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Association Between Screen Dependency and Developmental Characteristics in Young Children with Autism Spectrum Disorder

Ameesh Prakash[1], Dr. Satish Kumaraswamy[2]

[1]Post Graduate student (MASLP), [2]PhD in Speech and Hearing, Professor & Principal

[1,2]Dr. M.V Shetty College of Speech and Hearing, Malady Court, Kavoor, Mangalore 15. Mangalore University

Abstract

While digital media preference is common in Autism Spectrum Disorder (ASD), excessive screen exposure may displace critical interactive opportunities. This descriptive cross-sectional study evaluated screen dependency and its developmental correlates among 30 children with ASD (aged 2–5 years) in Delhi NCR. Chi-square analysis revealed significant associations between high screen exposure and behavioral management variables such as tantrums upon device removal (83.3%) and a preference for screens over toys (70.0%) as well as environmental constraints like reduced outdoor play (70.0%) Crucially, screen dependency was not significantly associated with core ASD developmental features, including echolalia ($p = .856$) and avoidant eye contact ($p = .362$). Furthermore, Pearson correlation analysis revealed that the linear relationship between overall screen dependency and speech intelligibility was not statistically significant ($r = .34$, $p = .067$). The findings suggest that screen dependency in young children with ASD is primarily linked to behavioral disruption and environmental routine imbalances rather than variations in core neurodevelopmental symptom severity.

Keywords: Autism Spectrum Disorder, screen dependency, screen time, speech intelligibility, developmental characteristics, children, Delhi NCR

1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that affects social communication, interaction, and behavior. Children with ASD may experience difficulties in understanding social situations, maintaining eye contact, and using language effectively. Early childhood plays an important role in brain development, as children develop communication, cognitive, and social skills during this period (Dawson, 2008). Experiences during these early years can influence overall growth and development.

In recent years, the use of smartphones, tablets, televisions, and other digital devices has increased considerably among young children. Many children spend a large amount of time watching videos, playing

games, or engaging in screen-based activities (Madigan 2022). Children with ASD may show greater interest in digital media because it often provides repetitive and visually stimulating content. Mazurek and Wenstrup (2013) reported that children with ASD spent more time using screen-based media compared to typically developing children. Although certain educational programs may support learning, excessive screen exposure is frequently associated with fewer reported opportunities for communication, social interaction, and play-based activities. Previous studies have reported a relationship between increased screen exposure and developmental concerns in children. Chonchaiya and Pruksananonda (2008) found that high television exposure was associated with delayed language development.

Dong (2021) observed that preschool children with ASD had higher screen time than other children and also demonstrated greater behavioral difficulties. Similarly, Heffler (2020) suggested that increased screen exposure during infancy, along with limited caregiver interaction, may be related to autistic-like behaviors and sensory-seeking patterns.

Excessive screen use co-occurs with variations in attention, sleep, behavior, and social participation (Lissak, 2018). Children who spend more time on screens may participate less in outdoor play, conversations, and face-to-face interaction. Christakis (2009) reported that increased digital media use was associated with reduced interpersonal communication and greater dependence on screen-based activities. In urban regions such as Delhi NCR, easy access to smartphones, busy family schedules, and limited outdoor play areas may contribute to increased screen exposure among children. Parents may also use digital devices during feeding, calming, or managing children's behavior at home.

Recent initiatives by NIMHANS SHUT Clinic (Service for Healthy Use of Technology) have highlighted increasing concerns regarding screen dependency among children. NIMHANS has reported a growing number of parents seeking professional guidance for excessive screen use, gaming addiction, and behavioral concerns related to digital media exposure. The institute also emphasized that excessive screen use may affect communication, physical activity, emotional regulation, and family interaction in young children.

Research focusing on screen dependency among Indian children with ASD remains limited. Zamir (2021) emphasized the importance of understanding screen-use patterns within families of children with ASD to encourage balanced media use. An Indian study by Bibi (2022) reported that children with ASD who spent more than two hours daily on screens demonstrated greater speech and communication difficulties compared to children with lower screen exposure. Sadeghi (2023) also found that higher screen dependency was associated with reduced social engagement in toddlers. Although digital media may sometimes support learning and entertainment, excessive use may reduce opportunities for communication, outdoor play, and social participation during early childhood.

2. Need for the Study

Delhi has reported high levels of smartphone usage which may contribute to increased screen exposure among children, leading to increased "passive parenting" via screens. According to the Telecom Regulatory Authority of India (TRAI, 2023), the Delhi service area recorded the highest tele-density in India at 273.67%. A study by Vivo India and CyberMedia Research (2023), covering over 1,500

respondents across major Indian cities, found that approximately 75% of parents admitted to using smartphones during the limited time spent with their children, raising concerns about digital distraction in family settings. Children with ASD may show greater interest in screens because digital media often includes repetitive and visually engaging content. While Western studies exist, there is a lack of localized research in the National Capital Region (NCR) addressing how Delhi's specific urban constraints (lack of play spaces, nuclear families) influence screen habits and ASD symptom severity.
Clinical Relevance: Understanding these correlates will help pediatricians in Delhi develop healthier screen-use guidelines for parents and children

3. Methodology

Aim of the Study

The present study aimed to examine screen dependency among children with Autism Spectrum Disorder (ASD) aged 2–5 years in Delhi NCR and to explore its relation to developmental characteristics.

Objectives of the Study

To determine the average daily screen time and age of first screen exposure among children with ASD aged 2–5 years.
To assess screen dependency, including screen use for feeding, sleeping, or calming.
To examine whether higher screen use was associated with delays in social communication, expressive language, and sensory regulation.
To identify environmental factors such as parental screen use and limited outdoor play that may contribute to screen dependency.

Subject

The target group for this study was parents or caregivers of children diagnosed with ASD and living in Delhi NCR. The sample included 30 parents.

4. Inclusion Criteria

Only children with a formal clinical diagnosis of ASD based on DSM-5 or ICD-11 criteria verified through a review of official pediatric, psychological, or clinical diagnostic documentation provided by the parents were selected. Exclusion Criteria

Exclusion Criteria

Children with severe visual or hearing impairment, uncontrolled epilepsy, traumatic brain injury, or a history of major neurosurgery were excluded.

Assessment Tools

The study used a 22-item parent-report questionnaire made up of two standardized tools. The first was the Screen Dependency Scale, developed by Abdul Hadi, Trakic-Juarez, and Nadar (2022), which contains

15 items and was used to assess screen-related habits and dependency. The second was the Intelligibility in Context Scale, developed by McLeod, Harrison, and McCormack (2012), which contains 7 items and was used to assess the child's speech intelligibility in different social settings.

5. Procedure

Participants were recruited from clinics across Delhi NCR. Parents or primary caregivers of eligible children were informed about the study, and written informed consent was obtained before participation. The questionnaire collected information related to screen-use habits, family background, and developmental characteristics of the child. Parents completed the questionnaire in a guided setting, allowing clarification of any doubts during data collection.

6. Statistical Analysis

To analyze the empirical data, descriptive statistics comprising frequencies and distributions were initially calculated to summarize the categorical variables derived from the Screen Dependency Scale (SDS) and the developmental indicator checklist. To evaluate localized associations among these categorical items, data were subjected to Pearson chi-square tests of independence. For continuous data parameters, a Pearson product-moment correlation coefficient (r) was computed to assess the linear relationship between the total aggregate scores of the SDS and the overall Intelligibility in Context Scale (ICS) metrics. The threshold for statistical significance across all inferential analyses was established a priori at $p < .05$.

7. Results and Discussions

The present study examined screen dependency and related developmental characteristics among children with Autism Spectrum Disorder (ASD) in Delhi. The findings obtained from the study are discussed below.

Table 1: Showing percentage score of Questions on evaluation Of Screen Dependency and its Developmental Correlates among Autistic Children (2–5 Years) in Delhi

Section	Item	*No (n)*	*No %*	*Yes*	*Yes %*	*p value*
Screen Exposure Habits	Screen Time > 2 hour	4	13.30 %	26	86.70%	<.001
Screen Exposure Habits	Screen Use During Meals	7	23.30 %	23	76.70%	.005
Screen Exposure Habits	Screen Use at Bedtime	10	33.30 %	20	66.70%	.099
Screen Exposure Habits	Independent Device Use	8	26.70 %	22	73.30%	.016
Behavioral Dependencies	Tantrum if Device Removed	5	16.70 %	25	83.30%	.001
Behavioral Dependencies	Negative Removal Reaction	6	20.00 %	24	80.00%	<.001
Behavioral Dependencies	Preference: Screen over Toys	9	30.00 %	21	70.00%	.043
Developmental Indicators	Poor Response to Name	11	36.70 %	19	63.30%	.20
Developmental Indicators	Poor/Avoidant Eye Contact	12	40.00 %	18	60.00%	.362
Developmental Indicators	Presence of Echolalia	14	46.70 %	16	53.30%	.856
Developmental Indicators	Presence of Stimming	13	43.30 %	17	56.70%	.585
Environmental & Clinical	Outdoor Play < 2 Hours	9	30.00 %	21	70.00%	.043
Environmental & Clinical	Sleep Struggles	11	36.70 %	19	63.30%	.20
Summary Status		5	16.70 %	25	83.30%	< .001

Analysis of the caregiver survey data revealed a distinct divergence between the children's daily behavioral routines and their core neurodevelopmental presentations. While a substantial majority of the sample (86.7%) exceeded two hours of daily screen exposure, chi-square tests of independence indicated that heavy screen dependency was strictly associated with routine-based disruptions rather than baseline autism features. Specifically, high device reliance was significantly linked to severe tantrums upon device removal (p = .001), screen usage during family meals (p = .005), and a clear reduction in physical activity via restricted outdoor play (p = .043). In contrast, no statistically significant associations emerged between screen habits and core clinical traits, including avoidant eye contact (p = .362), stimming (p = .585), or echolalia (p = .856). Furthermore, while a weak linear trend appeared between global screen dependency and functional speech clarity, a Pearson product-moment correlation confirmed this relationship was not statistically significant (r = .34, p = .067).

Table 2 presents the Intelligibility in Context Scale (ICS) results.

ICS Item	*Always n (%)*	*Usually n (%)*	*Sometimes n (%)*	*Rarely n (%)*	*Never n (%)*	*Mean*	*SD*	*Interpretation*
Immediate Family	7 (23.3%)	18 (60.0%)	5 (16.7%)	0 (0.0%)	0 (0.0%)	1.93	0.63	Good — usually understood
Extended Family	2 (6.7%)	12 (40.0%)	13 (43.3%)	3 (10.0%)	0 (0.0%)	2.57	0.76	Moderate — often understood
Neighbours	1 (3.3%)	3 (10.0%)	13 (43.3%)	11 (36.7%)	2 (6.7%)	3.33	0.87	Poor — sometimes understood
Teachers	1 (3.3%)	5 (16.7%)	19 (63.3%)	3 (10.0%)	2 (6.7%)	3	0.82	Poor — sometimes understood
Peers	0 (0.0%)	3 (10.0%)	11 (36.7%)	12 (40.0%)	4 (13.3%)	3.57	0.84	Very Poor — rarely understood
Strangers (Unfamiliar Adults)	0 (0.0%)	0 (0.0%)	7 (23.3%)	14 (46.7%)	9 (30.0%)	4.07	0.73	Very Poor — rarely understood
Overall Intelligibility	0 (0.0%)	7 (23.3%)	10 (33.3%)	12 (40.0%)	1 (3.3%)	3.23	0.84	Poor — sometimes understood

Speech intelligibility decreased as the listener became less familiar with the child. Family members reported better understanding (M = 1.93), while lower intelligibility was observed with teachers (M =

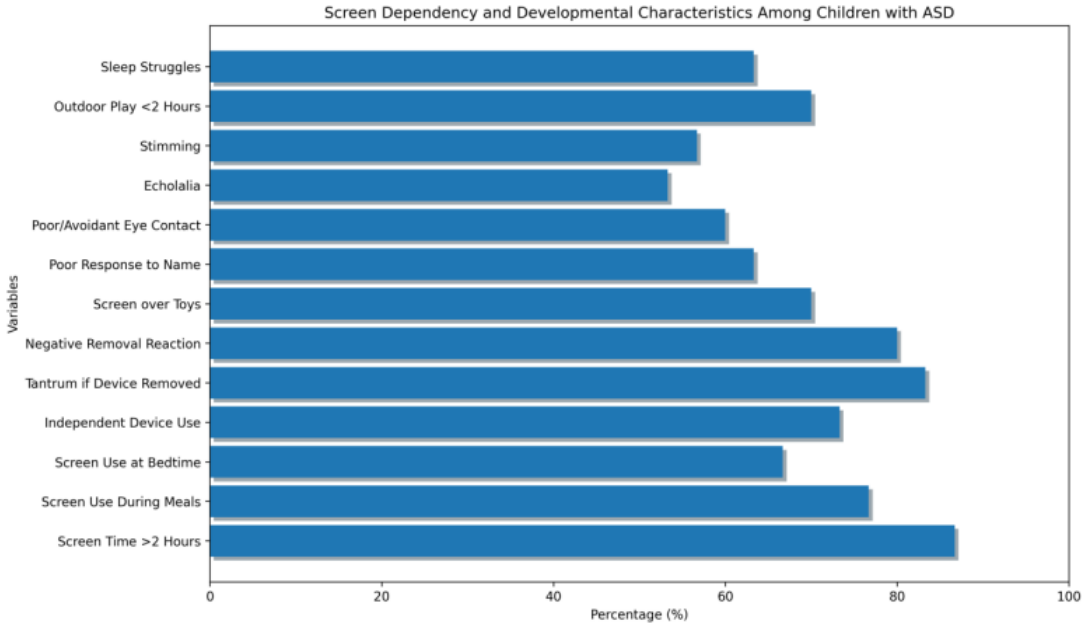
3.00), peers (M = 3.57), and unfamiliar adults (M = 4.07). These findings suggest that children experienced greater communication difficulties outside familiar home environments.

Table 3 Pearson correlation between screen dependency and speech intelligibility scores among children with ASD.

Variables	r	*p* value
Total SDS score and total ICS score	0.34	0.067

Pearson correlation analysis evaluating the linear relationship between continuous total SDS scores and continuous total ICS scores. While a weak positive linear trend was observed (r = .34), this relationship did not reach statistical significance (p = .067). Therefore, the data from this sample does not support the hypothesis that increased screen dependency is linearly correlated with worse speech intelligibility in community contexts.

Figure 1 Percentage of children demonstrating each screen-use habit, behavioral dependency, and developmental characteristic (N = 30). The horizontal bars represent the proportion of the sample for whom caregivers reported the characteristic as present.



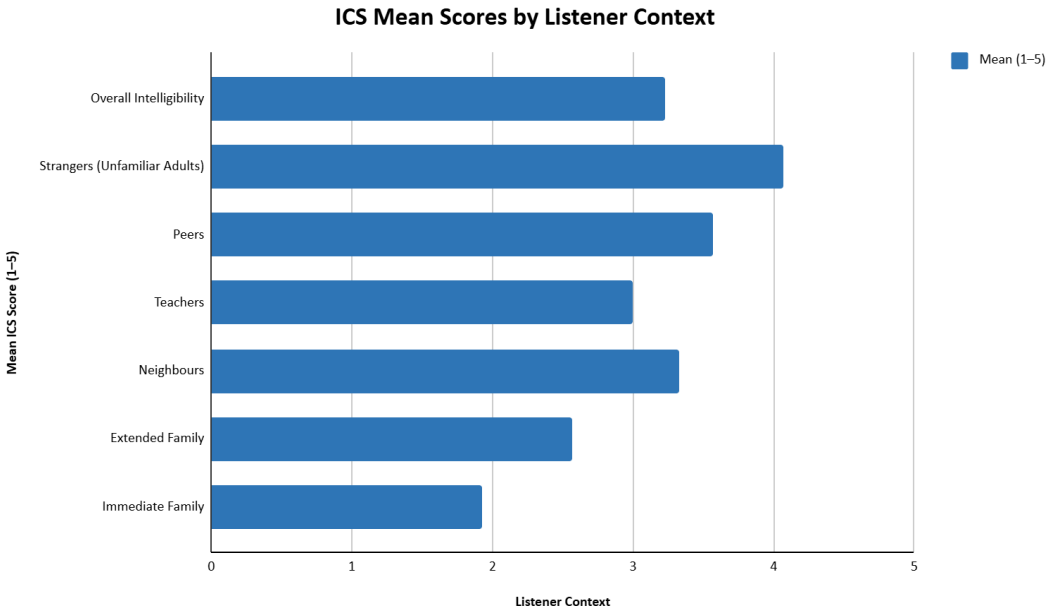


Figure 2 shows the mean score of questions evaluated on social intelligibility.

The present study examined screen dependency and related developmental characteristics among children with Autism Spectrum Disorder (ASD) aged 2–5 years in Delhi NCR. Data obtained from 30 parents were analyzed using descriptive statistics and Pearson's chi-square analysis.

Most children in the study were exposed to screens for more than two hours per day (86.7%). Screen use during meals was reported in 76.7% of the children, while 66.7% used screens at bedtime. Independent use of digital devices was observed in 73.3% of the participants. Behavioral dependence on screens was also commonly reported. A majority of parents stated that their children became upset or showed tantrum-like behavior when devices were removed (83.3%). In addition, 70.0% of the children preferred screen-based activities over toys and other play activities. About developmental indicators, 63.3% of the children showed poor response to name, 60.0% showed poor or avoidant eye contact, 53.3% demonstrated echolalia, and 56.7% showed stimming behaviors. However, these developmental indicators were not found to be statistically significant. A weak positive correlation was found between total SDS and total ICS scores (r = .34, p = .067)

The Intelligibility in Context Scale (ICS) findings showed reduced speech intelligibility in unfamiliar social situations. Immediate family members reported the highest level of understanding (M = 1.93, SD = 0.63), while poorer intelligibility was reported by peers (M = 3.57, SD = 0.84) and unfamiliar adults (M = 4.07, SD = 0.73). The overall intelligibility score indicated poor communication across community settings (M = 3.23, SD = 0.84). Pearson Chi-square analysis showed significant associations for high screen exposure, tantrum behavior, preference for screens over toys, and reduced outdoor play ($p < .05$). No significant association was observed for poor eye contact, echolalia, stimming, or poor response to name.

8. Discussion

The present study investigated screen dependency and its developmental correlates among young children with Autism Spectrum Disorder (ASD) in Delhi NCR. Consistent with growing clinical concerns regarding digital media, we observed exceptionally high levels of screen exposure within the sample, with the vast majority of children (86.7%) using devices for over two hours daily. However, the most critical takeaway from the data is the clear divergence between behavioral routine variables and core neurodevelopmental features.

Chi-square analyses revealed that heavy screen dependency was strictly associated with routine-based family disruptions rather than baseline autism features. High device reliance was significantly linked to severe tantrums upon device removal ($p = .001$), screen usage during functional family routines like meals ($p = .005$), and a clear reduction in physical activity via restricted outdoor play ($p = .043$). These behavioral patterns align with findings by Dong et al. (2021) and Mazurek and Wenstrup (2013), who similarly noted increased behavioral management difficulties and heavy screen preference among preschool children with ASD compared to their neurotypical peers.

In contrast to these behavioral challenges, core neurodevelopmental traits of ASD showed no statistical association with high screen usage patterns. Features such as avoidant eye contact ($p = .362$), stimming ($p = .585$), and echolalia ($p = .856$) remained completely independent of screen dependency scores. This distinction strongly suggests that while young children with ASD are highly vulnerable to developing rigid behavioral habits around visually stimulating digital media, this exposure does not actively alter or aggravate their underlying neurobiology. The dependency creates substantial behavior-management friction for caregivers during daily transitions, but it does not dictate biological symptom severity.

Regarding communication, the Intelligibility in Context Scale (ICS) findings indicated that children were best understood by immediate family members, with speech intelligibility dropping significantly in unfamiliar community settings. While we observed a weak linear trend between total screen dependency and functional speech clarity, a Pearson product-moment correlation confirmed this relationship failed to reach statistical significance ($r = .34$, $p = .067$). This reinforces that early childhood communication profiles in this population are shaped by baseline developmental trajectories and foundational language delays, rather than digital device exposure alone.

9. Summary

This study establishes a critical distinction between the behavioral consequences of screen dependency and the core neurodevelopmental features of Autism Spectrum Disorder (ASD) in early childhood. While heavy digital media use is highly prevalent among this demographic, the data indicate that its impacts are strictly localized to daily routine disruptions most notably severe tantrums during device removal, persistent usage during family meals, and a reduction in outdoor physical play. Crucially, screen dependency does not exacerbate baseline autistic traits such as echolalia, stimming, or avoidant eye contact, nor does it share a statistically significant correlation with overall speech intelligibility. Ultimately, these findings suggest that while excessive screen time creates substantial behavior-management friction for caregivers, it does not alter the underlying biological severity of the disorder.

Moving forward, pediatric clinical guidance should focus on equipping families with practical strategies to navigate digital transitions and encourage balanced, play-based routines, rather than framing screen exposure as a direct driver of core autism symptoms.

10. Limitations of The Study

Several methodological limitations must be considered when interpreting the findings of this study. First, the small sample size of 30 participants from a specific urban zone in Delhi NCR restricts the generalizability of the results to the broader population of young children with Autism Spectrum Disorder (ASD) in India. Second, the lack of a neurotypical control group makes it difficult to determine whether these high screen habits and behavioral struggles are unique to ASD or simply reflect widespread, modern pediatric trends in urban environments. Third, relying entirely on parent-report questionnaires introduces potential recall bias, which may be compounded by the omission of critical confounding variables such as parental socioeconomic status, baseline autism severity, or concurrent enrollment in speech-language and behavioral therapies. Finally, because this study utilized a descriptive cross-sectional design, it captures only a single moment in time and cannot establish causality; it remains unclear whether heavy screen dependency triggers routine-based behavioral distress or if caregivers are simply utilizing digital devices as a necessary soothing tool to manage pre-existing behavioral challenges.

11. Future Recommendations

Future studies may include a larger sample size and participants from different geographical regions to improve generalizability. Longitudinal studies may help in understanding the long-term effects of screen dependency on communication, behavior, and social development in children with ASD. Further research may also compare screen dependency patterns between children with ASD and typically developing children. Including direct behavioral observation and clinical assessment measures, along with parent reports, may provide more detailed and objective findings.

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