



IMPACT OF SENSORY DIET THROUGH OUT DOOR PLAY ON LEARNING DISABLED CHILDREN'S FUNCTIONAL BEHAVIOR

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ABSTRACT

Aim

This study aimed to evaluate the effect of a sensory diet implemented through outdoor play on the functional behavior of children with learning disabilities.

Objectives:

- To screen children with learning disabilities using the Teachers' Questionnaire for Children with Learning Problems.
- To assess the level of functional behavior in children with learning disabilities.
- To evaluate the impact of a sensory diet through outdoor play on functional behavior in children with learning disabilities.

Methods:

A total of 30 children aged 7 to 12 years were included in the study, with 15 participants in the experimental group and 15 in the control group. The experimental group underwent an intervention involving a sensory diet through outdoor play, while the control group did not receive the intervention. Statistical analysis using the "t" test was conducted to process the results.

Results:

The statistical analysis revealed a significant improvement (t-value was 3.146, and the p-value was 0.0072) in functional behavior among children with learning disabilities who participated in the sensory diet through outdoor play intervention.

Conclusion:

The findings indicate that implementing a sensory diet through outdoor play significantly enhances functional behavior in children with learning disabilities.

Keywords: Sensory diet, outdoor play, functional behavior, learning disability

INTRODUCTION

Learning disabilities (LD) are neurological disorders that affect the brain's ability to receive, process, and respond to information. According to the National Center for Learning Disabilities (NCLD), these conditions can impair a person's capabilities in listening, speaking, reading, writing, and mathematics [1]. In addition to academic challenges, individuals with learning disabilities often experience difficulties in social and emotional domains, such as peer relationships and social interactions, further complicating their overall development [2].

In India, approximately 13–14% of school-aged children are affected by learning disorders, making this an urgent concern for educators and healthcare professionals [3]. Children with learning disabilities often encounter daily negative experiences and frequent failures, which can lead to low self-esteem and hinder their emotional growth [4]. Many of these children face difficulties understanding spoken language, interpreting others' intentions, or expressing their thoughts effectively, resulting in barriers to interpersonal communication [5]. Addressing these challenges is crucial to

helping children achieve social competence and overall well-being.

Sensory diets, a widely recognized intervention in occupational therapy, were first introduced by Patricia Wilbarger. A sensory diet involves personalized, sensory-based strategies tailored to an individual's needs to promote optimal arousal levels, typical development, and improved occupational performance [6]. Unlike standardized interventions, sensory diets are customized, client-centered routines that integrate therapeutic activities into daily life. While they are frequently used in pediatric practice, sensory diets have also shown benefits for other populations, including older adults and individuals with psychosocial challenges [7].

In school-based occupational therapy, the role of sensory diets is gaining recognition for their ability to support children with learning disabilities. Integrating sensory diets into outdoor play activities presents an innovative opportunity to enhance services provided in schools. Outdoor play can serve as a platform to implement sensory-based strategies, fostering not only functional behavior but also social and emotional development. By exploring the impact of sensory diets

through outdoor play, this study aims to contribute to the growing field of school-based occupational therapy interventions.

AIM:

The aim of the study is to find out the effect of sensory diet through outdoor play on functional behavior in children with learning disability

OBJECTIVES:

- To screen learning disability

METHODOLOGY

This study initiated with proposal in front of IEC of JKK Munirajah Medical Research Foundation with ethical committee reference number IEC/OT/ 46-2024. The study adopted a two-group, pre- and post-test quasi-experimental design to evaluate the effectiveness of a structured intervention program. A convenient sampling technique was employed, and the sample consisted of 30 participants divided equally between the experimental and control groups. The study was conducted at Munirajah Matriculation Higher Secondary School, Tamil Nadu, India, over six months. The intervention period spanned 13 structured sessions, focusing on improving the functional behavior of children with learning disabilities through sensory diet-based outdoor activities.

Participants aged 7–12 years, diagnosed with learning disabilities by a pediatrician, were included, while those

children using Teachers questionnaire for children with learning disability.

- To assess the level of functional behavior in children with learning disability.
- To evaluate the effect of sensory diet through outdoor play on functional behavior in children with learning disability.

with physical impairments or associated conditions such as Autism Spectrum Disorders (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) were excluded. Screening was conducted using the Teachers Questionnaire for Children with Learning Disability [8], and functional behavior was assessed using the Weiss Functional Impairment Rating Scale (WFIRS) [9], which demonstrated strong psychometric properties.

The intervention included a variety of outdoor sensory activities targeting motor, cognitive, and social skills. Each session lasted 45 minutes and was conducted thrice weekly. Activities, such as tactile stimulation including Paw prints, tactile roads, and peanut hunting [10], Motor coordination activities like hopscotch, tug-of-war, and kneel-walking on tactile paths can enhance both gross motor coordination [11] and proprioception [12]. balance exercises with Tandem walking, sac races,

and jumping over obstacles [13], and interactive games such as Musical chairs, land-sea-air, and clay activities [14], were progressively challenging, engaging, and monitored for safety. The control group did not receive any intervention, allowing for a comparative analysis of the program's impact.

DATA ANALYSIS AND RESULTS

Table 1 compares the pre-test values of the control and experimental groups. The mean values for the control and experimental groups were 39.86 and 39.6, respectively. The calculated t-value was 0.06904, and the p-value was 0.9455, indicating no significant difference between the groups in the pre-test phase (**Graph 1**).

Table 2 compares the pre-test and post-test mean values of the control group. The mean values for the pre-test and post-test were 39.86 and 39.93, respectively. The calculated t-value was 1.000, and the p-

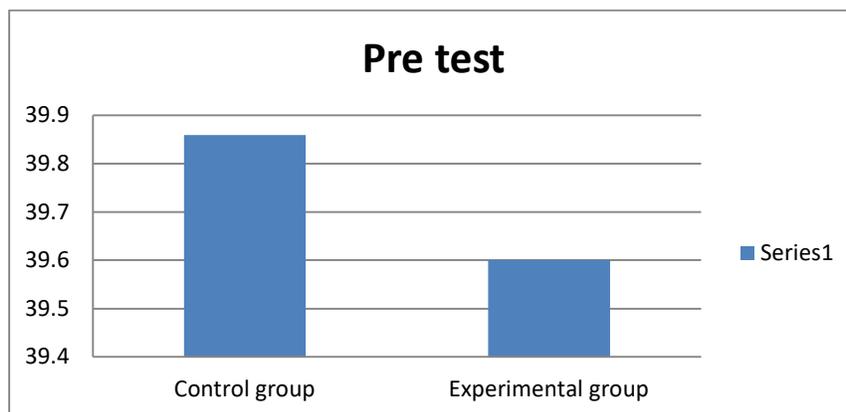
value was 0.3343, showing no significant difference between the pre-test and post-test scores within the control group (**Graph 2**).

Table 3 compares the pre-test and post-test mean values of the experimental group. The mean values for the pre-test and post-test were 39.6 and 38.2, respectively. The calculated t-value was 3.146, and the p-value was 0.0072, indicating a statistically significant difference between the pre-test and post-test scores within the experimental group (**Graph 3**).

Table 4 compares the post-test mean values of the control and experimental groups. The mean values for the control and experimental groups were 36.53 and 26.6, respectively. The calculated t-value was 3.913, and the p-value was 0.0005, indicating a highly significant difference between the post-test scores of the two groups (**Graph 4**).

Table 1: Comparison of Pre-Test Values Between Control Group and Experimental Group

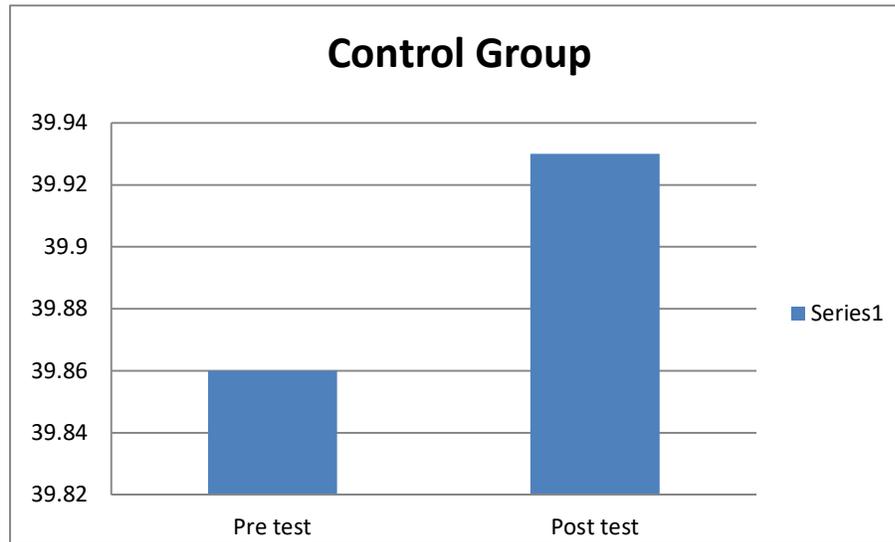
Group	Test	Mean	S.D value	t- value	p- value
Control group	Pre test	39.86	11.199	0.06904	0.9455
Experimental group	Pre test	39.6	9.920		



Graph 1: Pre Test

Table 2: Comparison of Pre-Test and Post-Test Values of the Control Group

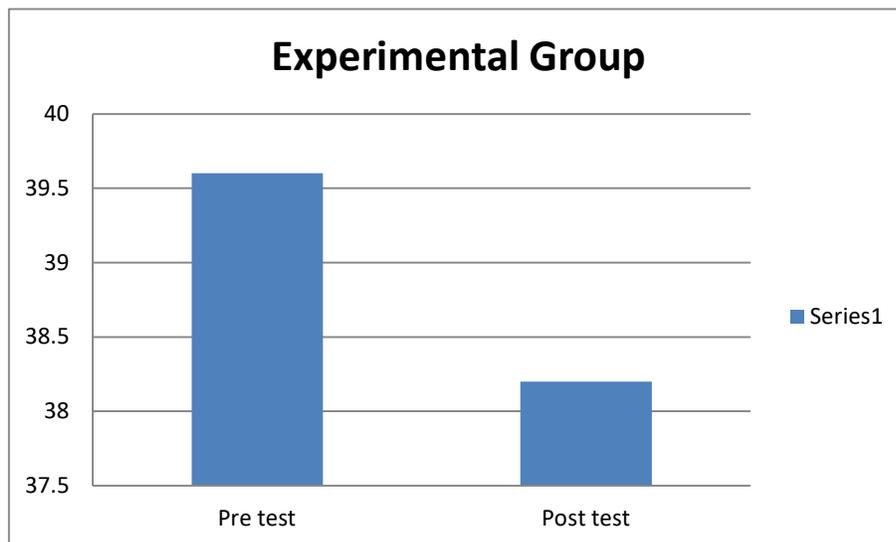
Group	Test	Mean	S.D value	't' value	'p' value
Control group	Pre test	39.86	11.199	1.000	0.3343
	Post test	39.93	11.126		



Graph 2: Control Group

Table 3: Comparison of Pre-Test and Post-Test Values of the Experimental Group

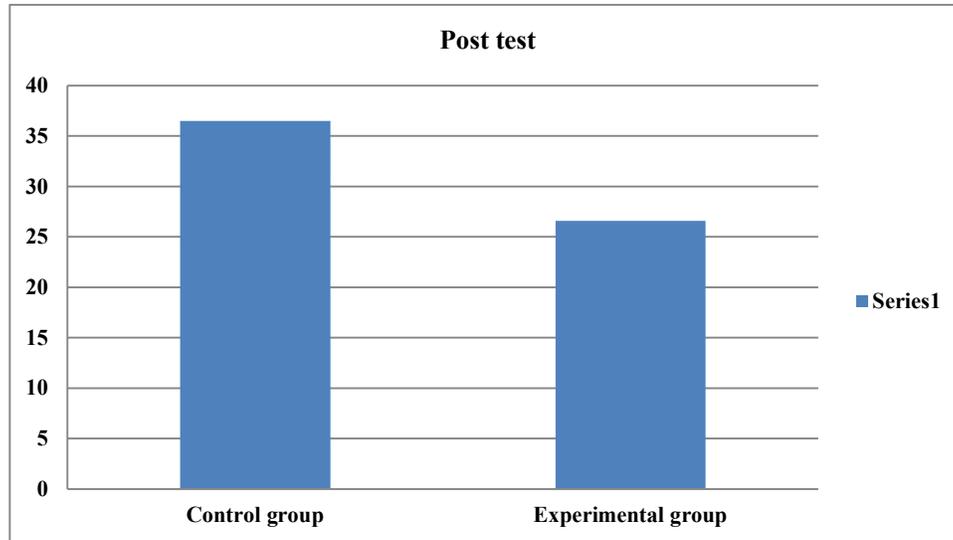
Group	Test	Mean	S D value	't' value	'p' value
Experimental group	Pre test	39.6	9.920	3.146	0.0072
	Post test	38.2	9.198		



Graph 3: Experimental Group

Table 4: Comparison of Post-Test Values Between Control Group and Experimental Group

Group	Test	Mean	SD value	't' value	'p' value
Control group	Post test	36.53	7.279	3.913	0.0005
Experimental group	Post test	26.6	6.510		



Graph 4: Post Test

DISCUSSION

The study aimed to evaluate the effect of sensory diet-based outdoor play on functional behavior in children with learning disabilities. Participants were selected based on inclusion criteria and assessed using the Teacher's Questionnaire for Children with Learning Disability and the Weiss Functional Impairment Rating Scale. The pre-test data were collected, followed by a structured outdoor play intervention for six months, comprising six sessions per week, one hour per session. Post-test data were collected after the intervention, and the scores were statistically analyzed using the paired and unpaired t-tests.

Table 1 and Graph 1 illustrate

the pre-test mean values of the control group (39.86) and the experimental group (39.6). The t-value was 0.06904, and the p-value was 0.945, indicating no significant difference between the two groups at baseline. This demonstrates that both groups were comparable before the intervention.

Table 2 and Graph 2 present the pre- and post-test mean scores of the control group, which were 39.86 and 39.93, respectively. The calculated t-value was 1.000, and the p-value was 0.3343. Since the table value was greater than the calculated value, no significant improvement was observed in the control group over time.

Table 3 and Graph 3 show the pre- and post-test mean scores of the experimental group, which were 39.6 and

38.2, respectively. The calculated t-value was 3.146, with a p-value of <0.0072. Since the table value was less than the calculated value, there was a statistically significant improvement in functional behavior in the experimental group after the intervention.

Table 4 and Graph 4 highlight the post-test mean values of the control group (39.93) and the experimental group (38.2). The calculated t-value was 3.913, with a p-value of <0.0005, indicating a significant difference between the two groups. This suggests that the intervention effectively improved functional behavior in the experimental group.

The findings of this study highlight the significant positive effect of sensory diet-based outdoor play on the functional behavior of children with learning disabilities. Notable improvements in the experimental group's functional behavior were observed, as reflected in the significant difference between pre- and post-test scores. In contrast, the control group did not exhibit any significant changes, reinforcing the effectiveness of the sensory diet-based intervention.

These findings are in line with the work of Due *et al.* [11], who explored the impact of outdoor play activities on motor fitness in children. Their study indicated a relationship between versatile play in natural environments and enhanced motor skills such as balance and coordination,

which parallels the improvements observed in the current study's experimental group. The sensory integration techniques used in this study, designed to enhance motor coordination and sensory processing, likely contributed to the observed behavioral improvements.

Further supporting the results, Smith *et al* [10] found that sensory integration therapy improved vocalization and verbal behavior in children with autism. The therapeutic effects of sensory diets in the present study are similar in that they enhanced the functional behavior of children with learning disabilities by providing a structured outdoor play environment that stimulated sensory processing. The sensory diet utilized in this study appears to have had a similar positive impact on the children's engagement and behavior.

Additionally, Benson and Kumar [13] emphasized the positive outcomes of sensory integration interventions on sensory motor skills and praxis. This study supports their conclusion, as the sensory diet-based intervention resulted in improvements in sensory motor coordination and functional behavior. The use of sensory integration techniques to facilitate better engagement in desired occupations is corroborated by these results, further affirming the therapeutic value of the intervention.

Carissa J. Cascio [15] explored the significance of somatosensory processing in typical development and neurodevelopmental disorders. This aligns with the current study's premise, where sensory integration techniques targeted specific sensory processing pathways to enhance the children's ability to engage in functional activities. The sensory diet-based intervention utilized in the current study seems to have helped address sensory processing challenges, leading to improvements in behavior and engagement in functional tasks. Gabriels and Agnew [16] also provided evidence for the effectiveness of sensory integration-based therapies, as shown in their study of therapeutic horseback riding for children with autism. Their research focused on self-regulation and praxis skills, which are similar to the functional behaviors targeted in this study. Although the intervention modality was different, the therapeutic outcomes of enhancing self-regulation and functional skills align closely with the outcomes observed in this study.

The findings from Jorge *et al* [17] further resonate with the results of the current study. Their work demonstrated the efficacy of a sensory diet program in reducing signs of fussiness in infants with sensory processing disorder. The current study's findings also highlight the role of sensory diets in promoting positive

behavioral changes, underscoring the importance of tailored sensory interventions for children with learning disabilities.

Finally, Sahoo *et al* [18] found that sensory diets through outdoor play significantly impacted functional behavior in children with ADHD. The results of the present study corroborate their findings, with the sensory diet intervention yielding significant improvements in children's behavior. The 13-session program used in this study, focusing on sensory integration and motor coordination, aligns well with the interventions reported by Sahoo *et al.*, [18] demonstrating the broader applicability of sensory diet-based outdoor play as an effective therapeutic tool.

In conclusion, this study's findings are consistent with a growing body of evidence supporting the positive effects of sensory diet-based outdoor play on the functional behavior of children with learning disabilities. The significant improvements observed in the experimental group, along with the comparison to the control group, underscore the potential of this intervention to facilitate positive developmental outcomes in children with learning disabilities. Further research is needed to explore long-term effects and refine the intervention's components for even greater efficacy.

CONCLUSION

The research confirms the positive impact of sensory diet-based outdoor play on improving functional behavior in children with learning disabilities. The findings underscore the importance of incorporating structured outdoor play into therapeutic programs for this population to enhance their functional abilities and overall quality of life. Future research could explore the long-term effects of such interventions and their applicability to other developmental disorders.

Limitations And Recommendations

This study had several limitations that should be considered. Firstly, the sample size was limited, which may affect the generalizability of the findings. The study focused on a confined age group, thereby excluding the potential influence of broader age ranges. Additionally, gender-based comparisons were not included, which could provide insights into gender-specific outcomes. The study also did not compare the intervention with other treatment methods, limiting the scope of its comparative effectiveness. Lastly, the study was conducted over a short duration, which may not fully capture the long-term effects of the intervention.

Based on these limitations, several recommendations can be proposed for future research. Expanding the study to include a larger sample size would enhance the reliability and applicability of the

findings. Incorporating follow-up assessments could provide a deeper understanding of the long-term impact of the intervention. Future studies should also explore gender-based comparisons to identify any gender-specific variations in outcomes. Additionally, comparing the effectiveness of the intervention with other treatment techniques could offer valuable insights into its relative benefits. These recommendations would help address the limitations and contribute to more comprehensive research in this area.

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