient (DQ) of 51 or a Developmental Age of 1 year and 9 months, indicating that there was mild developmental delay. The Vineland Social Maturity Scale reported the following Social Quotient (SQ) = 54, Social Age (SA) = 1 year and 10 months, indicating delayed adaptive functioning and social maturity. Assessment with the Indian Scale of Assessment of Autism (ISA) showed a score of 102, which was considered as mild Autism Spectrum Disorder. The results indicated that there was considerable delay in communication, imitation, adaptive behaviour, and social interaction, although gross motor functioning was relatively good.

1.6 Behaviour Observation

During the assessment sessions, the child had only occasional eye contact and needed to be prompted a number of times to attend to the examiner. Hard to follow verbal instructions, and attention span during structured tasks was very limited. The sitting tolerance was low, and the child was able to sit independently for about 10 seconds before leaving the activity at baseline. There were no motor imitation skills, and the child couldn't imitate simple gestures without additional prompting. He also had trouble taking one step verbal directions and needed to be propped up for tasks during structured situations. No aggressive or self-injurious behaviour was found on the assessment, but the child engaged in few spontaneous social interactions and had a preference for solitary engagement. These observations were concordant with the standardised assessment results and helped to prioritise intervention targets.

1.7 Provisional Diagnosis

The child was diagnosed with Mild Autism Spectrum Disorder (ASD) with Mild Intellectual Disability (Intellectual Developmental Disorder) based on the detailed developmental history, parental interview, behavioural observation and standardised psychological assessment. On baseline assessment, developmental functioning, adaptive behaviour, communication, imitation and social interaction were found to be delayed. Results confirmed the importance of intensive early intervention with active parent involvement. As such, a highly structured 16-week Parent-Mediated Behavioural Intervention Programme was designed to increase developmental skills, adaptive functioning, and decrease the severity of symptoms of autism via a clinician-led home-based behavioural management programme.

1.8 Parent-Mediated Behavioral Intervention Programme (PMBIP)

Following the baseline assessment, a structured Parent-Mediated Behavioral Intervention Programme (PMBIP) was introduced to enhance three core behaviour areas: (a) sitting tolerance, (b) imitation skills and (c) following simple 1-step instructions. The intervention was designed to follow the principles of behavior and was implemented by the child's mother, with weekly clinician-supervised parent coaching sessions. The mother received one 45-minute training session weekly and was systemically trained to implement behavior intervention strategies in the typical home setting of the child. There were 4 sessions that included demonstration of techniques, role play, supervised practice, discussion of difficulties with home implementation, and planning for activities for the following week. The focus of the intervention was on parent competency, treatment fidelity, consistency of implementation, and generalization of skills into everyday routines. The intervention was based on the following protocol.

1.8.1 Environmental Restructuring and Baseline Recording

The intervention began with restructuring the child's environment, with the goal of creating a whole, structured, predictable, distraction-free learning environment that would help the child focus, engage, and learn new skills. The mother received training during the first parent training session to identify a specific area in the home where behavioral training could be carried out daily. The selected area was organized to reduce competing sensory input by turning off the TV, keeping mobile phones out of the area, removing unnecessary toys and household items, and not interrupting the child by other family members. Only materials needed for the activity scheduled (such as picture cards, toys, blocks, reinforcement items, and visual aids) were placed within the child's reach for increased attention and task engagement.

The mother was also instructed to use intervention times daily at the same time to develop a daily schedule and enhance the child's readiness to learn. Systematic baseline recordings were collected for each targeted behavior to establish the child's starting point for behavior before the behavior intervention was implemented. In structured activities, the mother was asked to watch and note the child's spontaneous performance without reinforcement and without heavy prompting. The three main intervention targets of the baseline were: sitting tolerance, imitation skills, and following simple one-step instructions. Structured home-recording sheets were used to record duration of sitting, level of assistance needed, level of accuracy of imitation, and verbal instructions given.

For example, during the baseline assessment of sitting tolerance, the child was asked to sit on a chair and engage in a simple table-top activity involving matching picture cards. Without any behavioural support, the child remained seated for only approximately 10 seconds before leaving the chair and attempting to engage with unrelated objects in the room. Similarly, when the mother demonstrated a simple action such as clapping her hands and instructed the child to "Do this," the child was unable to imitate the action independently. Likewise, when presented with a familiar instruction such as "Give me the ball," the child did not respond consistently and required repeated verbal and physical guidance. These baseline observations confirmed significant deficits in sustained attention, imitation, and receptive language skills and served as objective reference points for evaluating behavioural changes throughout the 16-week intervention programme.

1.8.2 Functional Behaviour Assessment (ABC Analysis)

In the first stage of parent training, the functional behaviour assessment (FBA) with the Antecedent–Behaviour–Consequence (ABC) model was introduced to help the mother recognise factors that influence the child's behaviour within their home setting. The mother was instructed to systematically observe and record the events that took place just prior to the behaviour (antecedent), the child's observable response (behaviour), and the response or outcome from the environment (consequence). This structured recording was used to identify behaviour patterns, to make a sensible guess about the likely function of the inappropriate behaviour, and to help choose the individual behavioural intervention strategies.

At baseline observation, for instance, when the mother would say to the child, "Sit on the chair" as part of a structured learning activity, the child would sit in the chair for around 10 seconds before getting off the chair and moving around the room. Using a table-top learning task, the behaviour was being left behind, and the consequence was that the mother tended to stop the activity or accompany the child to get him to come back. This pattern of caregiver response may have inadvertently allowed the child to escape from or avoid the learning activity. Based on the findings of the functional analysis, specific components of the intervention were modified to address this pattern. These modifications included presenting tasks of shorter duration, providing immediate positive reinforcement for remaining seated and engaged, gradually increasing the duration of sitting, and consistently redirecting the child when attempts were made to escape from the task. Through the systematic implementation of these strategies, the child's sitting tolerance was gradually increased over the course of the intervention period.

ABC analysis was also used in the case of following simple instructions. In the baseline phase, when the mother said a familiar command, e.g., "Give me the ball," the child often failed to follow the instructions and play on his own. It was observed that verbal prompts and, subsequently, some physical prompts were given repeatedly with little reinforcement of independent responses. After functional analysis, the mother was instructed to give one clear cue while keeping the child's attention, give an appropriate cue when necessary, and reinforce any independent or cued responses with verbal praise and preferred reinforcement as soon as they occurred. This systematic procedure enabled the child to follow easy verbal directions and diminish his reliance on repeated prompts.

The weekly parent coaching sessions allowed the clinician and mother to review the ABC recording sheets, identifying behaviours that triggered meltdowns and assessing the effectiveness of the behaviour intervention strategies, and making modifications based on the data. The use of functional behaviour assessment was therefore important in the intervention as it enabled the use of individual behavioural management strategies based on the child's observed behaviour patterns rather than making general assumptions.

1.8.3 Behaviour Modification Techniques

The core of the Parent-Mediated Behavioural Intervention Programme comprised behavioural modification, and it is carried out using evidence-based behavioural principles to increase adaptive behaviours and decrease behaviours that interfere with learning. In the first period of intervention, the mother was trained to identify highly motivating stimuli for the child by

conducting a reinforcer preference assessment. Direct observation of the child and parent interviews were conducted to gather information on the child's preferred food, favourite toys, sensory activities, play materials and social rewards. A reinforcement hierarchy was created to maximize the individual's motivation and learning based on the child's preferences and was included in the intervention programme.

The mother was then trained to use the correct method of positive reinforcement and focus on providing reinforcement as soon as the desired behaviour was observed. At first, small amounts of the child's favourite food snack or access to a favourite toy were used to teach newly emerging behaviours. These tangible rewards were always accompanied by social reinforcement like cheering, verbal praise ("Very good!" or "Excellent sitting!"), smiling, clapping, high fives, and loving physical touches to help strengthen the link between successful performance and positive consequences.

For instance, in the sitting tolerance training, a child could first sit for about 10 seconds and then try to get out of the activity area. The mother was asked to prompt her child with the word "good" right after her child sat for the desired time, as well as a preferred edible reinforcement. The frequency of tangible reinforcement was gradually lowered as this criterion was systematically increased from 10 seconds to 30 seconds, 2 minutes, and 4–5 minutes, as the child's sitting tolerance slowly increased. The graduated reinforcement schedule was useful in maintaining and reinforcing the engagement of students in the structured learning activities while not over-rewarding them for their efforts.

Similarly, during the imitation training, each instance of imitative action (e.g., clapping hands, waving goodbye, touching body parts) was given praise, clapping, and access to preferred play activities immediately following the action. Initially, reinforcement was presented after each correct response (continuous reinforcement) to help with the acquisition of the skill. Once the child became more consistent, the reinforcement was gradually changed to intermittent reinforcement: the child was rewarded after a few correct responses instead of every response. This was a procedure that helped to maintain the learnt behaviours and improved their generalization across activities and settings.

Simple one-step instructions were also used with behaviour modification techniques. For verbal instructions given (e.g., "Give me the ball" or "Come here"), the mother responded quickly and enthusiastically with social praise and access to a preferred activity. When the child did not respond independently, prompts were provided according to a least-to-most prompting hierarchy, with the level of assistance gradually increased only when necessary. Immediate positive reinforcement was provided following successful task completion to strengthen the desired response and promote greater independence. This method reinforced the connection between the appropriate behaviour and/or the positive consequences and gradually expanded the child's independent responding.

Reinforcement procedures were individualized throughout the intervention based on the child's progress and motivation needs. Frequent weekly clinician-supervised coaching sessions provided a consistent reinforcement rate, maintained appropriate timing of reward delivery, and systematically faded tangible reinforcers as the child's behaviours became more appropriate. The child showed improved behaviour during structured activities, sitting tolerance, imitation skills and adherence to one step directions by end of the 16 week intervention programme, demonstrating effectiveness of behaviour modification in the natural home environment.

1.8.4 Modelling and Demonstration

Modelling was a crucial part of the intervention programme and was used systematically to help to teach imitation, attention, eye contact, and receptive developing communication skills. The clinician first modeled the target behaviour to the mother with live demonstrations and guided practice during each weekly parent coaching session. The mother then practiced the same behaviour patterns with direct supervision until she was competent in carrying out the procedures at home without supervision. Special efforts were made to keep the child's attention before giving any instruction, to keep the verbal instruction to a minimum, and to make clear, slow, and developmentally appropriate demonstrations.

The mother was initially instructed to get the child's attention and eye contact before presenting an eye contact or verbal instruction during the baseline assessment, as the child displayed poor eye contact and attention during this process. She was told to stand at the child's eye level and gently call the child's name and then hold a very desirable toy or object near her face to promote the child's natural eye orientation. Any spontaneous eye contact was reinforced with pressing "likes" and smiles and access to a preferred reward immediately after the first gaze contact, even for only 1 to 2 seconds. For instance, before the mother asked the child to "clap his hands," she placed her child's favorite toy close to her face and waited for the child's brief

glance toward her face before the child was asked to clap his hands. After eye contact was made, she would smile, comment on the child (e.g., “Good looking!”), and would immediately model the target action. This approach incrementally shifted the child's focus to the mother and enhanced their readiness to learn.

After the child's attention skills had been established, modelling procedures were introduced to facilitate the development of imitation skills. Initially, the mother demonstrated simple gross-motor and object-based actions, such as clapping hands, waving goodbye, raising both hands, touching the head or nose, and placing blocks into a container. Each action was accompanied by a brief verbal instruction, such as “Do this,” to provide a clear and consistent cue for imitation. If the child was unable to imitate the action without assistance, prompts were given in the order specified in the prompting hierarchy, and systematically faded as the response was performed with increasing correctness. All successful imitations were immediately reinforced with verbal praise, social reinforcement, and preferred rewards.

Modelled behaviours were progressively increased in complexity to the child's learning speed. After the child regularly repeated single motor activities, their participation in more functional daily activities was introduced, including giving an object, pointing to familiar body parts, placing toys into a box, and responding to simple play routines. Activities of daily living were also used to model for generalization of learned behaviors in natural home environments. The mother was encouraged to model consistently throughout the intervention during play, at the table, when dressing, and during everyday household activities to provide multiple opportunities for learning in the child's daily environment.

Systematic use of modelling and demonstration was observed to have a positive effect on the child's ability to imitate as well as allowed sustained attention, eye contact and engagement during structured activities as well as responding to social interaction. These enhancements helped set the stage for developmental progress in learning to follow one-step instructions and participating in learning activities with parents.

1.8.5 Picture Exchange Communication System (PECS)

Some strategies from the Picture Exchange Communication System (PECS) were included in the intervention programme to help with receptive language, attention and understanding of simple one-step instructions. Picture-based visual supports were not used as a whole language programme of communication, but were incorporated into structured learning activities to take place in the home to accompany verbal directions and to reduce the child's reliance on repeated verbal directions. The mother was trained to show the simple picture cards that represent familiar objects, routine instructions, and everyday activities, before giving verbal commands. The multimodal presentation was used to create an association between visual and spoken language and helped the child to understand and participate in tasks.

The child had great difficulty following verbal directions and often would not respond to simple directions with repeated verbal and physical prompting. To solve this problem, the mother brought picture cards of everyday objects: ball, cup, spoon, blocks, favourite toys, as well as action cards, which are cards with pictures of common activities such as sit, stand, clap, give, and come. For instance, the mother was teaching a lesson that was “Give me the ball,” and at the same time showed the picture of a ball, pointed at the ball, and gave the verbal instruction. Immediately, when the behaviour was successfully completed (when the child gave up the ball), they received enthusiastic verbal praise and access to a preferred reward. The picture cues were then gradually faded as the child became more familiar with the visual cues, allowing the child to come to increasingly rely on verbal cues.

Likewise, visual supports using PECS were integrated into structured table-top activities to enhance task engagement and sitting behavior. A visual schedule of the sequence of activities was introduced before each activity, and the mother demonstrated one of the activities each time. The visual sequence enabled the child to look forward to the activity, decreased avoidance of the task, and increased involvement in the intervention sessions.

The child's ability to follow simple one-step instructions improved over time as demonstrated by the behavioural outcome measures. He was not able to follow simple verbal instructions without assistance at baseline. He only required repeated modelling, both physically and verbally, by Week 4, and minimal physical and verbal prompting by Week 8 to follow simple one-step verbal instructions, and by the end of the 16-week intervention, he followed simple one-step verbal instructions with minimal or no additional prompting. Use of visual supports using the PECS system in conjunction with behavioural reinforcement, modelling and systematic prompt fading was seen to support language comprehension and understanding of task expectations and to enhance participation in daily home-based activities independently.

1.8.6 Prompting Hierarchy

A hierarchy of prompts was used systematically throughout the intervention to assist in the acquisition of skills and to gradually increase independent skill performance. At first, most of the targeted activities had to be done for him physically by a staff member since he was not able to understand or perform the desired behaviors independently. In sitting training, the mother would encourage him to sit without getting up from the chair and gently move him back to sit when he tried to go away from the sitting training area. Similarly, when the mother was imitating the child, she helped the child simply with her hands: clap both hands, raise both hands, or touch body parts.

The level of assistance was reduced over time as the child learnt more about the intervention activities; the physical prompts were slowly withdrawn, with only the minimum being used to get the child to either start or finish responses. The mother, for example, would lightly touch the child's elbow or wrist to help the child move, rather than holding his/her hand completely. Partial physical support was provided only when the child could not follow verbal commands during instruction-following tasks.

Later, gestural cues were added, suggesting an object to be located, an action to be performed, or simple gestures to signal a response. For instance, the mother would face the ball while at the same time reaching out for the child to respond independently when giving her the ball.

Within the intervention, verbal prompts were used more and more as the intervention progressed. The mother gave short, simple, and consistent verbal directions (e.g., sit down, clap hands, stand up, give the block), giving the child enough time to respond before giving further assistance. Additional pictorial supports such as picture cards and object demonstration (PECS) were added to provide extra opportunities to promote understanding during structured activities. These visual supports were used to assist the child to understand what was expected of him/her to do, to focus on the activity, and to avoid excessive verbal reminders.

Prompts were gradually faded systematically throughout the intervention based on the child's accuracy and consistency in responding. Immediate reinforcement was given on successful responses to enhance independent responses. At the latter part of the intervention, the child was able to sit longer, imitate basic motor movements, and perform single-step verbal directions with occasional verbal directions or gestures. The behaviours targeted were successfully faded, and functional learning occurred in the natural home environment at the end of the 16-week intervention programme when many behaviours were performed independently.

1.8.7 Home-Based Practice Schedule

Home-based practice at home was an integral part of the Parent-Mediated Behavioural Intervention Programme, and it offered the child multiple opportunities to practise newly learned skills in his natural environment. After each weekly parent coaching session, the mother applied individual intervention activities at home as recommended by the clinician. Behaviours were introduced into the child's daily schedule with a regular, systematic approach, thus encouraging skill generalization, consistency of learning, and functional independence, which transcended formal therapy sessions.

The mother went through 3-5 short intervention sessions per day, each between 10-15 minutes, depending on the child's attention span and how much he/she interacted. Short and structured sessions (lessons) were preferred rather than long teaching sessions to reduce fatigue, keep motivation, and reduce behavioural resistance. These three main intervention goals (increasing sitting tolerance, strengthening imitation skills and increasing adherence to single-step instructions) were practiced multiple times in various situations during the day.

At mealtimes, the child was asked to sit down and not get up during the activity, for example. The first step was to reinforce the child for holding a sitting position for brief periods and then to increase the duration of sitting until reinforcement was given. Imitation skills were encouraged during play activities in fun games for clapping hands, stacking blocks, rolling a ball, putting toys into containers, waving goodbye, and touching body parts. On every successful attempt, the child was verbally praised, smiled at, or given a preferred toy. The mother gave opportunities for simple one-step requests during the daily activities of the home, e.g., "Give me the spoon," "Bring the ball," "Put the toy in the box," "Come here, and "Close the door. As the child's understanding and ability to respond independently improved, verbal prompts were systematically faded to promote independent responding and reduce reliance on external cues.

Visual supports and modelling techniques were used as needed to help the child understand and to keep him engaged. The mother was encouraged to use naturally occurring situations throughout the day as learning opportunities as opposed to structured teaching situations. She, for example, encouraged the child to 'Give your shirt' when she was getting dressed, 'Take the cup' when she was eating the snack, and 'Roll the ball to mummy' when the child was playing. These everyday interactions allowed for multiple opportunities to practice receptive language, attention, imitation, and adaptive behaviours within meaningful contexts.

The mother maintained a structured daily home-recording sheet to document the child's progress and response to the intervention. The record included the duration of sitting tolerance, level of prompting required, motor imitation attempts, verbal instructions followed, and type of reinforcement provided. These daily records were reviewed during weekly clinician-supervised sessions to monitor behavioural progress, assess the consistency and feasibility of intervention implementation, identify any challenges encountered at home, and make necessary modifications to the intervention in accordance with the child's changing needs.

The involvement of behavioural intervention in the family's normal activities allowed for high treatment intensity without added expenses for the family or disruption to family life. Repeated practice across natural settings supported maintenance and generalization of newly acquired skills outside of teaching sessions. The home-based practice schedule implemented consistently over the 16-week intervention period was an important factor in the child's sequential improvements in tolerance for sitting, ability to imitate, receptive language, adaptive functioning, and participation in daily activities.

1.8.8 Weekly Parent Coaching and Monitoring

Clinician-supervised weekly coaching sessions were held to ensure fidelity of treatment and to offer ongoing professional feedback. At the end of each session, the mother's home-recording sheets were checked, behavioral progress was discussed, and problems with implementation were addressed, with intervention procedures being changed in some sessions if needed.

The clinician gave appropriate feedback related to reinforcement timing, prompting strategies, environmental set-up, modelling, and behavior management. According to the parents, issues were discussed with them during home implementation, and strategies were tailored to each child's problems and improved upon.

Formal behavioral assessments were done at Weeks 4, 8, 12, and 16 to assess changes in sitting tolerance, imitation skills, and following simple 1-step instructions. Standardization was done at the end of the 16-week intervention programme using the Developmental Screening Test (DST), Vineland Social Maturity Scale (VSMS), and Indian Scale for Assessment of Autism (ISAA) to assess changes in developmental functioning, adaptive behaviour, and autism symptom severity.

As a whole, the Parent-Mediated Behavioral Intervention Programme focused on promoting the mother as the main interventionist using evidence-based behavioral management skills that can be applied in the child's natural home setting. Structured clinician supervision, systematic behavioral techniques, ongoing home practice, and regular progress monitoring led to a progressive improvement in developmental and adaptive functioning and to generalization of the learned skills into the natural environment.

1.9 Ethical Considerations

The current research was done following internationally accepted ethical principles in research involving human subjects. All the appropriate Institutional Ethics Committees have granted ethical approval before the commencement of the study, as per the institutional policies and national guidelines. The child's parent was provided with the purpose of the study, the procedures of the study, the potential for the study, and that the study will be a voluntary process, and written informed consent was taken prior to participation.

The parent received information regarding the child's right to opt out at any time, without repercussions to the child's treatment. All intervention procedures were non-invasive and planned to guarantee the safety, comfort, and well-being of the child during the intervention time. All clinical records and research documents were stripped of any personally identifiable information, and confidentiality and anonymity were maintained at all times. All information has been reported only for scientific and educational purposes, and the identity of the child has been protected by anonymized data.

2 RESULTS AND DISCUSSION

2.1 Table 1

Developmental Screening Test (DST): Comparison of Developmental Milestones Before and After the 16-Week Parent-Mediated Behavioral Intervention

Pre-Intervention (Baseline Assessment)	Post-Intervention (After 16 Weeks)
Unable to name familiar objects from pictures (DST Item 27).	Able to name familiar objects from pictures independently (DST Item 27).
Unable to identify body parts on request (DST Item 28).	Able to identify body parts correctly on verbal request (DST Item 28).
Unable to follow simple functional commands appropriately (DST Item 29).	Able to follow simple functional commands with minimal prompting (DST Item 29).
Unable to perform developmental skills expected beyond the current developmental age.	Achieved an additional developmental milestone by successfully performing DST Item 32, indicating progress to a higher developmental level.
Developmental Quotient (DQ) = 51	Developmental Quotient (DQ) improved to 60

The table above shows the results of the Developmental Screening Test (DST) indicating clinically significant improvement after the 16 week Parent-Mediated Behavioral Intervention Programme. Child's DQ rose from 51 to 60 at post-intervention with an increase in Developmental Age from 1 year 9 months to 2 years 3 months. These results suggest that there was measurable progress in development over the course of the intervention and that the systematic parent-mediated behavioral training affected the developmental course of the child.

One of the most significant enhancements was successful mastery of DST Item 27, which was not met during the baseline assessment. Achievement of this developmental step means that the child has demonstrated progress in his/her developing receptive and expressive developmental skills. The improvement is likely to be because of repeated interaction between parent and child, structured modelling, positive reinforcement, and consistent practice opportunities in the natural home environment. These behavioral strategies were integrated into children's routines, which likely helped to improve their attention, learning readiness and ability to learn new developmental skills.

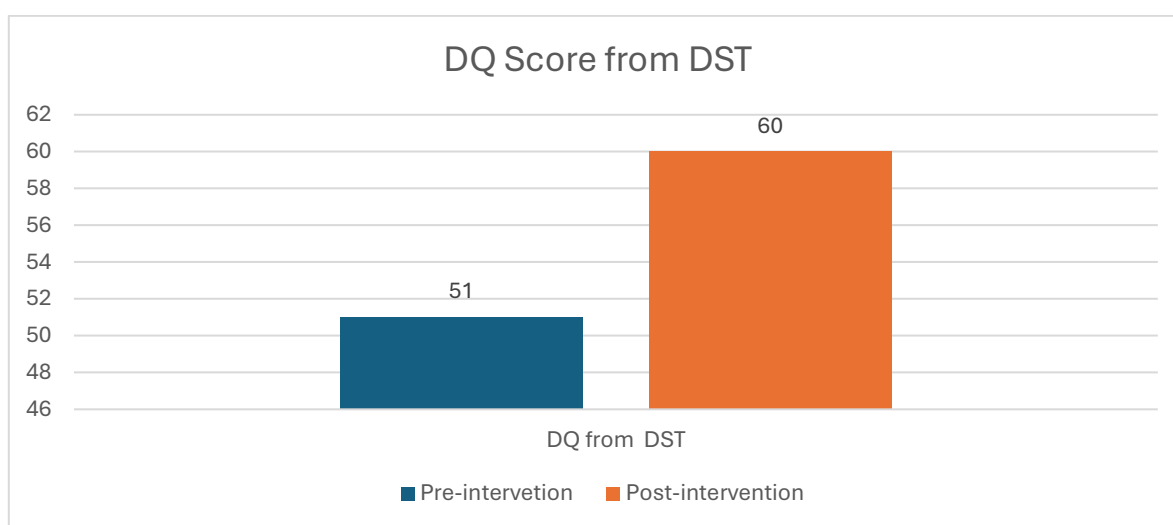
Similarly, successful performance on DST Item 28 provides evidence of improvement in developmental functioning, indicating progress beyond the child's baseline level. Repeated demonstration, restructuring the environment, prompting hierarchy, and immediate reinforcement may have helped the child to understand what is expected from tasks and learn the needed developmental behaviour to execute them more independently. Repeated exposure and retention of the learned skill may have been facilitated by the continuous practice at home, supervised by the mother.

The achievement of DST Item 29 is further evidence of the child's ability to learn age-appropriate skills through structured behavioural learning. The gains seen in attention span, sitting tolerance, imitation skills and responding to simple one-step directions probably provided more of a base for learning this developmental step. CGC was used to ensure that the behavioural techniques were carried out across various contexts, which helped to foster generalisation of the skills beyond the structured parent coaching sessions.

An additional developmental gain was noted for successful attainment of DST Item 32, that is, a higher developmental level than was seen at baseline assessment. This acquisition of this milestone indicates that not only was the developmental task mastered that was delayed, but also the intervention also encouraged the child to move forward in developmental tasks to more complex developmental tasks. This is a positive finding, especially as the child acquired a developmental skill not seen at baseline, suggesting accelerated developmental progress after systematic intervention.

While a few developmental milestones were not achieved at the conclusion of the intervention (Items 22, 26, 30, and 31), the general trend of improvement indicates that developmental gains were made over the 16-week intervention programme. Given the short time period of intervention and the developmental delay at baseline, there is clinically meaningful progress when four additional developmental milestones are met as well as the improvement in the Developmental Quotient. Sustaining parent-mediated interventions for a longer period of time may help the child learn the remaining skills.

In summary, the results of the DST showed that the structured Parent-Mediated Behavioral Intervention delivered via weekly supervision by a clinician and intensive home-based instruction resulted in a significant improvement in the developmental functioning of the child. The developmental gains observed demonstrate the success of the parent/youth service provider model of intervention and early home-based behavioural support for young children with ASD and mild intellectual disability.



2.2 Table 2

Comparison of Vineland Social Maturity Scale (VSMS) Performance Before and After the 16-Week Parent-Mediated Behavioral Intervention

Pre-Intervention (Baseline Assessment)	Post-Intervention (After 16 Weeks of Parent-Mediated Behavioral Intervention)
Unable to copy simple straight lines (Item 27).	Able to copy simple straight lines independently (Item 27).
Unable to give way to another child during play (Item 29).	Able to give way to another child during play with minimal prompting (Item 29).
Unable to discriminate edible and non-edible substances (Item 31).	Able to discriminate edible and non-edible substances correctly (Item 31).
Unable to dress with front opened garments independently (Item 39).	Able to dress with front opened garments with minimal assistance (Item 39).
Unable to put on coat or dress unassisted (Item 41).	Able to put on coat or dress independently (Item 41).
Social Quotient (SQ) = 54 (Social Age: 1 year 10 months)	Social Quotient (SQ) improved to 58 (Social Age: 2 years 2 months)

Table 2 gives the Vineland Social Maturity Scale results showed that, after 16 weeks of the Parent-Mediated Behavioral Intervention Programme, there was an observable improvement in the child's adaptive functioning. There were positive gains in adaptive and social functioning, with an increase in the Social Quotient (SQ) from 54 to 58 and an increase in the Social Age from 1 year 10 months to 2 years 2 months.

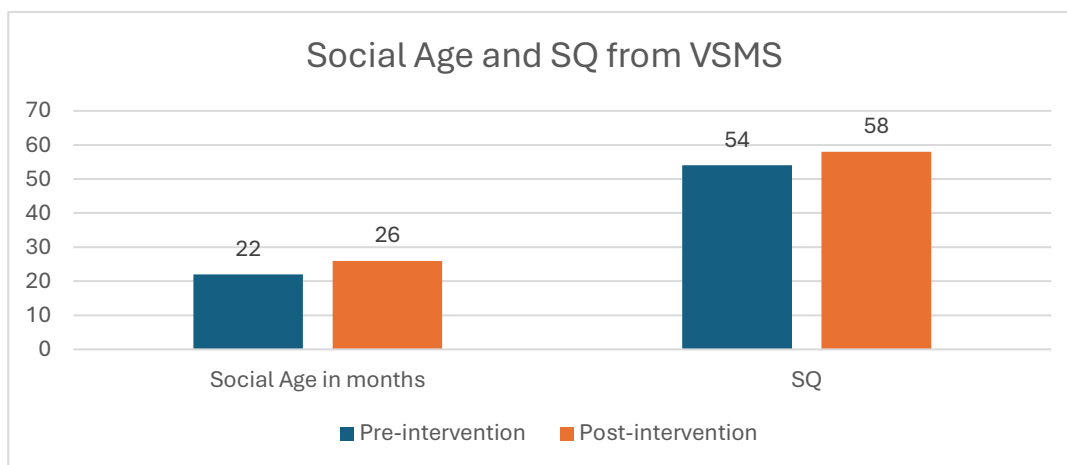
The child achieved the expected early fine motor and pre-academic adaptive skills criterion (Item 27) and made progress. This improvement could be credited to a number of table-top activities, modelling and reinforcement procedures carried out routinely by the mother during the home-based intervention session.

Item 29 was achieved successfully, and this reflected an improvement in social participation and developing cooperative behaviour in structured play activities. The mother was encouraged to provide opportunities for turn-taking in the intervention and to provide opportunities for imitation games and simple interactive play throughout the intervention, which is likely to have supported early social interaction skills.

The progress made towards Item 31 indicated that receptive understanding and practical daily living skills had been improved. Through multiple practice throughout the normal course of household activities, along with visual cues and minimal verbal directions, the child was able to make more accurate discriminations between correct and incorrect objects.

Purchasing Items 39 and 41 was an important step forward in the ability to help oneself and to get dressed. These adaptive behaviours were practiced regularly during everyday dressing tasks, using a method of modelling, verbal prompting, graduated assistance, and positive reinforcement. Gradually, as the prompt was faded, the child was able to be more independent with dressing activities.

A summary of the VSMS findings indicated that a structured parent coaching programme with consistent home-based behaviour practice led to improvements in adaptive behaviour skills, self-help skills and social maturity. Improvements in developmental functioning (DFT) and in autism symptom severity (ISAA) are also achieved, showing that the Parent-Mediated Behavioural Intervention Programme is effective in advancing functional independence in the child.



2.3 Table 3

Comparison of Targeted Goals Performance Before and After the 16-Week Parent-Mediated Behavioural Intervention

Targeted Goals	Baseline recording	Week 4	Week 8	Week 16.
1. Sitting tolerance	10 seconds/count of 10	30 seconds	2 minutes	4 to 5 minutes
2. Imitation skills	Not yet achieved	Only one small gesture	Started imitating simple motor acts with multiple prompts	Simple motor imitation with 1 or 2 prompts
3. Following simple instructions	Not yet achieved	With physical and verbal modelling and multiple attempts	With verbal instructions and partial physical cues	With verbal instruction following single-step simple instructions

The behavioural outcome measures showed clinically significant improvement over 16 weeks across the 3 targeted intervention goals in the Parent-Mediated Behavioral Intervention Programme. Improvements in sitting tolerance, imitation skills, and adherence to simple one-step instructions indicate that systematic parent coaching, ongoing home-based practice, behavioral reinforcement, modelling, and prompt fading facilitated enhanced learning readiness/ adaptive functioning.

2.3.1 *Sitting Tolerance*

The child's starting ability was to sit for about 10 seconds, making it very difficult to participate in structured learning activities. Sitting tolerance is a frequent difficulty for young children diagnosed with Autism Spectrum Disorder (ASD) that may hinder their attention, engagement, and learning. Sit tolerance increased to 30 seconds after four weeks of intervention, meaning that the child was tolerating structured table-top activities for longer periods. Restructuring the environment, positive reinforcement, and the progressive implementation of structured learning tasks may have contributed to this early improvement.

At the end of Week 8, the child could sit for the duration of 2 minutes, indicating that the child has developed self-regulation and attentive behavior. Additional shaping of behavior, reinforcement of successive approximations, and consistent home practice led to further progress. After 16 weeks of intervention, sitting tolerance had improved to 4-5 minutes, and the child was able to engage in more effective therapist-directed and parent-led learning activities. While the length of time was not at the age expected, the significant improvement was a clinically meaningful one and provided a solid base for future developmental learning.

2.3.2 *Imitation Skills*

Imitation skills were not observed during the baseline assessment; the child did not imitate any of the motor actions after repeated modelling. Motor imitation has been viewed as a basic developmental skill which is important to language learning, social interaction and observational learning. After the four-week intervention, the child started to imitate a single simple gesture, showing the emergence of imitation behaviour. This development coincided with the use of modelling, physical prompting, positive reinforcement, and repeated practice in daily routines in a systematic manner.

At the end of Week 8, the child could imitate a few of the simple motor actions but still needed more than a few prompts to be able to successfully perform the motor actions. After additional clinician-guided parent coaching and prompt fading, further progress was made; by Week 16, the child could imitate simple motor actions with only 1 or 2 verbal or gestural prompts. The results indicate that repeated opportunities for observational learning in the natural home environment gradually facilitated the child's emerging ability to imitate and increased his/her agency for more complex social/communication skills.

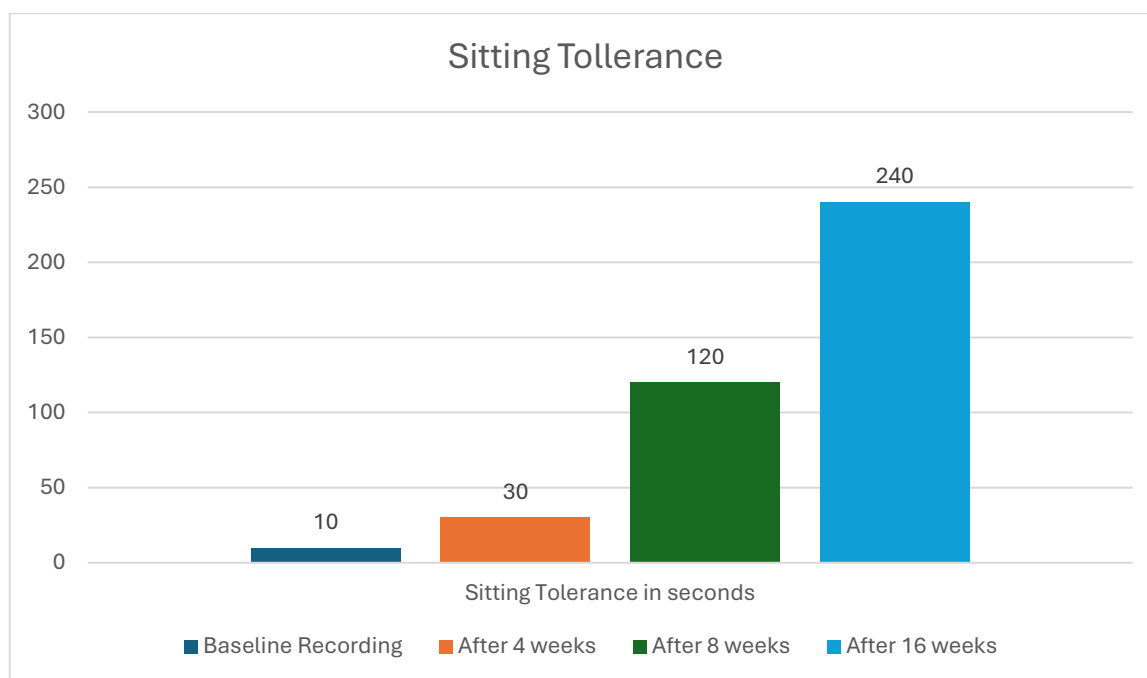
2.3.3 *Following Simple One-Step Instructions*

The ability to follow simple verbal instructions was not evident during the baseline assessment. The child frequently failed to respond to familiar commands and required repeated physical guidance and verbal prompting to complete even simple tasks. During the initial four weeks of intervention, the child began responding to instructions only when physical and verbal modelling were provided repeatedly. This represented an early stage of receptive language development and indicated increasing awareness of task expectations.

By Week 8, the child's responsiveness improved further, with successful completion of simple instructions using verbal cues and partial physical prompts. This progression reflected improvements in attention, comprehension, and learning through repeated behavioural practice. After the intervention, the child was able to follow simple one-step verbal instructions with minimal assistance, demonstrating improved receptive language and reduced dependence on physical prompting. These gains are likely attributable to the combined use of visual supports, modelling, systematic prompting, immediate reinforcement, and repeated practice during everyday home activities.

2.3.4 *Overall Interpretation*

The behavioural outcomes suggest that the Parent-Mediated Behavioural Intervention Programme led to sustained improvement in all areas of focus throughout the 16 weeks of intervention. Progressing gradually at Weeks 4, 8 and 16 indicates that there is potential for meaningful gains in attention, behavioural regulation, imitation and receptive communication skills with consistent behavioural intervention delivered by a trained parent in the natural home environment. Not all age-appropriate functioning was attained in the intervention period; however, the gains observed are clinically significant since these basic skills are the foundation for future language development, adaptive behavior, academic readiness, and social participation. These results hence validate the viability and effectiveness of parent-mediated structured intervention as an early behavioral intervention for young children with mild ASD and Mild Intellectual Disability.



The results of the current study support previous findings that parent-mediated interventions have a positive effect on children's development via improvements in parent-child interaction, child communication, and child behavioral functioning (Oono et al., 2013). Oono et al. concluded that parent-mediated intervention may give rise to improvements in parent-child interaction and may help to reduce autism symptom severity and increase receptive language. In keeping with this, the Preschool Autism Communication Trial (PACT) found that a parent coaching intervention was associated with reductions in the severity of autism symptoms (Green et al., 2015). Similarly, interventions based on Naturalistic Developmental Behavioral Interventions are associated with improved outcomes (Schreibman et al., 2015) if parents deliver interventions that target behaviors in naturalistic environments.

The change in this child replicates the conclusions of Rogers and Dawson (2010) who observed that, when supported by systematic coaching and supervision, parents are able to reliably implement evidence-based developmental practices in everyday routines and naturalistic settings. Findings are also consistent with the studies of Kasari et al. (2010, 2015) where caregiver-mediated interventions targeting imitation, joint attention and play skills improve the social communication and adaptive skills of children. Modeling, positive reinforcement, fading of prompts, and repeated practice of skills at home may also have been responsible for similar improvements in early learning behaviors.

Another important finding of this case is the feasibility of implementing a structured behavioural programme within the home environment. In many low- and middle-income countries, limited availability of trained professionals restricts access to intensive autism intervention services. Divan et al. (2019) and the World Health Organization's Caregiver Skills Training programme have highlighted caregiver-mediated intervention as a practical, scalable, and cost-effective strategy for improving developmental outcomes in resource-limited settings. These approaches empower parents to become active therapeutic partners while increasing intervention intensity within the child's natural environment. The findings of the present case further support these recommendations by demonstrating that a trained mother was able to successfully implement behavioural strategies that resulted in measurable improvements across standardized developmental, adaptive, and behavioural outcomes.

3 CONCLUSION

The present case study provides a clear illustration of how a Parent-Mediated Behavioral Intervention Programme (PMBIP) may support developmental progress in a young child diagnosed with Mild Autism Spectrum Disorder (ASD) and Mild Intellectual Disability (ID). After 16 weeks, with individualized parent coaching and a more or less home-based behavioural intervention, the child seemed to improve in developmental functioning, adaptive behaviour, and also the overall autism

symptom severity. These changes were seen through standardized tools like the Developmental Screening Test (DST), the Vineland Social Maturity Scale (VSMS), and the Indian Scale for Assessment of Autism (ISAA), so yeah, there was evidence not just based on impressions but on measurable outcomes.

Beyond those standardized results, there were gradual behavioural wins too, tied to the specific aims of the intervention. In particular, gains were noted in sitting tolerance, imitation skill development, and the ability to follow simple one step instructions. The child also showed a longer attention span, better involvement in structured learning routines, more readiness to respond to verbal instructions, and an improved capacity to copy basic motor actions. All of that was supported by steady use of behavioural concepts: environmental restructuring, functional behaviour assessment, positive reinforcement, modelling, prompting, then prompt fading, visual supports, and repeated practice at home, which the mother carried out while receiving weekly clinician supervision.

The findings really bring out how parents are essentially the first intervention people, and they also show that caregivers who have been properly trained can put evidence-based behavioural strategies into practice in the child's everyday home setting. Parent-mediated intervention not only ups the overall intervention intensity; it also helps those new skills generalize into common daily moments, and at the same time it reduces how much the family has to rely on clinic-based services. This kind of approach could be especially useful in low-resource settings, where getting access to specialised autism intervention services is kind of restricted.

Also, this investigation has some limits, like its single-case design and the relatively short time period of the intervention. Even with that said, the improvements that were observed still act as preliminary support for the feasibility and clinical usefulness of an individualised parent-mediated behavioural intervention for young children with ASD. For what comes next, future work should use larger samples, more controlled study designs, include longer follow-up checkups, and also examine treatment fidelity so we can be more confident about the long-term effectiveness and how well the results carry over in different contexts.

Still, this case offers early evidence that an individualised parent-mediated behavioural programme, delivered with weekly clinician supervision, plus intensive practice right at home, can lead to clinically meaningful changes in developmental functioning, adaptive behaviour, and autism symptom severity during early childhood. Overall, the results support the expanding literature which backs parent-mediated intervention as an evidence-informed, family centred, and cost-effective model for early autism intervention, particularly in low-resource settings where access to specialised rehabilitation services remains limited.

3.1 Limitations of the Study

1. The present investigation has several limitations that should be taken into account when interpreting the results. First, this study used a single-case design, and this method limits how well the findings can be generalized to the wider population of children with Autism Spectrum Disorder (ASD). Even if the intervention led to clinically meaningful improvements for this child, similar outcomes can't automatically be assumed for all children because ASD is, in a sense, heterogeneous and varies quite a lot from person to person.
2. The intervention ran for a relatively short period of 16 weeks. Even though improvements were noticed in developmental functioning, adaptive behaviour, and autism symptom severity, it's possible that a longer intervention window is needed to see if these gains are retained over time and whether more advanced developmental abilities can actually be acquired later on.
3. The intervention emphasized only three targeted behavioural goals, like sitting tolerance, imitation skills, and following simple one-step instructions. Other key developmental areas, for example expressive language, joint attention, play skills, peer interaction, emotional regulation, adaptive behaviour, and academic readiness, were not evaluated in a systematic way, so we can't really know how the child did in those other domains.

3.2 Clinical Implications

1. The findings from this present case study have important implications for clinical practice, especially in low-resource settings where access to specialized autism intervention services is often quite limited. What the study shows is that parents, when they are given structured training, regular supervision, and evidence-based behavioural strategies, can actually work as primary intervention providers within the child's natural home environment.

2. The intervention protocol developed in this present study blends environmental restructuring, functional behaviour assessment, positive reinforcement, modelling, a prompting hierarchy, visual supports, and systematic home-based practice. Because of that, it ends up being practical, structured, and fairly easy to replicate in everyday clinical settings. The progressive improvements that were observed in developmental functioning, adaptive behaviour, and autism symptom severity indicate that a parent-mediated intervention might raise the intensity of early intervention, without necessarily increasing the financial burden on families in any major way.
3. Moreover, embedding the behavioural intervention into daily home routines gives more repeated learning moments across the day, which then helps with generalization of skills beyond those scheduled therapy sessions. This strategy may be especially useful in India and other low- and middle-income countries where there are shortages of trained rehabilitation professionals, and this shortage often delays access to intensive intervention services. The case presented here therefore supports the addition of structured parent coaching as an integral part of early autism intervention programmes.

3.3 Future Directions

1. Future research should really look at how well the Parent-Mediated Behavioural Intervention Programme works, but with bigger sample sizes and designs that are more strict, for example randomised controlled trials, multiple-baseline frameworks, and longitudinal follow-up studies. I mean these kinds of investigations will give stronger proof about efficacy, dependability, and generalizability of the intervention.
2. Long-term follow-up is also needed to check whether gains in developmental functioning, adaptive behaviour, and autism symptom severity actually stay in place over time, and then whether they spread across home, school, and community settings. In the same line, future work should examine treatment fidelity too, like how consistently parents carry out the behavioural strategies after clinician training, and not just once
3. Also, future studies should broaden the intervention protocol so it covers wider developmental areas, such as joint attention, expressive plus receptive language, play skills, social communication, executive functioning, emotional regulation, adaptive behaviour, and school readiness. Comparative studies would be useful here, especially those that place parent-mediated intervention next to therapist-directed or multidisciplinary programmes, because that would help explain relative effectiveness and also cost-efficiency across different early intervention models.
4. Finally, multicentre studies are recommended, with children coming from varied socioeconomic and cultural groups, to see whether this structured parent-mediated behavioural intervention is feasible and can scale up across different regions of India. If this evidence is gathered, it could help build standardised, culturally fitted, family-oriented early intervention programmes that remain accessible and sustainable within routine clinical practice.

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