

# Enhancing Activities of Daily Living and Social Engagement through Occupational Therapy in a Young Child with Autism Spectrum Disorder: A Case Study

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## Abstract

**Background:** Autism Spectrum Disorder (ASD) during early childhood is often associated with severe impairments in sensory integration, motor and social interaction, which further hinder the acquisition of independence in Activities of Daily Living (ADLs) and interacting with others.

**Methods:** The mixed-methods and single-subject design used in this case study was aimed at assessing the effects of a 6-month, client-centered, occupational therapy (OT) intervention on the outcomes of a 3.5-year-old, nonverbal boy with mild ASD. An integrated evaluation made use of the Short Sensory Profile-2 (SSP-2), WeeFIM, Occupational Therapy Profile, and that of the International Classification of Functioning, Disability and Health (ICF). The intervention included ADL training (inclusion of toileting and dressing), strategies of sensory integration, Picture Exchange Communication System (PECS), and organized social play.

**Results:** The child showed observable improvements in the post-intervention period: parallel play duration went up to 10 or more minutes, the duration of eye contact was up to 4-6 seconds in 8 out of 10 attempts, and he could pull up elastic-waist pants without much assistance. Self-care (WeeFIM Self-Care score) functional independence has increased to the 20 (moderate dependence) level, down to 12 (complete dependence). The sensory processing scores (especially in tactile sensitivity and filtering in auditory) shifted into the typical range of performance.

**Conclusion:** Occupational-based OT holistic intervention was found to be effective in improving the ADL performance, sensory regulation, and the basic social skills of a young child with ASD. The results highlight the importance of regular treatment, goal-setting, and involvement and support of a caregiver in the most effective way to achieve results.

**Keywords:** *Autism Spectrum Disorder, Occupational Therapy, Activities of Daily Living, Social Engagement, Sensory Integration.*

## Introduction

Autism Spectrum Disorder (ASD) is a multifaceted neurodevelopmental disorder, with enduring impairment of social communication and interaction, as well as limited, repetitive behavioral, interest, or activity profiles being the main features of the disorder.<sup>1</sup> The disorder is becoming increasingly common worldwide, and early diagnoses are vital because they can help to initiate timely interventions, which can significantly change developmental trajectories.<sup>2</sup> In addition to the fundamental impairments in social communication and interaction, most children with ASD also have co-occurring difficulties with sensory processing and motor coordination.<sup>3-4</sup>

To young children, these vital occupations revolve around Activities of Daily Living (ADLs) such as feeding, dressing, and toileting abilities and social play which is the primary mediator of learning, communication, and relationship formation.<sup>5-7</sup> Occupational therapy (OT) is in a unique position to deal with these complex challenges by obtaining holistic, client-centered, and occupation-based paradigm, using frameworks such as the International Classification of Functioning, Disability and Health (ICF) to assess the interaction of body functions (e.g., sensory processing), activities (e.g., dressing), and participation (e.g., playing with peers) in a particular environmental context (e.g., home, clinic).<sup>8-9</sup> Strategies based on evidence regarding this population usually involve sensory integration method to enhance modulation, ADL training with backward chaining and visual aids, and augmentative and alternative communication (AAC) systems such as the Picture Exchange Communication System (PECS) to overcome communication barriers.<sup>10-11</sup>

Documentation of the process and results of structured OT interventions can be important in resource-limited environments such as Pakistan, whereby access to specialized multidisciplinary services can be inconsistent,<sup>12</sup> as shown in the case study of the 6-month OT experience of a 3.5-year-old nonverbal boy with mild ASD as a means of establishing a base of meaningful improvements in toileting, dressing, and social play as a foundation of greater independence and participation.

## Methodology

### Participant

"Rohan" (pseudonym) was a 3.5-year-old male with a diagnosis of Autism Spectrum Disorder (Level 1, requiring support). He was referred to outpatient occupational therapy at a government hospital due to significant parental concerns regarding his inability to communicate

toileting needs, complete basic dressing tasks, and engage with peers. He had a history of early intervention, including sporadic speech and occupational therapy for approximately 20 months prior. He was primarily nonverbal, communicating through occasional sounds and gestures. Birth history was unremarkable (full-term, C-section). He enjoyed listening to Islamic hymns (naats) and mobile games, presenting potential motivators for therapy.

### Assessment

A comprehensive baseline evaluation was conducted over two sessions using a mix of standardized and non-standardized tools to create a holistic occupational profile.

#### 1. Standardized Assessments:

- **Short Sensory Profile-2 (SSP-2):**<sup>13</sup> To identify patterns of sensory modulation affecting daily function. Baseline scores indicated "Definite Difference" in Taste/Smell Sensitivity and Underresponsive/Seeks Sensation, and "Typical" performance in Movement Sensitivity.
- **WeeFIM (Functional Independence Measure for Children):**<sup>14</sup> To quantify the level of assistance required for self-care, mobility, and cognitive tasks. Baseline scores were: Self-Care=12 (Complete Dependence), Mobility=23 (Modified Dependence), Cognition=16 (Modified Dependence).
- **Occupational Therapy Profile:** A structured tool to document developmental history, daily routines, interests, values, and family dynamics.

#### 2. Non-Standardized Assessments:

- **Clinical & Naturalistic Observation:** Noted escape behaviors during non-preferred tasks, inability to maintain sitting for structured activities, and solitary play patterns.
- **Semi-Structured Caregiver Interview:** Revealed complete dependence for toileting and dressing, high screen time, and strong bonding with his elder sister and aunt—a potential therapeutic asset.

#### 3. Guiding Framework:

**International Classification of Functioning, Disability and Health (ICF):**<sup>9</sup> Used to structure clinical reasoning:

- **Body Functions:** Impairments in sensory functions (b156), neuromusculoskeletal functions related to hand use (b760), and voice and speech functions (b310).
- **Activities:** Severe limitations in toileting (d530), dressing (d540), and basic interpersonal interactions (d710).
- **Environmental Factors:** Supportive but sometimes overwhelmed primary caregiver (e310); lack of visual supports at home (e1151).

### Intervention Design

A 6-month intervention plan was implemented through weekly 30-minute direct therapy sessions, supplemented by a structured home program. The plan was grounded in multiple frames of reference:

1. **Sensory Integration (SI):** To address underlying modulation challenges impacting attention and tolerance for ADL tasks.<sup>15</sup>
2. **Behavioral & Learning Theories:** To shape new skills through task analysis, chaining, and positive reinforcement.
3. **Developmental Frame:** To sequence skill acquisition appropriately (e.g., parallel play before cooperative play).
4. **ICF Model:**<sup>9</sup> To ensure interventions targeted both child capacities and environmental modifications.

### Intervention Strategies & Goals

#### • Primary Goal 1: Toilet Training

**Strategies:** Use of a visual toileting schedule with PECS cards; systematic desensitization (sitting clothed, then unclothed); reinforcement for attempts; parent training on scheduled sittings.

**Short-Term Goal (STG):** Sit on toilet for 2 minutes without distress in 4/5 trials.

**Long-Term Goal (LTG):** Recognize and express need to toilet via gesture/PECS in 4/5 opportunities.

#### • Primary Goal 2: Dressing Independence

**Strategies:** Backward chaining for pulling up elastic pants; use of dressing dolls; practice with adapted clothing (larger buttons, elastic waistbands); motor activities to strengthen bilateral coordination.

**STG:** Pull up elastic waistbands with minimal physical assistance in 3/4 attempts.

**LTG:** Independently don/doff simple clothing with ≤3 verbal cues.

#### • Primary Goal 3: Social Engagement

**Strategies:** Structured parallel play sessions; use of PECS for "my turn/your turn"; simple group games (musical chairs, ball games) with sibling/aunt present; social stories.

**STG:** Engage in parallel play for 5 minutes in 3/5 sessions.

**LTG:** Participate in simple cooperative play (turn-taking, shared task) for 5 minutes with minimal prompts.

#### • Cross-Cutting Strategies:

**PECS Implementation:** To request items, protest, and communicate during ADLs and play.

**Sensory Diet:** Incorporation of proprioceptive (heavy work) and oral-motor activities before seated tasks to improve regulation.

**Caregiver Coaching:** Weekly briefing and modeling for the mother and involved sister/aunt to ensure consistency.

### Ethical Considerations

Informed written consent was obtained from the parent. All data was anonymized. The parent retained the right to withdraw at any time. The study protocol adhered to standard ethical guidelines for clinical practice.

## Results

The results were compared at the end of 6 months of intervention with the baseline.

#### 1. Functional Performance (WeeFIM):

Rohan was making a significant improvement in each of the areas (Figure 1).

- **Self-Care:** Score changed, 12 (Complete Dependence) to 20 (Modified Dependence: moderate to maximal assistance). He was independent in his pulling up his pants and revealed some interest in toileting.
- **Mobility:** Score was 23 to 25, which indicates that there is more confidence and involvement in transfers and locomotion, but with supervision.
- **Cognition:** The score changed to 16-19. They demonstrated an improvement in understanding of 1-2 step orders and socialization during play, but there was no expressive communication.

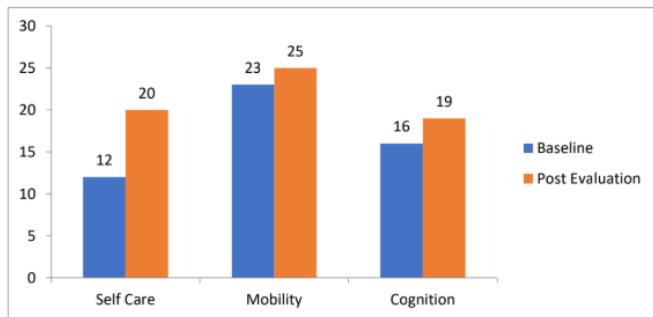


Fig.1 WeeFIM Evaluation

**2. Sensory Processing (SSP-2):** Post intervention scores reported better modulation:

- **Tactile Sensitivity:** 29 to 33 with a probable difference of Probable Difference at 28 and Typical Performance at 33, indicating less defensiveness affecting dressing and grooming.
- **Auditory Filtering:** Has gone up by 22 points (Probable Difference) to 25 (Typical Performance), which means that he/she can better absorb instructions in a noisy environment.
- **Taste/Smell Sensitivity & Sensory Seeking:** Within the same range of definite difference, which underscores the ongoing problem areas in my mealtimes and self-control.

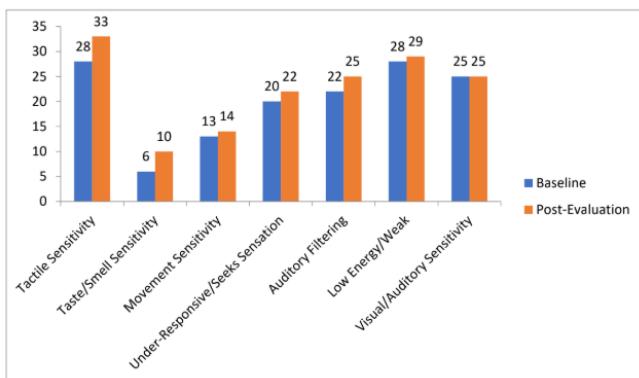


Fig.2 SSP Evaluation

**3. Occupation-Based & Social Outcomes**

- **Toileting:** Developed a lack of awareness to always indicate need through gesture/PECS card in well-known environments. Was able to sit on the toilet for 3 or more minutes with visual timer.
- **Dressing:** Mastered the act of pulling up/down elastic-waist pants and forcing arms into shirt sleeves the first time.

- **Social Play:** The duration of parallel play has increased to 10+ minutes, with a decrease lasting less than 2 minutes. Started to participate in some turn-taking games (e.g., rolling a ball back-and-forth) with a known adult using PECS prompts.

**4. Attention & Compliance:** Sustained attention in structured table-top tasks was developed to 5 minutes. The caregiver reported that escape behaviors during non-preferred tasks had reduced by around 60%.

## Discussion

In this case study, it is shown that an occupation-based OT intervention that is highly comprehensive can bring considerable functional gains to a young, nonverbal ASD child. The improvements in ADL performance, especially in the initial skills of toileting and dressing, are clinically significant since they directly decrease caregiver burden and increase the autonomy of the child with ASD.<sup>17</sup>

The functional gains in certain sensory areas like the tactile sensitivity and auditory filtering, among others, were probably an enabling factor to the manifested functional gains. The decreased tactile defensiveness could have also contributed to the increased tolerance towards the textures of clothes and the physical experiences of toileting, whereas the enhanced auditory filtering could have been helpful in letting the child focus on verbal and social cues during their play.<sup>18</sup> This was critical in the integration of PECS. It helped Rohan have a stable, low-stress approach to expressing the basic needs and trying to take part in social patterns, which helped him cut down on frustration and helped create engagement opportunities. This validates the literature regarding the significance of AAC towards encouraging communication and social engagement in minimally verbal children with ASD.<sup>19-20</sup>

The degree of involvement of the caregivers was a crucial determinant. Although the mother was supportive, the rate and generalization of progress may have been curtailed by challenges in consistency in implementing the home plan, which were reported to occur because of competing household demands and difficulties in managing screen time. This underscores an established challenge in early intervention: the transfer of clinic-based gains into everyday life is largely reliant on daily, coached parent training modules and increased reliance on telehealth as a support and coaching tool.

### Limitations and Future Directions

The single-case design does not allow generalization. Some of the observations have no control condition, and a formal inter-rater reliability, which is a methodological limitation. The 6-month period, although with improvement, is too little to determine long-term maintenance of skills. Future studies need to utilize group designs and extended following up to include standard measures of caregiver stress and self-efficacy in order to know more about the effect of such interventions to the family-system.

### Conclusion

The case offers empirical evidence on the role of occupational therapy in solving the complicated and interrelated problems of ADL performance, sensory response, and social interactions in young children with Autism Spectrum Disorder. Through the use of a client-centered, framework-based approach, which integrates the use of sensory input, skill-based training, augmentative communication, and family collaboration, the occupational therapists will be able to support the meaningful steps towards increased independence and involvement. The results support the importance of early and systematic intervention and the need of healthcare systems, especially in developing nations, to bolster the resources and facilitate access to occupational therapy services through pediatric neurodevelopmental care.

#### Author Contributions

**Romisa Hassan:** Study conception and design, data collection, data analysis, and manuscript preparation.

**Abdul Samad:** Literature review, data interpretation, and critical revision of the manuscript.

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None.

#### Conflict of Interest

The author declare no conflicts of interest in relation to this research study.

#### Funding Disclosure

None.

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