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ORIGINAL ARTICLE

From Bites to Breakthroughs: Occupational Therapy Success in a Neurodivergent World

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Abstract

Background: Autism Spectrum Disorder (ASD) is a complex, co-occurring condition, often marked by multiple sensory processing, feeding, and postural control issues, and school involvement, that is profoundly associated with disability and reduced quality of life. The case study is a description of a 12-week occupational therapy (OT) intervention of a 7-year-old boy diagnosed with ASD and having severe problems in the areas.

Methods: A detailed assessment based on the use of the Short Sensory Profile-2, Pediatric Evaluation of Disability Inventory (PEDI), and clinical observation was used to inform an individualized and family-centered plan. The intervention incorporated Sensory Integration (SI), sequential oral sensory (SOS) approach, developmental strategies, and cognitive-behavioral techniques. They had goals of progressive food texture acceptance, better postural-ocular control in classroom work, and more autonomous involvement in school activities.

Results: The child was significantly improved after the intervention: she was able to eat mixed food textures with minimal support, could perform classroom activities 15-20 minutes independently, and her upright sitting position with a stable head position showed considerable improvement. Changes in behavioral dysregulation in the transition period were reduced significantly. The caregivers also expressed great satisfaction with the effective implementation of home programming.

Conclusion: This case provides support in favor of the effectiveness of a holistic, evidence-based OT intervention incorporating sensory-motor, behavioral, and family-centered interventions as the approach to the solution of complex issues in neurodivergent children. Active collaboration of caregivers and environmental modifications were part of the process of attaining and generalizing functional gains.

Keywords: *Autism Spectrum Disorder, Occupational Therapy, Sensory Integration, Feeding Intervention, Postural Control, Family-Centered Care.*

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Introduction

Autism Spectrum Disorder (ASD) is a common neurodevelopmental disorder, and is marked by enduring differences in social communication, interaction, and sensory-processing behaviors or interests that negatively affect engagement in vital childhood occupations.[1] A major percentage of children with autism spectrum disorders have comorbid difficulties in sensory processing, which may be in the form of hyper- or hypo-reactivity of sensory input.[2-3] Some of the areas of occupation commonly affected by autism spectrum disorders comprise feeding and eating, education, play, and activities of daily living (ADLs).[4]

Problems with feeding, including both severe food selectivity and oral-motor ineptitude, are prevalent, with prevalence up to 80% of children with ASD having these issues.[5] A complex interplay of sensory defensiveness in the form of extreme food selectivity, oral-motor skill deficiency, and psychological inflexibility often underlies these feeding issues.[6] With its primary emphasis on the ability to engage in meaningful activities, occupational therapy is placed in a unique position to address such complex issues holistically, and frameworks such as the International Classification of Functioning, Disability and Health (ICF) can be used to comprehensively assess body functions, activity constraints, and environmental constraints.[7-8], eleven, twelve Interventions are based on known methods, including Ayres Sensory Integration (ASI) to regulate sensory processing, the Sequential Oral Sensory (SOS) approach to systematic feeding intervention, and developmental frames of reference.[10]

In Pakistan, where the resources available to support neurodevelopmental interventions are usually scarce, and awareness on the topic is increasing, the structured case studies illustrating effective culturally responsive OT interventions are essential.[11-12] In this report, the 12-week OT experience of a 7-year-old autistic boy was described, and the importance of an integrative, family-based model to achieve breakthrough improvement in feeding, postural control, and school involvement, and to improve overall functional independence and quality of life was outlined.

Methodology

Participant

The interviewee was a 7-year-old boy known as Zayan (pseudonym) and diagnosed with Autism Spectrum Disorder (Level 2, demanding a high degree of support) at the age of 3. His pediatrician referred him to outpatient OT because of parental complaints of severely limited food intake (only pureed foods and a certain brand of yogurt), inability to engage in classroom activities, and seemingly slumped and having poor sitting balance. He had undergone intermittent early intervention in the past with poor functional improvements. No genetic or neurological comorbidities were reported.

Assessment

A detailed assessment was carried out in three sessions in order to lay a foundation and guide objectives.

1. **Standardized Assessments:**
   - **Short Sensory Profile-2 (SSP-2):**[13] Identified Taste/Smell Sensitivity, Movement Sensitivity, and Underresponsive/Seeks Sensation sections as definite difference, which validated that there are significant sensory modulation challenges.
   - **Pediatric Evaluation of Disability Inventory (PEDI) -Caregiver Report:**[14] In the Self-Care and Social Function domains, especially eating and peer interaction, there were major delays.

2. **ICF Framework:**[10] Utilized to organize clinical reasoning:
   - **Body Functions:** Disturbed sensory functions (b156), neuromusculoskeletal functions connected to the postural control (b760) and emotional regulation (b152).
   - **Activities:** Extreme limitations in eating (d550), attending to community education (d820), and sitting position (d4103).
   - **Environmental Factors:** Supportive nuclear family, but initially a lack of strategies (e310); the physical classroom setting was a barrier because of the absence of adaptive seating (e1151).

3. **Non-Standardize Assessments:**
   - **Clinical Observation:** Instability of the jaw when trying to chew, loss of the midline posture within 2-3 minutes of seated play, avoidance of complex tasks visually, and distress during non-preferred activities.
   - **Structured Parent Interview:** Meal-time more than an hour with high distress, avoidance of all lumpy or mixed textures, teacher reports of turning away during the lesson, and lying down upon the desk in the classroom.

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Intervention Design

An intervention plan based on a 12-week, twice-per-week direct OT intervention was developed, which was based on various frames of reference and incorporated collaboration between the caregivers.

Theoretical Frames of Reference:

- **Sensory Integration (ASI):**[11] To give regulated vestibular, proprioceptive, and tactile feedback to enhance modulation, postural tone, and body awareness.
- **Sequential Oral Sensory (SOS) Approach:**[12] A 32-step, play-based, systematic approach to desensitizing and learning how to eat different textures.
- **Developmental Frame:** To address such skills sequentially as chewing, seated attention, and visual-motor integration.
- **Cognitive-Behavioral Strategies:** To resolve the issue of behavioral rigidity with the help of visual schedules, social stories, and positive reinforcement systems.
- **ICF Model:** [10] To make sure that there were interventions that focused on personal capacities and altered environmental contexts (home and school).

Objective and Strategies:

1. **Feeding & Oral-Motor Skills:**

   - **Short-Term (Weeks 1-4):** Tolerance of oral play on non-food (vibrating toys, chewy tubes). Introduction of messy play using favorite purees. Goal: Accept and swallow soft solids (banana) during 3/5 of the trials.
   - **Mid-Term (Weeks 5-8):** Meltable solids (puffs), practicing the movement of the jaw laterally. Use of graded utensils. Aim: Semi-solids of food (soft chapati) to be chewed and swallowed in 4/5 meals.
   - **Long-Term (Weeks 9-12):** Drill mixed feel (rice with gravy). Pay attention to lip sealing and debriding. Goal: to be able on 5/5 meals to eat a mixed-texture food with minimal spillage.

2. **Postural-Ocular Control and School Participation:**

   - **Short-Term:** Prone positioning on a therapy ball, wall pushes, and Move'n Sit and cushion. Opinion: Sit in an upright position with cues of 5 minutes with a favorite activity.
   - **Mid-Term:** Seated ball catch, suspended swing exercises with visual stimuli, weighted lap pad during table work. Objective: 10 minutes of sitting at the table with minimum prompts.
   - L**ong-Term:** Classroom simulation inclusion: Sitting on a classroom chair with a cushion to fill in a 4-step worksheet. Aim: 15-20 minutes of independent classroom work.

3. **Feeding & Oral-Motor Skills:**
   Weekly caregiver coaching sessions were held. A customized home program included:

   - **Sensory Diet:** Oral motor warming ups and proprioception (deep-pressure activities) 3 times/day, prior to meals.
   - **Environmental Modifications:** Development of a distraction-free meal time station using a visual placemat and regular seating.
   - **School Collaboration:** A short report with strategies (e.g., suggested seating arrangement, using a visual schedule) was distributed to the teacher.
   - **Positive Reinforcement System:** A token economy chart of trying a new food and a seated work.

Results

Measures of quantitative and qualitative outcomes were compared at week 12 and baseline.

Feeding Outcomes: Zayan started by eating only smooth purees and then moved up to a diet including soft solids (banana, mashed potato) and dissolvable solids (puffs) and, most importantly, with mixed texture e.g., rice with small bits of soft chicken and vegetables. Spillage was cut down by about 70. The SOS approach step achievement changed to Step 2 (touches food) to Step 8 (chews and swallows a firm, mechanical solid). At the baseline, parental stress at the mealtime, rated at 9/10, declined to 3/10.

Postural Control: The client can position himself correctly while standing and sitting without issues. The client is able to stand and sit in the right position. Table-top activities with sitting tolerance improved to more than 18-20 minutes reliably, and notwithstanding physical encouragement, which previously was less than 3 minutes. The scores of the SSP-2 post-intervention were better than a Movement Sensitivity section, where the

scores were a Definite Difference from Typical Performance. Within the simulated classroom, he was able to sit on a regular chair with a Move'n Sit 2 cushion, sit upright, and do a 6-part puzzle or a coloring activity when taking 2-step instructions. His teacher states that there was a noticeable change, and now Zayan is sitting with the group during circle time and is trying to complete the given work.

Behavioral Gains: Situations in which the child attempts to limit his behavior can be considered behavioral gains. Those instances where the child tries to restrain his behavior can be referred to as behavioral gains.

The previously experienced difficulty in transitioning between activities with resistance and sometimes meltdowns gave way to easy transition with a visual timer and first-then boards.

Autonomy in ADLs Increased: The feeding did not require much help (previously maximum), and the patient started to show a greater initiation of toileting habits. Confidence of the caregiver, as assessed through a self-efficacy scale, was better by 85%.

The major improvements in feeding tolerance are indicative of the effectiveness of the integration of sensory desensitization (through the SOS approach) and the fundamental oral-motor skill-building. The SOS steps, accomplished in the play setting without pressure, were likely to have minimized anxiety and enabled Zayan to learn about the properties of foods at his own speed, which is a very important component of sensory defensiveness in children.

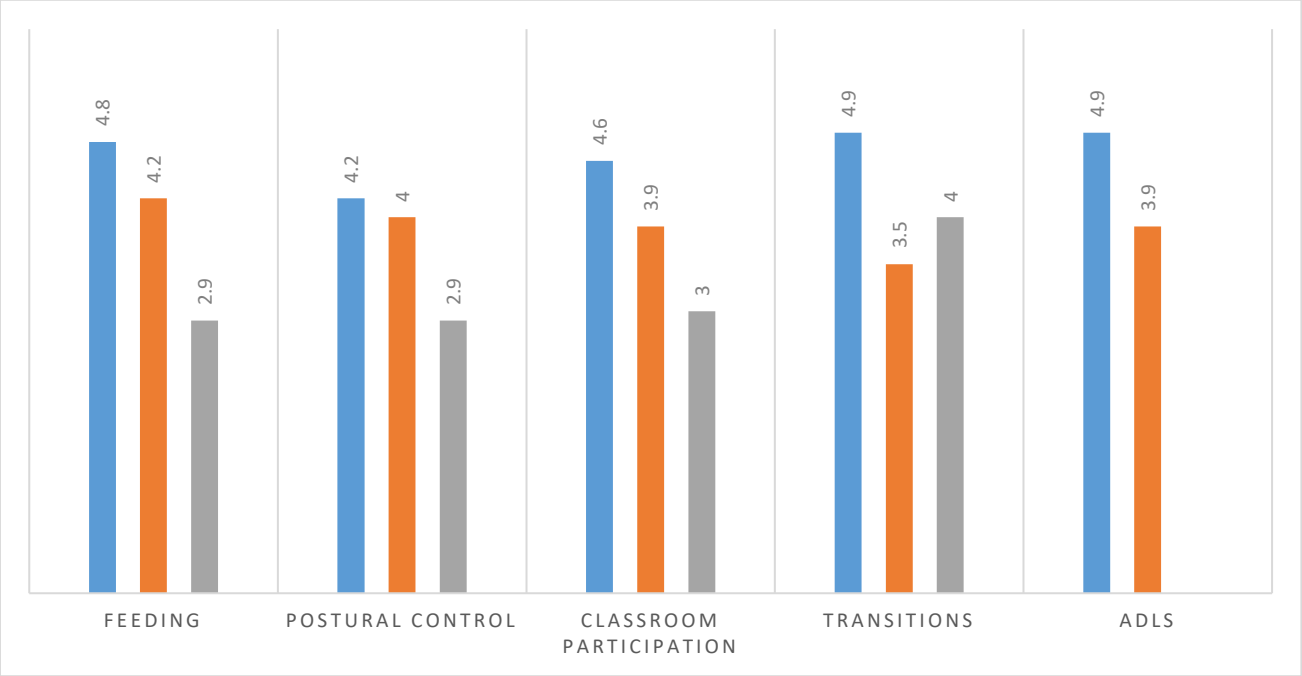

Fig. 1 showing meaningful gains in domains

Table-1 Prognostic Characteristics of a Case

Domain	Pre-intervention	Post-intervention	Prognosis
Feeding/Oral motor	• Restricted to soft foods only • Strong avoidance of texture • Required maximal support	• Chewing & swallowing mixed textures independently • Decreased defensiveness • Minimal amount of cues needed	• Increased expansion of food repertoire • Stable independent chewing

			• Lower risk of nutritional restriction
Postural Control	• Poor pelvic control • Trouble maintaining upright sitting > 3–5 min • Trunk misalignment	• Sustains upright sitting 15+ min • Better trunk alignment • Participates in seated activities	• Increased pelvic stability & core strength • Improved endurance in seated tasks • Reduced compensatory movements
Classroom Participation	• Easily distracted • Engaged < 5 min • Required constant prompting	• Participates 15–20 min in group/table tasks • Responds to instructions with minimal prompts	• Maintained independent classroom participation • Improved attention span • Greater readiness for structured learning
Transition Challenges	• High rigidity • Repetitive meltdowns during meals & transitions	Significant decrease in dysregulation • Smoother transitions with less support	• Increased behavioral flexibility • Stable regulation between home and school settings
ADLs	• Dependent for feeding & toileting • Poor routine compliance	• Increased independence • Developed mealtime and toileting routines	• Continued progress to age-level ADL independence with caregiver support
Caregiver Involvement	• Limited knowledge of strategies • Inconsistent routines	• Actively trained in sensory/oral-motor techniques • Consistent routines developed	• Maintained caregiver compliance with home program • Increased generalization across settings

Discussion

The case study shows how a theoretically-based, occupation-centered OT intervention has positively affected the neurodivergent child who has co-occurring feeding, postural, and participation difficulties. These findings are in line with developing data of multimodal approaches to the complex presentations in pediatrics.[15] The enhancement of the postural stability and seated attention can be related to the aimed proprioceptive and vestibular movement of the ASI. Improved core stability and postural tone were likely to have contributed to a more stable physical foundation in visual tracking and fine motor activities, and increased his ability to engage in classroom activities, which is in line with the ICF model of improving body functions (postural control) to perform activities (sitting to work at school).[16-17]

The importance of environmental modification and caregiver coaching can hardly be overestimated. Due to the extensively applied strategies, the parents were empowered, minimized stress, and formed a unified therapeutic environment, which is particularly crucial in environments with limited access to frequent professional services, and this generalization of skills between the clinic and home and school environments resulted in a sustained therapeutic milieu.[18-20]

Limitations and Future Directions

The current study has limitations in the form of a single-case design and the lack of a control condition that cannot allow a causal generalization. The 12-week period of follow-up is rather short; there is no information on long term results of diet variety and academic involvement.

Future studies need to use bigger samples, randomized controlled designs, and follow-ups in the long term to determine efficacy. More studies on culturally modifying such tools as the SOS approach to Pakistani food staples are also justified.

Conclusion

The multifaceted nature of the issues that neurodivergent children have can be effectively solved using occupational therapy, with a holistic and integrated approach based on Sensory Integration, the SOS feeding approach, developmental strategies, and a robust family-school collaboration. The case of Zayan demonstrates that specific intervention could result in a breakthrough in feeding, postural control, and school involvement, which,

in turn, facilitates improvement in occupational involvement as a whole, and quality of life in the family environment. It supports the urgent necessity of client-based, evidence-oriented OT care in neurodevelopmental support systems in Pakistan and similar situations.

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.

Ethical Approval

It was granted by the Ethical Review Board of Foundation of Medical Research and Laboratory (IRB Protocol Number: FMRL-IRB/2024/027). Informed written consent was obtained from the child's parent/guardian for participation and publication of anonymized data.

Acknowledgments

None.

Conflict of Interest

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

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None.

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