



Assesment of adaptive behavior in children using Vineland Adaptive Behavior Scale III in autism spectrum disorder

Dr. Manasi Rutika Ramakant Pawar¹, Dr. Pranjal Grover²

¹ TMV's Lokmanya Tilak College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India

² Principal and Professor, TMV's Lokmanya Tilak College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India

Corresponding Author: Dr. Manasi Ramakant Pawar

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Abstract

Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that can affect communication, social interaction, and daily functioning. Difficulties in adaptive Behavior may influence a child's independence and participation in everyday activities. Assessing adaptive Behavior helps identify individual strengths and areas requiring support. The Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), provides a structured assessment of adaptive functioning and can support individualized rehabilitation planning.

Aim: To assess adaptive Behavior in children with Autism Spectrum Disorder using the Vineland Adaptive Behavior Scales, Third Edition.

Methods: A descriptive observational study was conducted among 79 children with ASD. Adaptive Behavior was assessed using the Vineland-3 Parent/Caregiver Form across Communication, Daily Living Skills, Socialization, Motor Skills, and the Adaptive Behavior Composite (ABC). Data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations. The Shapiro–Wilk test was used to assess the normality of the standard scores.

Results: The mean age of participants was 5.78 ± 1.48 years. Daily Living Skills demonstrated the highest mean standard score (105.14 ± 11.24), whereas Motor Skills showed the lowest (93.88 ± 11.63). The mean ABC score was 99.26 ± 12.29 . Regarding adaptive Behavior classification, 57.0% of children were categorized in the below-average range, 12.7% had significant adaptive deficits, 18.8% were in the average range, and 12.5% were in the above-average range. The Shapiro–Wilk test indicated no statistically significant departure from normality for Communication ($p = 0.764$), Daily Living Skills ($p = 0.331$), Socialization ($p = 0.161$), Motor Skills ($p = 0.524$), or the ABC ($p = 0.447$).

Conclusion: The findings demonstrate variation in adaptive functioning among children with ASD, with differences across individual domains. Although Daily Living Skills had the highest mean score, Motor Skills had the lowest, highlighting the importance of evaluating specific functional abilities alongside overall adaptive functioning. From a physiotherapy perspective, understanding motor-related adaptive skills may help identify everyday activity limitations and participation needs. These findings support the importance of individualized, function-oriented rehabilitation planning to promote independence and daily functioning. However, the results should be interpreted considering the sample size and descriptive study design.

Keywords: Autism Spectrum Disorder, adaptive behavior, Vineland Adaptive Behavior Scales, Third Edition, communication, daily living skills, motor skills, physiotherapy

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by difficulties in social communication, interaction, and adaptive functioning. These challenges may persist with age and occur independently of intellectual ability, affecting children's independence and participation in everyday activities. The clinical heterogeneity of ASD highlights the need for multidimensional assessment and individualized intervention planning. A systematic review of ASD prevalence in India reported estimates of approximately 0.09% in urban children and 0.11% in rural children, while emphasizing the need for high-quality, large-scale studies to establish more reliable prevalence estimates.

The Vineland Adaptive Behavior Scales (VABS) is widely used to assess adaptive functioning in children with ASD. Conventional intelligence tests may not adequately capture everyday functional abilities because social communication difficulties and associated Behavioral challenges can influence test performance. The Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), assesses

Communication, Daily Living Skills, Socialization, and Motor Skills, along with the Adaptive Behavior Composite (ABC), using information obtained from parents or caregivers. These measures help identify individual strengths and limitations, support clinical assessment, and guide personalized intervention planning. Research has also examined meaningful changes in Vineland composite scores, with reported changes of 4–8 points in the Adaptive Behavior Composite and the Communication–Socialization two-domain composite considered meaningful for children and adolescents with ASD without intellectual disability.

Despite its widespread clinical use, concerns remain regarding the interpretation of Vineland-3 scores in individuals with neurodevelopmental disabilities. Comparative research has reported lower scores on Vineland-3 than on Vineland-II in many individuals, particularly in Communication, highlighting the importance of careful interpretation across versions. Further investigation of adaptive functioning can help clarify domain-specific needs and support appropriate clinical decision-making.

From a physiotherapy perspective, assessing motor-related adaptive functioning is particularly relevant because it may provide insight into children's everyday activity and participation needs. However, adaptive abilities vary considerably among children with ASD, making it important to examine individual domains alongside overall functioning. Therefore, this study aims to assess adaptive Behavior in children with ASD using the Vineland-3, describe their functioning across domains, and identify areas that may inform individualized, function-oriented rehabilitation planning. The findings may contribute to a better understanding of adaptive functioning and support the development of interventions that promote independence and participation in daily life.

Methods

Study Design

The study employed a descriptive cross-sectional design to assess adaptive Behavior in children with Autism Spectrum Disorder (ASD) at a single point in time. This design was selected to describe functioning across the different domains of the Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), and the overall Adaptive Behavior Composite.

Study Setting

Participants were recruited from Divyang Special School, Navi Mumbai, and Little Krishna Child Rehabilitation Centre, Ulve.

Participants and Sampling

The study included 79 children with a clinical diagnosis of ASD. Participants were between 3 and 8 years of age. Participants for recruited using convenience sampling. The final sample consisted of children who fulfilled the predetermined eligibility criteria and completed the necessary assessments.

Inclusion Criteria

- Clinically diagnosed with Autism Spectrum Disorder (ASD) based on DSM-5 criteria.
- Participants age 3 yrs to 8 yrs.
- Able to understand and communicate in the language of the assessment.
- Informed consent obtained from parents/guardians.

Exclusion Criteria

- Inability to complete the Vineland-3 due to severe sensory or motor impairments.
- Severe intellectual disability with no communication skills, preventing accurate assessment
- No confirmed diagnosis of ASD.

Outcome Measures

Vineland Adaptive Behavior Scales – 3 (Vineland-3) – Parent/Caregiver Form

The Vineland Adaptive BEHAVIOR Scales–Third Edition (Vineland-3) Parent/Caregiver Form is a standardized assessment tool used to evaluate the everyday adaptive functioning of individuals from birth to adulthood. It is completed by a parent or primary caregiver and measures

key domains such as Communication, Daily Living Skills, Socialization, and Motor Skills. The Vineland-3 helps clinicians, educators, and therapists understand how a person functions in real-life settings and supports diagnosis, intervention planning, and progress monitoring.

Reliability: 95%

Validity: 80%

Ethical Considerations

Institutional approval was obtained from the Ethics Committee of TMV's Lokmanya Tilak College of Physiotherapy, Kharghar before commencement of the study. Parents/caregivers were provided with information regarding the study and written informed consent was obtained. Participation was voluntary and confidentiality of participant information was maintained.

Procedure

Potential Participants were screened according to the inclusion and exclusion criteria. After confirming eligibility, written informed consent was obtained from the parents or caregivers. Adaptive BEHAVIOR was assessed using the Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), Parent/Caregiver Form. The collected data were entered into Microsoft Excel and checked for accuracy. Descriptive statistical analysis was performed to summarize the findings.

Statistical Analysis

The descriptive analysis revealed variations in adaptive Behavior among children with ASD. Daily Living Skills had the highest mean Standard Score (105.14 ± 11.24), while Motor Skills had the lowest (93.88 ± 11.63). The mean ABC score was 99.26 ± 12.29 . Overall, 57.0% of participants demonstrated below-average adaptive BEHAVIOR and 12.7% had significant adaptive deficits, while 18.8% showed average and 12.5% above-average adaptive Behavior. These findings highlight adaptive functioning difficulties in a substantial proportion of children with ASD.

Results

Participant Characteristics

A total of 79 children with Autism Spectrum Disorder were included in the present study. The mean age of the participants was 5.78 ± 1.48 years, with an age range of 3.2 to 8.0 years. Among the 79 participants, 42 (53.16%) were females and 37 (46.84%) were males.

Table 1: Distribution of Participants According to Age and Gender

Variable	Frequency / Value
Total participants	80
Mean age $\pm$ SD	5.78 ± 1.48 years
Minimum age	3.2 years
Maximum age	8.0 years
Female	42 (53.16%)
Male	37 (46.84%)

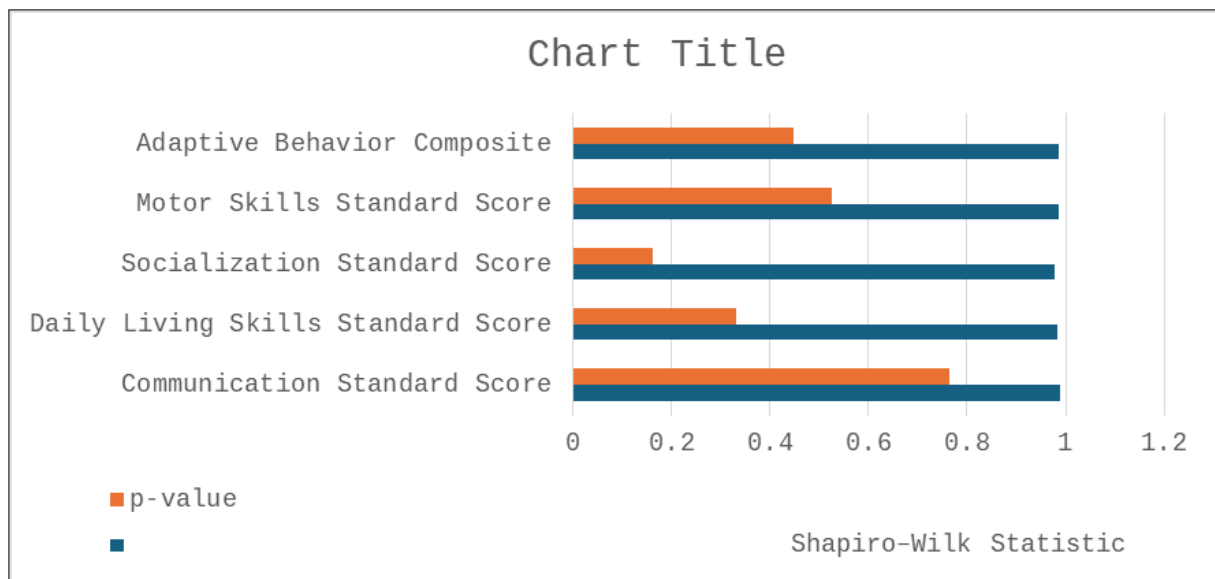
Normality Testing

The Shapiro–Wilk test was used to assess the normality of the continuous Vineland-3 scores.

Table 2: Shapiro–Wilk Test for Normality

Variable	Shapiro–Wilk Statistic	p-value
Communication Standard Score	0.990	0.764
Daily Living Skills Standard Score	0.982	0.331

Socialization Standard Score	0.977	0.161
Motor Skills Standard Score	0.986	0.524
Adaptive behavior Composite	0.985	0.447

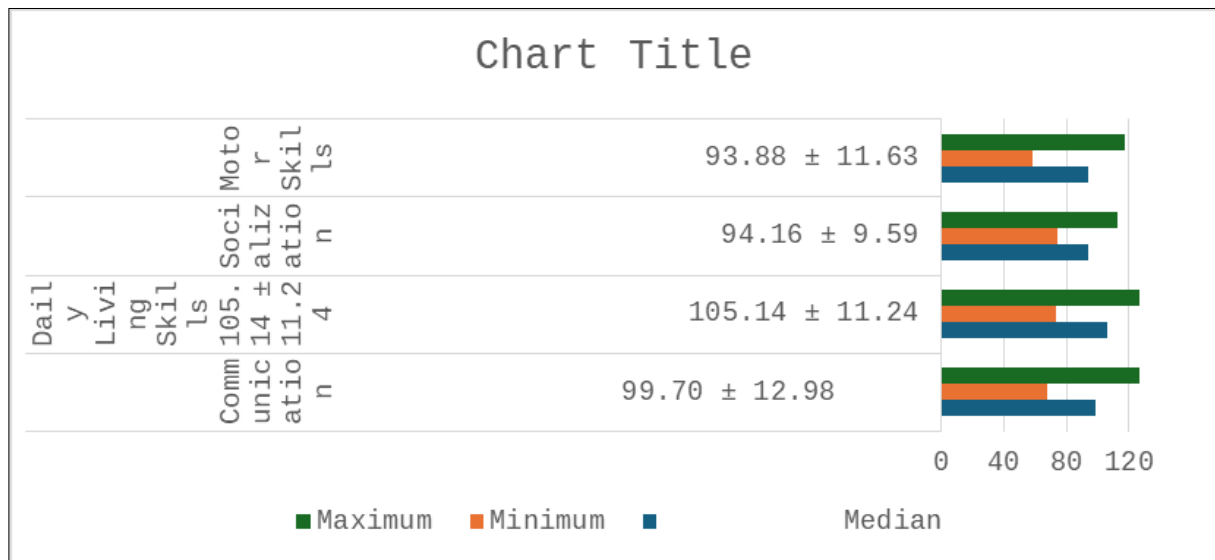


Descriptive Statistics of Vineland-3 Domain Scores

The descriptive statistics of the Vineland-3 Standard Scores for the four domains are presented in Table 1.3

Table 3: Descriptive Statistics of Vineland-3 Domain Standard Scores

Vineland-3 Domain	Mean $\pm$ SD	Median	Minimum	Maximum
Communication	99.70 $\pm$ 12.98	99.0	68	127
Daily Living Skills	105.14 $\pm$ 11.24	106.5	73	127
Socialization	94.16 $\pm$ 9.59	94.0	74	113
Motor Skills	93.88 $\pm$ 11.63	94.0	58	117

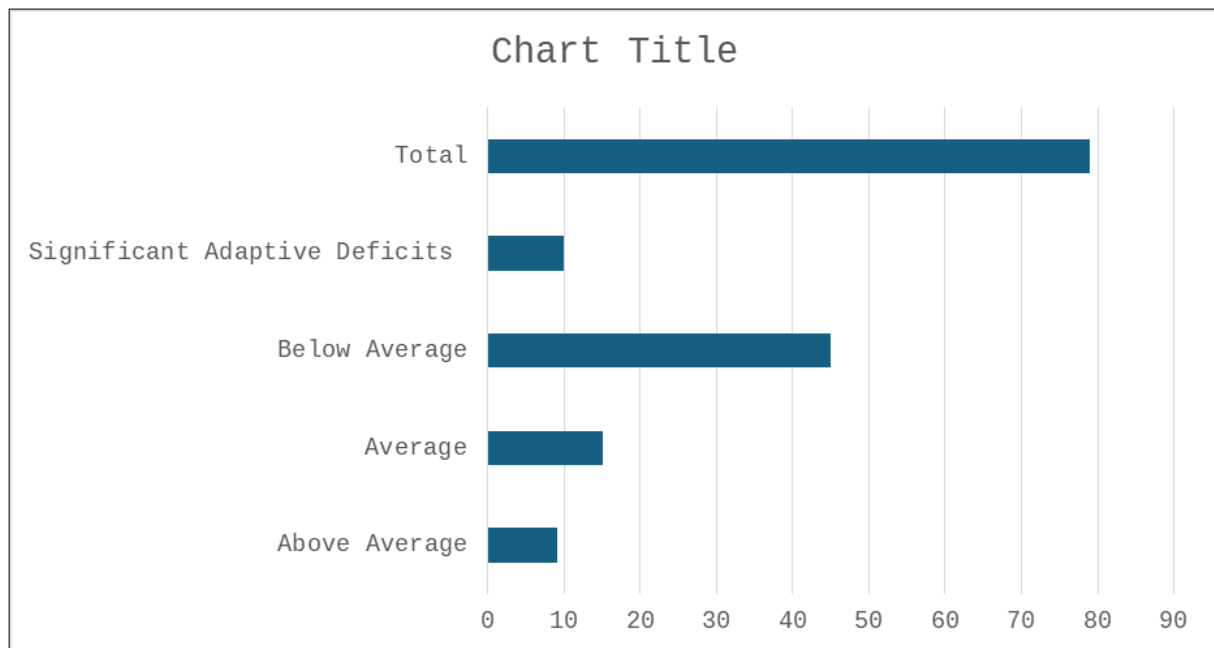


Distribution According to Overall Adaptive Behavior Interpretation

The participants were categorized according to their overall adaptive behavior interpretation based on the ABC classification used in the study.

Table 4: Distribution of Participants According to Adaptive BEHAVIOR Interpretation

Interpretation	Frequency (n)	Percentage (%)	Cumulative Percentage (%)
Above Average	9	11.4	11.4
Average	15	19.0	30.4
Below Average	45	57.0	87.3
Significant Adaptive Deficits	10	12.7	100.0
Total	79	100.0	



Discussion

The present study assessed adaptive functioning in 79 children with Autism Spectrum Disorder (ASD) using the Vineland Adaptive Behavior Scales, Third Edition (Vineland-3). The mean age was 5.78 ± 1.48 years. Daily Living Skills had the highest mean Standard Score (105.14 ± 11.24), followed by Communication (99.70 ± 12.98), Socialization (94.16 ± 9.59), and Motor Skills (93.88 ± 11.63). The mean Adaptive Behavior Composite (ABC) score was 99.26 ± 12.29 . These findings indicate variation in adaptive functioning across domains, with Daily Living Skills emerging as a relative strength and Motor Skills as a relative area of difficulty. Adaptive behavior assessment provides valuable information about children's everyday abilities and independence.

A major finding was that 45 children (57.0%) demonstrated below-average adaptive behavior, while 10 (12.7%) had significant adaptive deficits. Overall, 55 children (69.6%) demonstrated adaptive functioning below the average range, whereas 15 (19.0%) showed average and 9 (11.4%) showed above-average functioning. Although the mean ABC score was close to the normative mean, the wide score range (70–124) highlighted individual differences in functional abilities. Previous studies have similarly emphasized the variability of adaptive functioning in children with ASD and the influence of communication, language and individual characteristics. [1, 5, 9] As no inferential comparisons were performed, the differences between domain scores should be interpreted descriptively rather than as statistically significant differences.

The findings highlight the importance of assessing adaptive functioning across multiple domains rather than relying solely on the overall ABC score. Vineland-3 can help identify individual strengths and difficulties and support individualized intervention goals targeting communication, self-care, social participation and motor functioning. Cultural practices and opportunities within the child's environment should also be considered when interpreting adaptive scores, particularly in the Indian context. Overall, the study emphasizes the clinical value of comprehensive adaptive behavior assessment in understanding functional needs and guiding interventions aimed at improving

everyday participation and independence among children with ASD.

Limitations

- The small sample size and purposive sampling may limit the generalizability of the findings.
- The study was restricted to children aged 3–8 years from selected rehabilitation and special-school settings in Navi Mumbai.
- The cross-sectional design and caregiver-reported assessments may introduce reporting bias and do not capture changes in adaptive behavior over time.

Future Scope

- Future studies should include larger, multicenter samples and representative sampling methods to improve generalizability.
- Longitudinal studies should assess changes in adaptive behavior across different age groups and developmental stages.
- Further research should evaluate the effectiveness of physiotherapy and rehabilitation interventions on adaptive functioning.
- Studies should examine the cultural applicability of Vineland-3 in Indian children with ASD and the need for appropriate Indian norms.

Conclusion

The present study assessed adaptive BEHAVIOR in 79 children with Autism Spectrum Disorder (ASD) using the Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), revealing considerable variation in functional abilities. Daily Living Skills had the highest mean Standard Score (105.14 ± 11.24), whereas Motor Skills had the lowest (93.88 ± 11.63). The mean Adaptive Behavior Composite (ABC) score was 99.26 ± 12.29 , with scores ranging from 70 to 124. Overall, 57.0% of children demonstrated below-average adaptive behavior, while 12.7% had significant adaptive deficits, indicating that 69.6% fell within these two categories. These findings highlight the importance of comprehensive adaptive behavior assessment to identify individual strengths and

difficulties and help physiotherapists and rehabilitation professionals develop individualized, function-oriented interventions to improve independence and participation in daily life.

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