



## EFFICACY OF SENSORY INTEGRATION BASED OCCUPATIONAL THERAPY TREATMENT ON AN AUTISM SPECTRUM DISORDER CHILD: A CASE STUDY

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### ABSTRACT

**Objective:** This study explored the effects of sensory integration based occupational therapy provided in an outpatient clinic on the functional behaviors of a 4 years young child with autism spectrum disorder.

**Method:** The participant is a 4 years old boy with ASD. Before the study, the participant had not received a consistent program of sensory integration based occupational therapy. The child is assessed using Indian Scale for assessment of Autism (ISAA) and Sensory profile (Dunn1999). The child received one hour of sensory integration-based treatment four times a week for six consecutive months. **Results:** The child displayed significant improvement in social relationship and reciprocity, behavioural patterns and cognitive aspects. Decreases were noted in the frequency of aggressivity, inattentive behaviours. The child engages in group plays, shares objects to others. **Conclusion:** The finding suggests that application of sensory integration based occupational therapy is effective for the child with ASD. Further research is needed in larger sample.

**KEYWORDS :** child ,Autism spectrum disorder, sensory integration, occupational therapy

### INTRODUCTION

Autism spectrum disorder (ASD) is a complex developmental condition involving persistent challenges with social communication, restricted interests and repetitive behavior. Although autism is considered a lifelong disorder, the degree of impairment in functioning because of these challenges varies between individuals with autism. (American Psychiatric Association2023). Generally, autism is diagnosed around 2 years of age, which is based upon parental observation of children and retrospective reviews of videotapes and home movies. Autism varies in severity manner which can be modified by different factors, like; education, ability and temperament. Autism is frequently associated with other disorder, such as attention deficit disorder, motor incoordination, sensory dysfunction and psychiatric symptoms such as anxiety and depression. Current research shows that environmental factors along with genetic susceptibility are the probable cause of autism.

### Sensory Dysfunction and Self-Regulation Difficulties in ASD

One of the central characteristics of ASD is dysfunction in the sensory processing system of the autistic child. The sensory system or sensory organs and the autistic individual's senses of sight, hearing, smell, touch and proprioception process diverse input from the environment in an atypical way.

#### Sensory dysfunction:

Auditory - sensitive to certain sound like crackers, balloons, pressure cooker, dog barking, loud noises, fan sound

Tactile - sensitive to touch

Avoiding messy play

Irritation to certain cloth/food

Difficulty in hair/nail cutting

Visual – uncomfortable to sunlight

Seeking of colored light

Difficulty in eye contact

Olfactory- crave strong smell

Smear his /her shoes

Vestibular- Seeks fast moving activities Engages in spinning, jumping, bouncing, running

Proprioceptive– Exert too much pressure while handling object

Difficulty in maintaining one body position

Gustatory- Continuously mouthing finger/objects

Craving for certain food

### Self-Regulation Dysfunction

Self -regulation is the nervous system's ability to attain, maintain, and change levels of arousal or alertness (Williams andShellenberger,1994). Dysfunction in self-regulation leads

to inattention, easy frustration, poor impulse control, imbalance in emotional reaction.

### METHODS

A descriptive case study design was used to evaluate the effectiveness of sensory integration approach in occupational therapy. For assessing the child Indian scale for assessment of autism (ISAA), the sensory profile (Dunn,1999), parental interview and systematic observation of the child's behavior were used. Based on assessment data, Client-specific goals were developed and reviewed with the parents. Progress related documentation was collected in every two month for a consecutive six months. After six month the patient is reassessed using the ISAA scale and sensory profile to measure the success of sensory integration based occupational therapy program.

### Participant

V was a 4-year-old male child who lived with his parents and an younger sister in a smart city. He was born after a full-term pregnancy with birth related complications. At about 2 years of age when V's language lagged, his parents contacted the local early intervention agency and were provided with speech& language therapy, physiotherapy and educational support services for 1 year. After 1 year of early intervention, a comprehensive reevaluation was done, although some improvements were noted, V still have had substantial needs in his expressive language skills and his overall social, emotional, behavioral, motor coordination and sensory development. V was still hesitant to participate in new activities and avoided sensory activities, which was affecting his Ability to participate in social contexts or to play independently. In addition, V's mother oral sensory sensitivities as well as movement and auditory seeking. V's parent decided to seek additional occupational therapy services, specially Occupational Therapy-Sensory Integration interventions.

### Measures

Indian scale for assessment of autism (ISAA) and Sensory profile (Dunn1999) was used to assess V's behaviors and their potential sensory basis and severity of Autism.

### Indian Scale For Autism Assessment

ISAA is an objective assessment tool for person with autism. ISAA consists of 40 items rated on a 5-point scale ranging from1 (never) to 5(always). The 40 items of ISAA are divided under six domains i.e.

Domain-I Social Relationship and Reciprocity

Domain-II Emotional Responsiveness

Domain -III Speech -Language and Communication

Domain IV Behavior Pattern  
 Domain V Sensory Aspects  
 Domain VI Cognitive Component

ISAA is reported to be an accurate, valid and reliable Indian tool for diagnosing ASD and grading severity among 2-20 years age persons.

ISAA can identify autism at a cut-off score of 70 .  
 Scoring level:  
 No autism - <70  
 Mild autism – 70-106  
 Moderate autism – 107-153  
 Severe autism- > 153

The Sensory profile measures the developmental barrier that create difficulties in performing daily activities. The content validity of sensory profile is 63% and the construct validity is rated as moderate.

Goals for therapy were developed in collaboration with V's parent and focused on improving sensory processing as well as reducing the level of severity of autistic features for enhancing his ability to participate in ADLs. On the basis of Sensory integration and the practice guidelines for occupational therapy, goals were focused on Occupation-based outcomes and the underlying sensory components that had an impact on child.

**Table 1. Indian Scale For Assessment Of Autism Domains Scores For V**

Domains	Pre scoring	Post Scoring
Social Relationship and Reciprocity	29	20
Emotional Responsiveness	14	8
Speech-language and Communication	28	19
Behavior Patterns	20	11
Sensory Aspects	17	9
Cognitive Component	12	7

Total pre scoring is 120(moderate autism),total post scoring is 74 (mild autism)

**Assessment Findings**

The occupational therapy assessment of V indicated that V demonstrated notable deficits in sensory processing that were affecting his ability to participate optimally in social relationships and reciprocity emotional responsiveness, speech-language and communication, Behavioral patterns, sensory aspects and cognitive component. Specially, he demonstrated hypersensitivity to tactile, oral sensation, auditory and vestibular seeking, limited food repertoires; exaggerated emotional, behavioral responses and expressive language delays. The total score of six domains before the test is 120 which demonstrate child had moderate autistic features.

Based on the assessment results, direct O.T-S. I was recommended four times per week with frequent consultation and collaboration with V's mother and aunty on every 2-month intervals. Direct individual therapy was aimed at remediation of the underlying sensory hypersensitivity. Therapy was provided in the OPD of Occupational therapy department KLE Dr.PK. KORE HOSPITAL & MRC center, Belagavi, Karnataka.

V's Treatment plan:  
 Short term goal:  
 1<sup>st</sup> and 2<sup>nd</sup> month:  
 V demonstrated awareness of different texture within first 2 months of intervention.

Liked to play gross motor activities like crossing obstacles and

picking objects that demonstrate he is developing eye hand co-ordination .

3<sup>rd</sup> and 4<sup>th</sup> month:  
 V was engaged with fine motor activities like putting pins , picking small items , playing beads and thread games, Oromotor therapy

5<sup>th</sup> and 6<sup>th</sup> month:  
 Sharing objects with peer groups, group play, and ADL training.

Long term Goal:  
 Accommodation in different environment.

Participation in family related and peer group elated activities.

Independent in age appropriate ADL task

**RESULTS**

Six months after reassessment was done using ISAA scale and parent interview.

The post intervention ISAA scoring of child was 74 (mild autism) V demonstrated improvements in

- 1) motor planning and participation in age-appropriate activities.
- 2) Decreased oral-sensory sensitivity and expanded his repertoire of food and participation with family and peers at mealtime.
- 3) Improved social development and began to initiate social play with peers
- 4) Improved fine motor and bilateral co-ordination activities.

V's improvement in his ability to tolerate and process sensory input were apparent in home, community and hospital. During his occupational therapy sessions, he progressed from unwillingness to participate in sensory mat and movement activities to playfully enjoying those activities. His hand flapping and head banging reduces. He tolerated oral-sensory stimuli and ate a variety of foods that enabling him to participate more successfully in mealtime activities.

**Parent Interview**

The parent interview conducted during the final month of occupational therapy services revealed substantial improvements in V's occupational performance and participation. V's described how his improvement in sensory processing allowed him to participate in age-appropriate activities more successfully, complete self-care activities independently, socially interacting with his family members and peers more effectively and perform more successfully in kindergarten school. she also noted the positive impacts of these improvements on their family routines:

He is able to withstand different textures, tactile related items that he was not able to do before. We are able to go to festivals, temple and V is staying quietly at one place , expressing his demands to others. He is (now) liking to walk on bare foot , knows to keeps the shoe correctly , trying to saying appa, Amma , blue like words , indicates for toileting, liking to play with peers and sharing toes to others. He is totally changed now. We are very happy for his progression.

**DISCUSSION**

This article presents a case study report of a child with poor sensory modulation and occupational performance deficits and details improvement in occupational performance during 6 months of O.T-S.I intervention. This case provides a model of occupational therapy intervention rooted in the theory based clinical reasoning, exemplify the use of sensory integration

theory to address the underlying issues affecting occupational performance.

This case contributes to the evidence for using a sensory integrative approach within occupational therapy, demonstrating the interrelationships among sensory processing, behavior and occupational performance

V's behavior, development and participation were adversely affected by poor sensory processing and thus the theory of sensory integration provides the basis for an intervention program.

This case exemplifies a systematic method of data collection and analysis that that may be useful in the clinical setting for evaluating outcomes of occupational therapy. Occupational therapists have a professional responsibility to monitor and evaluate our effectiveness.

### Limitations

Although this case provides information which can be useful for clinicians working with children who have sensory related issues in autistic children, because it is a case report the results can not be generalized to the population of children with poor sensory processing. Additional studies are needed to validate the findings. The second limitation is the assessment data relied mainly on parent report, interview so there is limited objective assessment.

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