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Original Article

Impact Of Screen Time Exposure and Social Communication Deficits in Children With Autism Spectrum Disorder

Emaan Muhammad Javed[1], Aaron Anthony John[2], Fatima[3], Hawa Naqvi[4], Haifa Arain[5], Zara Ijaz[6]

[1] Paediatric trainee PG 1, Combined Military Hospital, Kharian, Pakistan
[2] Occupational Therapist, Dar Ul Sukun, Karachi, Pakistan
[3] SR Psychiatry, Jinnah Medical College & Jinnah Teaching Hospital, Peshawar, Pakistan
[4] Clinical Psychologist, Lahore Garrison University, Lahore, Pakistan
[5] Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan
[6] MBBS 3rd year student, Islamic International Medical College, Riphah International University, Pakistan

***Corresponding author: Emaan Muhammad Javed, emaanmuhammadjaved@gmail.com**

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ABSTRACT

Background: Screen exposure is increasingly common among children, including those with autism spectrum disorder, and may reduce opportunities for reciprocal caregiver-child interaction when used passively or without supervision. Children with autism spectrum disorder already experience difficulties in eye contact, response to name, gesture use, joint attention, peer interaction, and social reciprocity, making screen-use patterns clinically relevant. Objective: To determine the association between daily screen time exposure and severity of social communication deficits among children with autism spectrum disorder in Punjab, Pakistan. Methods: This cross-sectional observational study included 180 children aged 3–12 years with clinically diagnosed autism spectrum disorder from selected developmental clinics, therapy centers, and special education settings in Punjab. Parent-reported data were collected on demographic characteristics, daily screen duration, device type, age at first regular exposure, supervision, contextual screen use, and social communication deficits. Screen time was categorized as <1 hour, 1–2 hours, 2–4 hours, and >4 hours per day. Descriptive statistics, group comparisons, and correlation analysis were used. Results: The mean age was 6.8 ± 2.4 years, and 131 children (72.8%) were male. Mobile phones were the most commonly used device, reported in 104 children (57.8%). Mean social communication deficit scores increased across screen-time categories from 24.6 ± 7.8 in children with <1 hour/day exposure to 48.9 ± 10.4 in those with >4 hours/day exposure. The association was statistically significant ($p < 0.001$), and daily screen hours showed a moderate positive correlation with social communication deficit score ($r = 0.58$, $p < 0.001$). Conclusion: Higher parent-reported screen time was significantly associated with greater parent-reported social communication deficits among children with autism spectrum disorder. Screen-use assessment and practical counselling to reduce prolonged passive and unsupervised exposure should be incorporated into autism spectrum disorder management. Keywords: Autism spectrum disorder, screen time, social communication, mobile phone use, children, Punjab, Pakistan.

INTRODUCTION

Autism spectrum disorder is a neurodevelopmental condition characterized by persistent difficulties in social communication and social interaction, together with restricted, repetitive patterns of behavior, interests, or activities. In childhood, social communication difficulties commonly include reduced eye contact, limited response to name, poor joint attention, delayed or atypical use of gestures, limited reciprocal interaction, and reduced interest in peer engagement. These impairments vary in severity

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across children and may influence language development, adaptive behavior, school participation, family routines, and long-term functional independence. Because social communication skills develop through repeated reciprocal interaction with caregivers, siblings, teachers, therapists, and peers, environmental factors that reduce opportunities for face-to-face engagement may be clinically relevant in children with autism spectrum disorder.

Screen exposure has become a routine part of early childhood in many households, including television, mobile phones, tablets, computers, online videos, games, and educational applications. In Pakistan, mobile phones are widely available in both urban and semi-urban families and are often used to keep children occupied, calm, or engaged during meals, travel, household work, or social gatherings. Although digital media may provide structured learning opportunities when used briefly and interactively under adult guidance, prolonged passive or unsupervised screen exposure may reduce opportunities for contingent caregiver-child communication, social reinforcement, shared attention, pretend play, outdoor activity, and peer interaction. These concerns are particularly important in children with autism spectrum disorder because they already require intensive, repeated, and socially responsive interaction to support communication and adaptive development.

Existing evidence suggests a clinically important but complex relationship between screen exposure and autism-related outcomes. A recent systematic review and meta-analysis reported an association between screen time and autism spectrum disorder-related outcomes in observational studies, while emphasizing that available evidence remains insufficient to establish causality because most studies are cross-sectional and vulnerable to confounding and reverse causation (1). A broader systematic review further indicated that children with autism spectrum disorder may have higher screen exposure and greater vulnerability to problematic digital media use than typically developing children (2). Early screen exposure has also been linked with later autism spectrum disorder diagnosis or autism-like symptoms in large observational cohorts and systematic reviews, although these associations must be interpreted cautiously because children with emerging developmental differences may also be more likely to engage with screens or receive screens as a behavioral management strategy (3,4).

The possible direction of association is therefore bidirectional. On one side, prolonged passive screen exposure may reduce the time available for reciprocal communication, eye contact, joint attention, shared play, and parent-child interaction. On the other side, children with autism spectrum disorder may prefer screens because digital content is predictable, repetitive, visually stimulating, less socially demanding, and easier to control than human interaction. Studies examining early-life digital media exposure, reduced social experiences, and autism-like symptoms support this concern, while research on bidirectional influences between screen exposure and social behavioral traits suggests that both child characteristics and media habits may shape each other over time (5,6). This bidirectionality makes it essential for observational studies to avoid causal claims and instead describe the strength and pattern of association between screen habits and clinically relevant communication outcomes.

Several studies among children with autism spectrum disorder have reported that longer screen time is associated with greater symptom severity, poorer developmental quotients, and weaker developmental or behavioral outcomes. Research among toddlers with autism spectrum disorder has shown an association between screen time and symptom severity, while other studies have reported correlations between screen exposure, autistic symptoms, and developmental quotients in children with autism spectrum disorder (7,8). Device type may also be relevant. Mobile phones and tablets provide highly individualized, repetitive, and easily accessible stimulation, which may reinforce solitary viewing patterns and reduce social engagement more than shared television viewing. Previous research has shown high use of television, video games, and digital media among children with autism spectrum disorder, reinforcing the need to examine not only total screen duration but also device type, content, timing, and level of adult supervision (9).

Screen exposure may also influence communication indirectly through language, sleep, behavior, and emotional regulation. Systematic evidence has linked higher screen use with weaker child language skills, while other reviews have described potential developmental and behavioral concerns related to screen media exposure in children, including those with autism spectrum disorder (10). For children with autism spectrum disorder, poor sleep, irritability, reduced attention, and behavioral dysregulation may further compromise therapy participation, classroom adjustment, and daily communication practice. However, digital media should not be considered uniformly harmful. Structured, developmentally appropriate, time-limited, and adult-mediated screen use may support selected learning goals, particularly when integrated with caregiver interaction and therapeutic objectives. The main concern is prolonged, passive, solitary, and poorly supervised screen exposure that replaces human communication rather than supporting it (11).

Local evidence from Pakistan remains limited, particularly among clinically diagnosed children with autism spectrum disorder. A study from Islamabad reported that preschool children with more than 60 minutes of screen time had more behavioral problems, sleep problems, withdrawal, and autism-spectrum-related problems than children with lower screen exposure (12). Pakistani families of children with autism spectrum disorder may also experience caregiver stress, anxiety, and burnout, which can influence daily routines, supervision patterns, and reliance on screens at home (13). However, there is still insufficient local evidence from Punjab regarding screen duration, device type, parental supervision, age at first regular exposure, and their association with social communication deficits among children already diagnosed with autism spectrum disorder.

The present cross-sectional study was therefore designed using a PICO-oriented framework in which the population comprised children aged 3 to 12 years with clinically diagnosed autism spectrum disorder in Punjab, Pakistan; the exposure was higher daily screen time, including mobile phone, television, tablet, computer, video games, and online video use; the comparison was lower daily screen time exposure; and the outcome was severity of parent-reported social communication deficits across domains including eye contact, response to name, joint attention, gesture use, peer interaction, and social reciprocity. This study aimed to determine the association between daily screen time exposure and severity of social communication deficits in children with autism spectrum disorder and to describe clinically relevant screen-use patterns, including commonly used device, age at first regular exposure, supervision, and contextual use during meals or before sleep.

MATERIAL AND METHODS

This study was conducted as a cross-sectional observational study among children with clinically diagnosed autism spectrum disorder in Punjab, Pakistan. A cross-sectional design was selected because the objective was to examine the association between current screen-time exposure and severity of social communication deficits at a single point in time rather than to establish temporal sequence or causality. The study was carried out in selected developmental clinics, speech therapy centers, occupational therapy centers, autism therapy centers, and special education settings where children with autism spectrum disorder commonly receive diagnostic assessment, rehabilitation, behavioral support, speech therapy, occupational therapy, or educational services. Data collection was completed over a six-month period during routine visits so that participation did not interfere with ongoing clinical care, therapy sessions, or school-based support.

The study population comprised children aged 3 to 12 years with a previous clinical diagnosis of autism spectrum disorder. Diagnosis was accepted when documented or reported as having been made by a pediatrician, child psychiatrist, developmental pediatrician, psychologist, or trained developmental specialist. This age range was selected because social communication difficulties are usually observable during early and middle childhood and because screen-use habits are commonly established during these years. Children were eligible if they were aged 3 to 12 years, had a confirmed diagnosis of autism

spectrum disorder, were living in Punjab, Pakistan, and had a parent or primary caregiver who could provide reliable information regarding screen exposure and social behavior. Children were excluded if they had severe hearing loss, severe visual impairment, uncontrolled epilepsy, serious neurological illness independently affecting communication, acute illness at the time of data collection, or caregiver inability to provide reliable responses.

Participants were recruited through non-probability consecutive sampling. All eligible children visiting the selected centers during the study period were screened for inclusion, and parents or primary caregivers were invited to participate after receiving an explanation of the study purpose, procedures, expected time commitment, voluntary nature of participation, and confidentiality safeguards. Written informed consent was obtained from the parent or primary caregiver before data collection. Because the study involved children with neurodevelopmental difficulties, information was collected from parents or primary caregivers rather than directly from the child. Data collection was performed through face-to-face interviews using a structured questionnaire to improve completeness of responses and reduce misunderstanding of items.

The questionnaire collected demographic, clinical, screen-related, and social communication data. Demographic variables included child age, gender, residence, parental education, parental occupation, family type, and socioeconomic background. Clinical variables included age at first noticed autism-related symptoms, age at diagnosis, speech delay, therapy history, school status, and associated behavioral concerns. Screen exposure was assessed by asking parents or primary caregivers to report the child's average daily screen time during the preceding one month. Screen time was operationally defined as the total daily time spent using or watching television, mobile phone, tablet, computer, video games, online videos, cartoons, songs, games, or other digital content. Screen exposure was categorized as less than 1 hour per day, 1 to 2 hours per day, 2 to 4 hours per day, and more than 4 hours per day. Additional screen-related variables included most commonly used device, type of content viewed, age at first regular screen exposure, whether screen use occurred alone or with adult supervision, and whether screens were used during meals or before sleep.

The primary exposure variable was average daily screen time, measured in hours per day and analyzed both as a categorical exposure group and, where appropriate, as a continuous screen-duration variable. Secondary exposure variables included device type, age at first regular screen exposure, parental supervision, screen use during meals, and screen use before sleep. The primary outcome variable was severity of social communication deficit, assessed using a structured parent-reported assessment form covering core social communication domains relevant to autism spectrum disorder. These domains included eye contact, response to name, joint attention, use of gestures, sharing of interest, initiation of interaction, verbal communication, non-verbal communication, peer interaction, and social reciprocity. Each item was scored according to severity of difficulty, with higher total scores indicating greater social communication impairment. Parents were instructed to report the child's usual behavior rather than behavior observed only on the day of interview.

To improve data quality, the interviewer explained questionnaire items in simple language when needed, checked forms for completeness at the time of data collection, and reviewed responses for internal consistency before data entry. A defined one-month recall period was used for screen-time exposure to reduce variability in parental reporting. Children with conditions likely to independently affect communication, such as severe hearing impairment, severe visual impairment, uncontrolled epilepsy, or serious neurological illness, were excluded to reduce clinical confounding. Key demographic and clinical variables were collected because age, gender, parental education, therapy exposure, school attendance, family background, and associated behavioral concerns may influence both screen habits and communication outcomes.

RESULTS

A total of 180 children with autism spectrum disorder were included. The sample was planned to provide adequate precision for evaluating the expected relationship between screen-time exposure and social communication deficit scores while allowing comparison across screen-time categories. Consecutive recruitment was used because autism spectrum disorder cases are more reliably accessible through developmental, therapy, and special education settings than through general community sampling. The final sample included children across different age groups, both genders, and varied residential and family backgrounds to improve the clinical relevance of the findings within the Punjab context.

Completed questionnaires were reviewed before data entry, and incomplete or unreliable responses were excluded from analysis. Descriptive statistics were used to summarize demographic, clinical, and screen-related characteristics. Categorical variables were reported as frequencies and percentages, while continuous variables were reported as mean and standard deviation when approximately normally distributed. Screen-time categories were compared according to social communication deficit scores. Chi-square testing was planned for associations between categorical variables, while independent-sample t-test or one-way analysis of variance was used for comparison of mean social communication scores where appropriate. When more than two screen-time groups were compared, analysis of variance was considered the primary group comparison method. Correlation analysis was used to assess the relationship between average daily screen time and social communication deficit score. Statistical significance was assessed using a two-sided p-value threshold of less than 0.05.

The analysis was designed to remain consistent with the cross-sectional nature of the study. Therefore, findings were interpreted as associations rather than causal effects. Potential confounding was considered during interpretation by reviewing demographic, clinical, therapy-related, school-related, and screen-supervision variables. Where data were sufficient, subgroup or comparative analyses were planned for screen supervision, device type, and contextual screen use during meals or before sleep. All data were handled confidentially, participant identifiers were not used in the analysis dataset, and study information was used only for research purposes. The study followed ethical principles for research involving children, including voluntary participation, caregiver consent, privacy during data collection, and protection of participant confidentiality.

A total of 180 children with clinically diagnosed autism spectrum disorder were included in the study. The age of participants ranged from 3 to 12 years, with a mean age of 6.8 ± 2.4 years. Most participants were male, and most were from urban areas of Punjab. Daily screen exposure varied across the sample, with the largest proportion of children using screens for 2–4 hours per day. Mobile phone was the most frequently reported screen device.

Table 1. Demographic and Screen-Related Characteristics of Children With Autism Spectrum Disorder (N = 180)

Variable	Category	n	%
Age group	3–5 years	62	34.4
	6–8 years	71	39.4
	9–12 years	47	26.1
Gender	Male	131	72.8
	Female	49	27.2
Residence	Urban	116	64.4
	Rural	64	35.6
Daily screen time	<1 hour/day	28	15.6
	1–2 hours/day	51	28.3
	2–4 hours/day	63	35.0
	>4 hours/day	38	21.1
Most used screen device	Mobile phone	104	57.8
	Television	42	23.3
	Tablet	24	13.3
	Computer/video game	10	5.6

The study sample was predominantly male, with 131 boys representing 72.8% of the participants. The largest age category was 6–8 years, comprising 71 children, followed by 3–5 years and 9–12 years. Screen exposure of 2–4 hours per day was the most common category, reported in 63 children, while 38 children had more than 4 hours of daily screen exposure. Mobile phones were the most frequently used screen device, reported in 104 children, indicating that handheld digital exposure was the dominant screen modality in this sample.

The mean social communication deficit score increased across daily screen-time categories. Children with less than 1 hour of daily screen exposure had the lowest mean score, while children with more than 4 hours of daily screen exposure had the highest mean score. The difference across screen-time categories was statistically significant on one-way analysis of variance.

Table 2. Social Communication Deficit Scores Across Daily Screen-Time Categories

Daily Screen Time	n	Mean ± SD	95% CI
<1 hour/day	28	24.6 ± 7.8	21.7–27.5
1–2 hours/day	51	31.8 ± 8.6	29.4–34.2
2–4 hours/day	63	39.7 ± 9.1	37.5–41.9
>4 hours/day	38	48.9 ± 10.4	45.6–52.2

The mean social communication deficit score rose from 24.6 in the <1 hour/day group to 48.9 in the >4 hours/day group. The 95% confidence intervals showed a progressive upward shift across exposure categories, with limited overlap between the lowest and highest screen-time groups. This pattern indicates a graded association between higher daily screen exposure and greater parent-reported social communication deficit scores.

Table 3. One-Way Analysis of Variance for Social Communication Deficit Score by Screen-Time Category

Source	SS	df	MS	F	p-value	η^2
Between groups	11526.8	3	3842.3	46.70	<0.001	0.443
Within groups	14476.8	176	82.3			
Total	26003.6	179				

ANOVA demonstrated a statistically significant difference in mean social communication deficit score across the four screen-time categories, $F(3,176) = 46.70$, $p < 0.001$. The derived η^2 value of 0.443 indicates that screen-time category accounted for approximately 44.3% of the observed variance in social communication deficit scores in this aggregate analysis. This estimate should be interpreted cautiously because it is based on grouped summary data rather than an adjusted individual-level model.

Compared with the <1 hour/day reference group, all higher screen-time categories showed progressively larger mean differences in social communication deficit scores. Standardized mean differences also increased across exposure categories.

Table 4. Mean Difference and Standardized Mean Difference Compared With <1 Hour/Day Screen Exposure

Daily Screen Time	Mean Difference	95% CI	Cohen's d	95% CI
1–2 hours/day	7.2	3.4–11.0	0.86	0.38–1.35
2–4 hours/day	15.1	11.4–18.8	1.73	1.22–2.24
>4 hours/day	24.3	19.8–28.8	2.59	1.92–3.25

The difference in mean social communication deficit score compared with the <1 hour/day group increased from 7.2 points in the 1–2 hours/day group to 24.3 points in the >4 hours/day group. Cohen's d also increased progressively, from 0.86 for 1–2 hours/day to 2.59 for >4 hours/day. These estimates show a strong graded difference in parent-reported communication deficit burden across increasing screen-time categories, although the cross-sectional design does not establish causality.

A correlation analysis was reported between average daily screen hours and social communication deficit score. The correlation was positive and statistically significant.

Table 5. Correlation Between Daily Screen Hours and Social Communication Deficit Score

Variables	N	r	95% CI	p-value
Daily screen hours and social communication deficit score	180	0.58	0.47–0.67	<0.001

Daily screen hours showed a moderate positive correlation with social communication deficit score, r = 0.58, p < 0.001. The 95% confidence interval ranged from 0.47 to 0.67, supporting a consistent positive association between longer daily screen exposure and greater parent-reported social communication difficulty.

Parents also reported that children with longer screen exposure more often used screens without adult supervision, preferred screen-based activity over social play, and showed irritability when screens were removed. Screen use during meals and before sleep was also described more frequently among children with higher communication difficulty scores. However, numerical subgroup data for supervision status, mealtime use, bedtime use, content type, age at first exposure, and device-specific communication scores were not available in the supplied manuscript. These variables should be analyzed in future revisions using frequency distributions, group-wise means, confidence intervals, and appropriate comparative tests.

Overall, the results showed a statistically significant and clinically meaningful association between higher daily screen exposure and greater social communication deficit scores among children with autism spectrum disorder. The findings remained consistent across categorical group comparisons, standardized differences, and correlation analysis. Because the study was cross-sectional and based on parent-reported exposure and outcome data, these results should be interpreted as evidence of association rather than evidence that screen exposure causes worsening of social communication deficits.

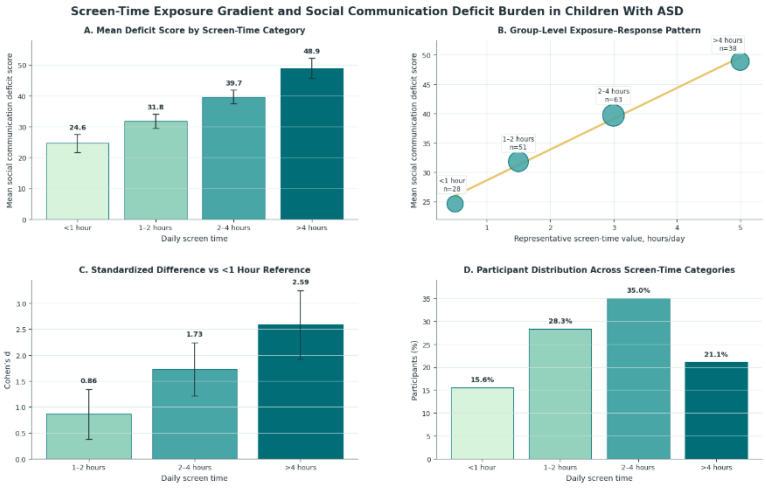

Figure 1 The panelled figure demonstrates a clear exposure-gradient pattern between screen-time category and parent-reported social communication deficit score in children with ASD. Mean deficit scores increased from 24.6 ± 7.8 in children with <1 hour/day screen exposure to 31.8 ± 8.6 with 1–2 hours/day, 39.7 ± 9.1 with 2–4 hours/day, and 48.9 ± 10.4 with >4 hours/day. The largest participant proportion was in the 2–4 hours/day category (35.0%), followed by 1–2 hours/day (28.3%) and >4 hours/day (21.1%). Compared with the <1 hour reference group, standardized mean differences increased progressively across exposure groups, indicating a strong graded difference in communication deficit burden across higher screen-time categories. Since the data are cross-sectional and aggregated, the figure should be interpreted as an association pattern rather than evidence of causality.

DISCUSSION

The present study found that higher parent-reported daily screen time was associated with greater parent-reported social communication deficits among children with autism spectrum disorder in Punjab, Pakistan. The mean social communication deficit score increased progressively across screen-time categories, from 24.6 ± 7.8 among children with less than one hour of daily screen exposure to 48.9 ± 10.4 among children with more than four hours of daily exposure. The moderate positive correlation between daily screen hours and social communication deficit score further supports an exposure-

gradient pattern, although the cross-sectional design does not allow inference about directionality or causation. These findings are consistent with systematic evidence showing an association between screen time and autism-related outcomes, while also reinforcing the need to interpret observational associations cautiously because children with greater developmental or behavioral difficulties may themselves be more likely to prefer screen-based activity (1,2).

The observed gradient in social communication deficit scores is clinically relevant because the affected domains—eye contact, response to name, gesture use, joint attention, peer interaction, and social reciprocity—represent core areas of functional difficulty in autism spectrum disorder. Social communication develops through repeated reciprocal experiences, including caregiver-child interaction, shared attention, imitation, turn-taking, play, and emotionally responsive communication. Prolonged passive screen exposure may reduce the daily frequency of these interactions, particularly when the child watches alone or when screens are used as a substitute for direct engagement. This interpretation is supported by prior evidence linking early screen exposure with later autism-related or autism-like symptoms and by research suggesting that digital media exposure and reduced early social experiences may be associated with social-communication differences (3–6).

The findings also align with studies conducted specifically among children with autism spectrum disorder. Previous research has reported associations between screen time and autism symptom severity among toddlers, as well as correlations between screen exposure, autistic symptoms, and developmental quotients in children with autism spectrum disorder (7,8). The present study extends this evidence by focusing on a local clinical sample from Punjab and by examining social communication deficits as the main outcome rather than broader developmental or behavioral indicators. The consistency of the increasing deficit score across screen-time groups suggests that screen habits should be included in clinical history-taking and parent counselling for children with autism spectrum disorder, particularly when daily exposure exceeds two hours or when screen use is passive and unsupervised.

Mobile phone use was the most commonly reported screen modality in this study, which is important in the Pakistani context because mobile phones are widely available, portable, individually controlled, and often used to regulate child behavior during meals, travel, household work, or family gatherings. Compared with shared television viewing, mobile phones may increase solitary engagement because the child can repeatedly access preferred videos, songs, cartoons, or games without social negotiation. Previous studies have reported high levels of television, video game, and digital media use among children with autism spectrum disorder, and device-specific studies have shown that screen exposure is common in preschool children with autism spectrum disorder (9,14,15). This pattern may reflect both environmental availability and child-level preference for predictable, repetitive, visually stimulating, and less socially demanding activities.

The possibility of reverse causality must be considered carefully. Children with more severe autism-related symptoms, poorer communication, stronger repetitive interests, sensory-seeking behavior, or greater irritability may be more likely to receive screens from caregivers as a practical management strategy. In this sense, screen use may not only be an exposure but also a response to pre-existing developmental and behavioral difficulties. Studies from different populations have shown associations between screen exposure and autism-like symptoms, but these findings do not necessarily prove that screen exposure causes autism spectrum disorder or directly worsens core symptoms (16–19). The present study therefore supports a clinically meaningful association rather than a causal relationship, and future longitudinal research is required to determine whether reducing passive screen exposure improves social communication outcomes over time.

The finding that children with longer screen exposure reportedly had greater difficulty in eye contact, response to name, gestures, peer interaction, and social reciprocity is consistent with the theoretical concern that passive digital media may compete with developmentally necessary social experiences. Studies among preschool children and children at increased likelihood for neurodevelopmental

conditions have similarly raised concerns regarding screen media exposure and developmental or behavioral outcomes (20,21). Broader evidence also links excessive screen exposure with developmental and behavioral problems, language difficulties, and sleep-related concerns, all of which may indirectly affect communication, learning readiness, therapy participation, and family routines (10,22). For children with autism spectrum disorder, these indirect pathways may be especially important because communication progress often depends on consistency, caregiver participation, sleep quality, structured routines, and repeated opportunities for guided social practice.

At the same time, screen use should not be interpreted as uniformly harmful. Digital media may have educational and therapeutic value when it is structured, time-limited, age-appropriate, goal-oriented, and used with adult mediation. Reviews on digital media and autism spectrum disorder emphasize both potential risks and opportunities, particularly when technology is integrated into intervention rather than used as passive entertainment (11,23,24). In practical terms, the key distinction is not simply whether the child uses screens, but how screens are used, for how long, at what developmental stage, with what content, and with what level of caregiver involvement. Co-viewing, interactive teaching, limited duration, predictable routines, and replacement of passive viewing with play-based social engagement may be more appropriate clinical targets than complete prohibition of all digital media.

The local relevance of these findings is substantial. In Pakistan, parents of children with autism spectrum disorder may face limited access to therapy services, high treatment costs, long travel distances, social stigma, school placement difficulties, and caregiver stress. These contextual pressures may increase reliance on mobile phones or television as accessible tools for calming, occupying, or managing children during daily routines. Prior Pakistani evidence has reported associations between higher screen time and behavioral, sleep, withdrawal, and autism-spectrum-related concerns among preschool children, while local research has also described parental anxiety and burnout in families of children with autism spectrum disorder (12,13). These realities suggest that screen-time counselling should be practical, non-blaming, and family-centered rather than punitive. Parents may benefit more from structured replacement strategies, caregiver coaching, and realistic routines than from general advice to “reduce screen time.”

This study has several limitations. First, the cross-sectional design prevents conclusions about temporality or causality. Second, both screen exposure and social communication deficits were parent-reported, which may introduce recall bias, reporting bias, and common-method bias. Third, the study used non-probability consecutive sampling from clinical, therapy, and special education settings, so the findings may not fully represent all children with autism spectrum disorder in the community. Fourth, the social communication assessment was based on a structured parent-reported form, and future reporting should clearly describe its scoring range, validation process, reliability, and interpretation thresholds. Fifth, the study did not fully adjust for potential confounders such as baseline autism severity, intellectual functioning, language level, therapy intensity, parental education, socioeconomic status, sleep quality, and behavioral comorbidities. Finally, screen exposure was assessed using caregiver recall rather than objective device-use tracking, which may affect precision.

Despite these limitations, the study provides useful local evidence that higher screen exposure is associated with greater social communication difficulty among children with autism spectrum disorder in Punjab. The findings support the need for routine assessment of screen habits during autism spectrum disorder evaluation and rehabilitation planning. Clinicians, speech therapists, occupational therapists, psychologists, pediatricians, and special educators should ask about daily screen duration, device type, age at first regular exposure, supervision, content, and screen use during meals or before sleep. Future studies should use longitudinal designs, validated social communication scales, objective screen-time measures, and adjusted statistical models to clarify the direction and strength of this association and to evaluate whether structured screen-reduction and caregiver-mediated interaction programs can improve communication outcomes.

CONCLUSION

This study concluded that higher parent-reported screen time was significantly associated with greater parent-reported social communication deficits among children with autism spectrum disorder in Punjab, Pakistan. Children with longer daily screen exposure showed higher deficit scores across clinically relevant domains, including eye contact, response to name, gesture use, peer interaction, joint attention, and social reciprocity. Mobile phones were the most commonly used device, and prolonged or unsupervised screen use appeared to be an important routine concern for families. Because the study was cross-sectional, the findings should be interpreted as an association rather than evidence that screen time causes worsening of social communication. Nevertheless, the results support routine screen-use assessment in autism spectrum disorder management and highlight the need for practical, family-centered counselling that reduces passive and unsupervised screen exposure while increasing direct caregiver-child interaction, structured play, speech practice, outdoor activity, and socially responsive communication.

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