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Feasibility and Short-Term Behavioral Change Following Structured Home-Based Intervention in Children with Autism Spectrum Disorder: A Quasi-experimental Study

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Abstract

Background: Autism Spectrum Disorder (ASD) is a heterogenous neurodevelopmental condition with increasing prevalence in India. Access to intensive, center-based interventions remains limited in low resource settings. This necessitates scalable caregiver mediated approaches like Home-Based Intervention (HBI).

Objective: To evaluate short-term changes in ASD domains (Social, Behavioral, Communication and Sensory) outcomes following a structured HBI program in young children with ASD.

Methods: A quasi experimental pre-post study design was used. Forty-eight children aged 2–6 years diagnosed with ASD underwent a structured individualized caregiver implemented HBI plan (mention duration). Behavioural outcomes were assessed Pre- and post-intervention using the Trivandrum Autism Behavior Checklist (TABC). Additional data on sleep profile, screen time, age, and gender were analyzed.

Results: A significant mean reduction in TABC scores was observed post-intervention (mean change: 8.79 ± 5.2; $p < 0.0001$). Mean screen time was 3.85 hrs/day and average sleep duration was 10.59 hrs/day. No significant correlation was found between baseline TABC score and screen time or sleep profile.

Conclusion: Structured HBI may be a feasible and beneficial strategy in reducing autism related behaviours in resource constrained settings with notable behavioral improvements over time.

Keyword: ASD; TABC; Home-Based Intervention model; Screen-time; Sleep profile

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder affecting communication, behavior, and social skills.

Reference: American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders, 5th edn American Psychiatric Publishing, Arlington [Google Scholar].

India's ASD prevalence is rising, yet access to structured therapies remains scarce in rural and semi-urban areas. Despite growing evidence supporting early intervention in ASD, scalable and culturally adaptable intervention models suitable for low-resource settings remain underrepresented in routine clinical practice. Home-Based Interventions (HBI), guided by structured plans, can

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empower caregivers to engage in behaviorally driven therapy at home. This pilot study aimed to evaluate the impact of such an intervention on children diagnosed with ASD using a validated tool, TABC [1].

Methods

Data from 48 children with ASD undergoing home-based intervention were analyzed. The home-based intervention package was based upon the "MKC home based package tool" developed at NIMS Spectrum CDRC, under the guidance of Prof. (Dr.) MKC Nair. Based on ABA model this tool targets various items in the domain of Social interaction, Communication, Behaviour and Sensory Integration. The parents were provided with the individualized home-based model post evaluation after proper explanation [2]. The same was sent on mobile number for a quick reference. Parents were given a formal training in each domain by registered Occupational therapist, Speech and Language Pathologist and Psychologist. They were asked to implement the plan at the comfort zone of home-facilities atleast 4 hours per/day, not in a continuous session but in divided hours. Core Components or activities included the items the child was found deficit on TABC scores. They were then asked to follow-up telephonically at regular intervals (advised on every 15th day). They were then asked to follow-up in person for re-evaluation after completion of 12 weeks of home -based intervention. The primary outcome was the change in TABC scores (Previous Score – Latest Score). Variables included: Age, Gender, Duration of intervention (in months), Screen time (hours/day), and Sleep profile (hours/night). Statistical analyses included descriptive statistics, Pearson's correlation, t-tests, and subgroup analysis by age groups [3].

Study Design: Experimental pre-post comparison pilot study.

Participants: Children aged 2–6 years referred for suspected ASD at three centers in Jharkhand.

The participants for this study were parents of children diagnosed with ASD; specific inclusion criteria included:

- Children were between 2 to 6 years of age.
- No previous diagnosis of ASD was made.
- The child has not received any Home-Based Intervention plan previously.

Exclusion Criteria: Parents not willing/ not giving consent.

Screening and Diagnosis: All children were screened with TABC and confirmed by CARS-2-ST. The assessment was conducted by trained Developmental Pediatrician. HBI was delivered based on affected domains.

Outcome Measures: TABC scores before and after 8–12 weeks of HBI. Secondary variables included age, gender, screen time, and sleep profile.

Statistical Analysis: Paired t-test, descriptive statistics, and Pearson correlation were performed using Python libraries.

Results

A total of 48 children (85.4% male and 14.6% female) completed the intervention and follow-up assessments. Male-female ratio being 5.85:1 is a bit higher in our studies in comparison to what is seen in other studies i.e 4:1. The mean age was 3.33 ± 1.03 years [4].

Average sleep duration was 10.59 ± 0.9 hours/day and average screen time was 3.85 ± 1.6 hours/day. Average screen-time was significantly higher from the recommended value as per WHO guidelines (It recommends an average of 1 hour of screen time for children 2-5 years of age).

The mean TABC score was significantly reduced after the intervention (mean change = 8.79, SD = 5.2; t = 11.71, $p < 0.0001$) (Figure 1).

Mean Previous Score	46.0
Mean Latest Score	37.2
Average Improvement	8.8

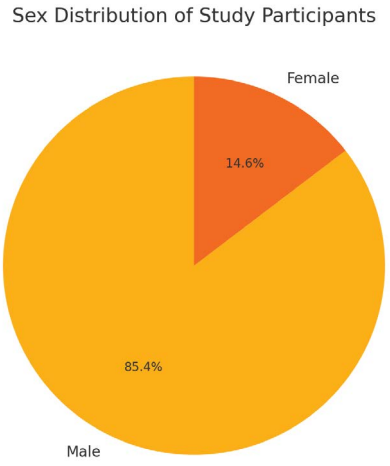

Figure 1: Sex distribution among participants.

This score reveals a consistent improvement which is statically significant post home-based intervention strategy [5] (Figure 2 and 3).

Correlation analysis showed no significant relationship between the initial TABC scores and screen time (r = 0.072, p = 0.625) or sleep profile (r = -0.102, p = 0.489). A weak non-significant trend was found on longer intervention duration associated with less improvement (r = –0.23, p = 0.12) (Table 1).

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Table 1: Summary of Age, Screen Time, and Sleep Duration by Sex.

Sex	Mean Age (yrs)	Screen Time (hrs)	Sleep Duration (hrs)
Male	3.33	3.90	10.57
Female	3.33	3.57	10.71

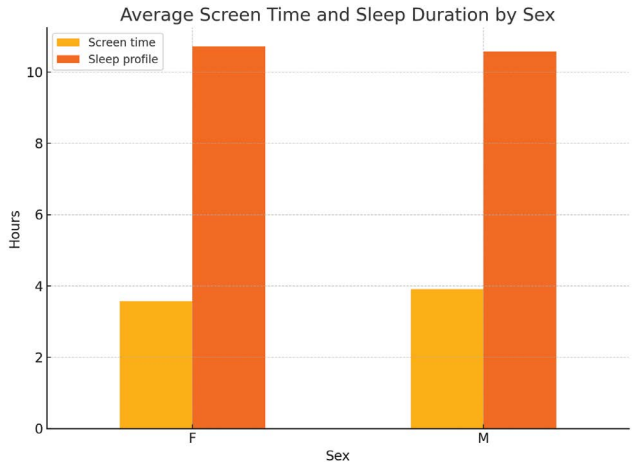

Figure 2: Average screen time and sleep duration by sex.

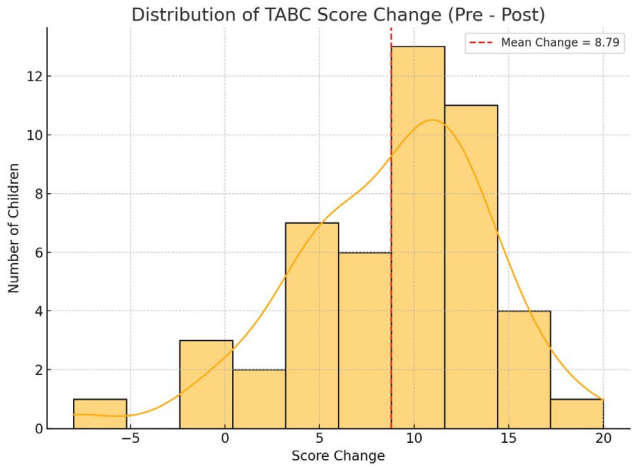

Figure 3: Histogram showing distribution of TABC Score Change.

Age Subgroup Analysis:

Age Group	Participants	Mean Improvement
2 yrs	3	9.0
2–3 yrs	23	9.0
3–4 yrs	15	9.3
4–5 yrs	3	6.7

Children below 4 years showed slightly better improvements, suggesting earlier initiation may be beneficial.

Discussion

This study demonstrates that a structured home-based, parent-mediated intervention program can significantly improve TABC outcomes in children with ASD. The findings support the practical value of empowering caregivers with structured training and routine-based goal implementation, particularly in regions where intensive therapist-led services may be limited. Improvements across multiple domains suggest that caregiver-led intervention may enhance Communication, Social-adaptive behaviors, and reduce problematic behavior patterns by providing consistent reinforcement and predictable routines in the child's natural environment [6]. The study aligns with broader evidence supporting parent-mediated interventions and naturalistic developmental behavioral interventions (NDBI), highlighting feasibility, scalability, and cultural adaptability in Indian settings. While screen time and sleep are modifiable lifestyle factors, their baseline correlation with autism severity was not statistically significant in this study. The findings align with the global emphasis on early intervention and caregiver involvement in autism management, especially in resource-constrained settings [7].

Strengths: This study gives an opportunity for real-world clinic-to-home translation. A structured follow-up and a standardized outcome measure help us to assess the improvement pattern.

Limitations: This was a pre–post design without control group. This is definitely a possibility of potential caregiver reporting bias, variable therapy co-interventions, and limited longer-term follow-up.

Future controlled studies with blinded assessment and long follow-up are recommended.

Conclusion

Home-Based Intervention is a feasible and effective approach in resource-constrained settings for children with ASD. It empowers parents and shows measurable behavioral benefits over a short-term follow-up. Further large-scale studies are recommended.

References

1. Chauhan A, Sahu JK, Jaiswal N, et al. Prevalence of Autism Spectrum Disorder in Indian Children: A Systematic Review and Meta-analysis. Neurology India (2019).
2. George B, Leena ML, Nair MKC. Autism Spectrum Disorders-Aetiopathogenesis. Journal of Clinical and Diagnostic Research 12 (2018): SE01-SE05.
3. Nair MKC, et al. Development of TABC. TEENS 7 (2013): 4-10.

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Kumar S, et al., J Pediatr Perinatol Child Health 2026
DOI:10.26502/jppch.74050234

4. Nair MKC, Russell PSS, George B, et al. Effectiveness of a Clinic Based, Low Intensity, Early Intervention for Children with Autism Spectrum Disorder in India: A Naturalistic Observational Study. Indian Journal of Pediatrics 81 (2014): 110-114.

5. Dieleman LM, Moyson T, De Pauw SSW, et al. Parents' Need-related Experiences and Behaviors When Raising a Child with Autism Spectrum Disorder. Journal of Pediatric Nursing (2018).

6. Galpin J, Barratt P, Ashcroft E, et al. 'The Dots Just Don't Join Up': Understanding the Support Needs of Families of Children on the Autism Spectrum. Autism 22 (2018): 571-584.

7. Bearss K, Burrell TL, Stewart L, et al. Parent Training in Autism Spectrum Disorder: What's in a Name? Clinical Child and Family Psychology Review 18 (2015): 170-182.

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SUPPLEMENTARY FILES

TRIVANDRUM AUTISM BEHAVIOURAL CHECKLIST (TABC)

		Never (1)	Sometimes (2)	Often (3)	Always (4)
Social Interaction (5 items)					
a.	Inability to establish/maintain eye contact				
b.	Child does not respond when called, sometimes appears to be deaf				
c.	Difficulty in mixing and playing with other children of the same age				
d.	Lack of appropriate emotional response				
e.	Can do certain tasks well, but not the tasks involving social understanding				
Communication (4 items)					
a.	Difficulty in comprehension /communication				
b.	May/may not indicate wants by gestures or leading adults by the hand				
c.	Echolalia/using nonsensical words and muttering to self				
d.	Lack of pretend play				
Behavioural Characteristics (5 items)					
a.	Like sameness in everyday routine				
b.	Inappropriate attachments to objects				
c.	Unusual body movements such as flapping hands or rocking and jumping				
d.	Extreme restlessness, hyperactivity/over passivity or prefers to be alone all the time				
e.	Not responsive to normal teaching methods				
Sensory Integration (6 items)					
a.	Doesn't like to be hugged or touch/apparent insensitivity to pain				
b.	Intolerance/ Addiction to certain sounds, tastes, odours, visuals				
c.	No understanding of fear of real dangers/Excessive fear of heights, change in position				
d.	Enjoys spinning or rotating objects				
e.	Inappropriate laughing and giggling/Crying spells with extreme distress for no apparent reasons				
f	Difficulty in fine motor skills. A tendency to fall/ clumsiness/ resistance to new motor movement activities.				

Ref : Nair MKC, et al. Development of TABC. TEENS 2013; 7(1): 4 – 10. Published by CDC Kerala

SCORING: 20 – 35: Non Autistic; 36 – 43: Mild – Moderately Autistic; 44 and Above: Severely Autisitic

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