



## Effect of Multi-Sensory Approach to Improve ADL Performance in Children with Autism Spectrum Disorder: A Quasi-Experimental Study

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### Abstract

The study entitled effect of multi-sensory approach to improve ADL performance in children with autism spectrum disorder.

**Study Design:** Quasi-Experimental

**Participants:** 40 children with ASD of age 12-16 years meeting inclusion criteria were randomly allocated for intervention program. The 12-week structured multi-sensory and ADL activity program will be implemented with 40 minutes per session.

**Methods:** The participants were assessed one week prior to the interventions and one week after the intervention by the Waismann ADL Scale.

**Result:** The statistical analysis was done to determine whether the null hypothesis would be accepted or rejected. In the post-test, the calculated p-value was less than 0.05, exceeding the significance threshold of 0.05. Therefore, the statistical findings are considered significant ( $p < 0.05$ ), leading to the acceptance of the alternate hypothesis ( $H_0$ ). This acceptance suggests that the multi-sensory approach has a significant effect on enhancing ADL performance in children with autism spectrum disorder. **Conclusion:** The comprehensive analysis of multi-sensory approach outcomes collectively supports the positive impact of a multi-sensory approach in promoting skill development and enhancing the daily lives of children with autism spectrum disorder.

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**Key words:** Autism Spectrum Disorder, Activity of daily living, multi-sensory approach

### Introduction

Autism spectrum disorder refers to the neurological developmental disorder having characteristic features such as impairment in social interaction and communication<sup>1</sup>. Autism spectrum disorder (ASD) is a neurodevelopmental condition marked by repetitive behaviours, limited interests, and difficulties with social interactions. The diagnostic criteria for ASD were updated from the previous 4th edition (DSM-IV) in 2013 with the release of the Diagnostic and Statistical Manual of Mental Disorders—5th edition (DSM-5)<sup>2</sup>. The DSM-IV classified pervasive developmental disorders (PDDs) as autism disorder, Asperger's disorder,

childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified (PDD-NOS). In DSM-5, these diagnoses were combined into a single concept known as a "spectrum" ASD diagnosis<sup>3</sup>. Rett syndrome is now classified as a distinct neurological condition and is no longer listed under ASD in the DSM-5<sup>4</sup>. For people with impairments in social communication, a distinct social (pragmatic) communication disorder (SPCD) was created.

Recreational and leisure activities are mostly affected children having autistic features. Incorporate sensory motor difficulties, repetitive motor movements and atypical reactivity to sensory input are other associated problems found in children having autism. Activities of daily living are affected adversely in clients having some sensory issues<sup>5</sup>. Difficulties in interpreting and processing of given commands to get appropriate results. According to diagnostic and statistical manual of mental disorders of the American psychiatric association DSM5 group presenting sensory motor difficulties usually affect more than one sensory modalities<sup>6</sup>. Response can be either hyper or hypo. Children having motor activities limitations due to autism spectrum disorder make them deprive of opportunity to interact and learn. The alterations affect and interfere with the quality of life of individuals with ASD, for which reason it is fundamental that they are considered during the process of evaluation and diagnosis and when planning interventions and support, to promote participation and independence among people with ASD in social, educational, workplace, and community life. Autism spectrum disorders (ASDs) constitute one of the major developmental disabilities<sup>7</sup>.

Children with autism spectrum disorder (ASD) often face challenges in fine motor activities, turning even simple tasks like buttoning a sweater into a significant test for them. Additionally, they may exhibit a dislike for certain textures in clothing. Limited research has been conducted on the impact of sensorimotor challenges on daily living skills in children with ASD. Understanding the connection between sensorimotor abilities and everyday skills is crucial for addressing the specific needs of children with ASD, enabling them to better integrate into social environments.

## **Methodology:**

### **STUDY DESIGN:**

Quasi-Experimental

### **SOURCE OF DATA:**

Data for this study is drawn from the Livvey Wings Foundation.

### **SAMPLE SIZE:**

The determined sample size, guided by a statistical expert, is 40.

### **SAMPLING TECHNIQUE:**

Convenient sampling technique is adopted for the collection of samples.

### **METHOD OF DATA COLLECTION:**

The primary method for gathering data involves direct acquisition from both the educational institution and the centre. Prior approvals have been obtained from the school authorities and the parents of participating children.

### **INCLUSION CRITERIA:**

- Children within the age range of 12-16 years.
- Children diagnosed with autism spectrum disorder (ASD).
- Children capable of reading and comprehend words.
- Children capable of following instructions.

### **EXCLUSION CRITERIA:**

- Children with additional co-morbid conditions.
- Children unable to read and comprehend words.
- Children exhibiting severe levels of ASD.

### **OUTCOME MEASURE**

1. WaismanActivitiesofdailyLivingScale

## Procedure

The 12-week structured multi-sensory program will be implemented with 40 minutes per session. During each session, children with ASD will be assigned the same therapist, and each session will be conducted same content and routine to provide the participants with a sense of consistency. The intervention groups will complete the pre-test 1 week before the intervention program began. The post test will be administered one week after the 12-week intervention program.

## Data Analysis

The data has been collected and entered in M S excel 2010. Different statistical analysis has been performed using STATA MP-17. Normally distributed data has been analysed using parametric test and t- test.

## Result

This study was based on impact of multi-sensory approach to improve ADL among autistic children. A sample size of 40 autism children was selected using convenient sampling.

**Table 1: Descriptive Statistics**

Stats	W ADL	
	<i>Pre</i>	<i>Post</i>
Mean	11.55	24.2
Standard Error	0.438456	0.727834864
Standard Deviation	2.773039	4.603231864
Sample Variance	7.689744	21.18974359

In the pre-test, the mean value was 11.55, which increased significantly to 24.2 in the post-test. Similarly, the standard error rose from 0.436456 to 0.727834864, and the standard deviation increased from 2.773039 to 4.603231864 in the post-test.

These statistical changes collectively suggest a significant improvement in the performance of Activities of Daily Living (ADL) among children on the autism spectrum. The multi-sensory approach implemented played a crucial role in facilitating these positive changes for children with ASD. Specifically, the specialized sessions and application of diverse techniques led to a marked improvement in visual activity, enhancing the children's ability to visualize and comprehend both visual and real-world contexts.

The examination aimed to determine whether the null hypothesis would be accepted or rejected. In the post-test, the calculated p-value was less than 0.05, exceeding the significance threshold of 0.05. Therefore, the statistical findings are considered significant ( $p < 0.05$ ), leading to the acceptance of the alternate hypothesis ( $H_0$ ). This acceptance suggests that the multi-sensory approach has a significant effect on enhancing ADL performance in children with autism spectrum disorder.

P-value is less than the 0.05 significant level where  $\{p < 0.05\}$  in this case the null hypothesis will be rejected and alternative hypothesis will be accepted which means there is an improvement post- W-ADL..

## Discussion

The purpose of the study was to analyze effectiveness of multi-sensory approach for ADL among children with autism, the result of the proved that after the statistical analysis. The results of the study proves the acceptance of alternate hypothesis and rejection of null hypothesis.

Examining statistical outcomes related to ADL performance pre and post-activity, the mean values increased from 11.55 to 24.22, with corresponding rises in standard error (0.438456 to 0.727834864) and standard deviation (2.773039 to 4.603231864). These observed increments indicate an enhancement in performance capabilities among children with Autism Spectrum Disorder (ASD). The improvement in daily living activities, encompassing listening, focus, and attentiveness, signifies overall progress in the children's skills and knowledge.

The p-value associated with W- ADL, calculated as 0.04, exceeded the predetermined threshold of 0.05 ( $p < 0.005$ ), leading to the acceptance of the alternate hypothesis and the rejection of the null hypothesis regarding daily living activity. These results highlight an enhancement in ADL independence, contributing to the advancement of the children's skills and knowledge.

Humaira Waseem (2021) study on Daily Living Tasks Affected by Sensory and Motor Problems in Children with Autism Aged 5-12 Years. The study was conducted in rehab care and special school. Study design was cross sectional and data collection was done by purposive sampling technique. The study duration was 4 months and total 60 number of candidates was considered for the study with required age. They used sensory profile questionnaire based on Ayer's sensory integration theory and another tool used was Barthel index scale for scaling. The study concluded that auditory and tactile processing disorder are affecting the in the activities of daily performances of the children<sup>32</sup>.

Result of data analysis revealed that there is significant effect of multi-sensory approach on daily living skills. This means that by using multi-sensory approach overtime can lead to sustained improvement in their ability to perform ADLs independently and enhance their overall quality of life.

## Conclusion

The comprehensive analysis of multi-sensory approach outcomes collectively supports the positive impact of a multi-sensory approach in promoting skill development and enhancing the daily lives of children with autism spectrum disorder. These findings contribute valuable insights to educational and therapeutic interventions tailored to address the unique needs of this population, emphasizing the significance of incorporating multi-sensory strategies in fostering holistic progress.

## Limitations of the Study:

1. Small Sample size only restricted to 40.
2. Further research is required to investigate the practical applicability and development of effective service programs based on this theoretical perspective.

## RECOMMENDATIONS

1. In order to, achieve more effective results, a greater number of samples should be included.
2. For future studies, it is recommended to consider including children from the age of 10.
3. The scope of the study could be expanded.

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