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(RESEARCH ARTICLE)

PATTERNS OF EARLY SCREEN EXPOSURE DURING 8-18 MONTHS OF AGE AMONG CHILDREN WITH SPEECH DELAY: A RETROSPECTIVE OBSERVATIONAL STUDY

Md. Mahmudul Hasan [1,*] and Prosenjeet Acharjee [2]

[1] Nutritionist, IPNA, Bangladesh Medical University, Dhaka, Bangladesh.
[2] Child Development Therapist, IPNA, Bangladesh Medical University, Dhaka, Bangladesh.
* Corresponding Author

ORCID Details
Mahmudul Hasan: https://orcid.org/0009-0008-1600-5355

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ABSTRACT

Background: Screen-based devices have become increasingly integrated into the daily lives of young children. The timing, duration, content, and circumstances of early screen exposure are important aspects of children's media environments.

Objective: To characterize the pattern of early screen use (8-18months) in children with speech delay attending a tertiary neurodevelopmental centre in Bangladesh.

Methods: A retrospective observational study was conducted at the Institute of Paediatric Neurodisorder and Autism (IPNA), Bangladesh Medical University, Dhaka (July to November 2026). Parents/Guardians of 100 children aged between 1-6 years with speech delay completed a structured questionnaire regarding their child's screen use between 8-18months. Data was analyzed using descriptive statistics and processed using SPSS v26.

Results: All children had a history of screen use. 20% had early screen use <8 months, 42% had screen use between 8-13months and 38% had screen use between 14-18months. The most common screen used was mobile phone (76%). On average children had screen use for 194.10 minutes per day (SD=96.05). The median was 180minutes (IQR: 120-240). 36% of children had >180 minutes of screen time per day. 53% had screen time throughout the day and 30% had screen time whilst eating. The majority of screen content was cartoons (88%). 59% had both Bangla and foreign language content. 87% had mothers as their main caregiver. Although 94% of guardians said their child had spoken 1-2 words between 8-18 months, 74% felt screen use may have contributed to their child's speech delay.

Conclusion: Children with speech delay attending a tertiary centre in Bangladesh had high levels of early screen use. This highlights the importance of educating parents/caregivers about appropriate screen use for their child's age and interactive parenting. Due to all participants having speech delay, no causation could be inferred. Future comparative prospective studies would be beneficial.

Keywords: Early Screen Exposure, Screen Time, Speech Delay, Mobile and Television, Early Childhood

1 INTRODUCTION

Early life is an important period to develop communication, language, cognition and social skills. During the first 2 years of life children will develop communication skills through interaction with their cares and environment. Responsive parenting, verbal interaction, joint attention and play will all aid early communication and language development (Munzer et al., 2026).

With increased availability of smartphones, television and other technology, young children will be exposed to screen based media. This can be used as a source of entertainment, distraction, food accompaniment and to keep children occupied. Whilst there can be access to educational media, consideration must be given to amount of screen time, content and social interaction.

Research has been carried out into how screen time can impact children's language development. It was discovered in a systematic review and meta-analysis of 42 studies involving 18,905 children that high amounts of screen time led to poorer language skills (Madigan et al., 2020). Educational content and co-viewing with parents was found to be associated with improved language outcomes. Therefore, it is important to consider the amount and quality of screen time children are receiving.

International guidelines recommend that young children should be following age appropriate media guidelines. Infants under 1 year should not have any sedentary screen time (WHO, 2019). Children aged 1 year should not have sedentary screen time and children aged 2 years should not have more than 1 hour of sedentary screen time, ideally less. The AAP also recommend that families should consider children's developmental requirements, family context, content quality and opportunities for healthy activities (Munzer et al., 2026).

In Bangladesh there is increased availability of smartphones and television. Parents/other cares may use these in the home whilst eating, doing household tasks and keeping children occupied. However there is little information within the local clinical setting about how much screen time children had in their first 18 months of life who were identified with speech delay.

An insight into early screen time exposure patterns could provide useful information to understand their early media environment. This could highlight common practices within the home and educate cares about using age appropriate screen time.

As all children within this group have speech delay we cannot determine if there is an increased risk of speech delay due to screen time. Therefore this study will look at describing patterns of screen time.

This study aimed to describe screen time patterns and characteristics during early life (8-18 months) in children identified with speech delay attending IPNA, BMU, and Dhaka, Bangladesh.

Objectives

1.1 General objective

To describe the patterns and characteristics of early screen exposure during 8-18 months of age among children identified with speech delay.

1.2 Specific objectives

- To describe the socio-demographic characteristics of children with speech delay and their families.
- To determine the types of screen devices used during the 8-18-month ago period.
- To describe the age at first screen exposure and daily screen exposure duration.
- To identify common screen-viewing circumstances, content types, and content languages.
- To describe caregiver-reported early word production and guardians' perceptions regarding possible reasons for speech delay.

2 MATERIAL AND METHODS

2.1 Study design

A retrospective observational study was conducted to describe early screen exposure patterns among children identified with speech delay. Information about screen exposure during the 8–18-month age period was obtained retrospectively from parents or guardians. The manuscript was prepared with reference to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations (von Elm et al., 2007).

2.2 Study setting and period

The study was conducted at the Outpatient Department of the Institute of Paediatric Neurodisorder and Autism (IPNA), Bangladesh Medical University (BMU), Dhaka, Bangladesh. The study period was July 2026 to November 2026.

2.3 Study population

The study population consisted of children aged 1-6 years attending the IPNA outpatient department who had been identified with speech delay. A total of 100 children with speech delay and a history of screen exposure were included in the study.

2.4 Criteria

2.4.1 Inclusion criteria

- Children aged 1-6 years at the time of assessment.
- Children identified with speech delay according to the clinical assessment or diagnostic criteria used at IPNA.
- Children with a reported history of screen exposure.
- Children whose parents or guardians could provide retrospective information about screen exposure during the 8-18-month ago period.
- Parents or guardians who provided informed consent.

2.4.2 Exclusion criteria

- Children whose parents or guardians were unable to provide adequate information about early screen exposure.
- Children with substantially incomplete information on the principal study variables.
- Children whose guardians declined participation.

2.5 Sample size calculation

The sample size was estimated using the single-population proportion formula described by Charan and Biswas (2013):

$$n = (Z^2 \times p \times q) / d^2$$

Where n = required sample size; Z = standard normal deviate at the 95% confidence level (1.96); p = assumed proportion of speech delay among young children attending a developmental clinic, conservatively estimated at 6% based on widely cited community prevalence figures for early childhood speech/language delay (i.e., q = 1 − p = 0.94); and d = desired precision (5%).

Substituting the values:

- $n = (1.96^2 \times 0.06 \times 0.94) / (0.05^2) = 86.7 \approx 87$
- After allowing for a 10% non-response rate:
- n (adjusted) = 87 / 0.90 = 96.7

The target sample size was therefore rounded to 100 participants. Because all enrolled children had speech delay and a history of screen exposure, the resulting sample describes the early media environment of a clinical group rather than the prevalence of speech delay in the general population.

2.6 Sampling technique

Participants were selected using convenience sampling from eligible children attending the IPNA outpatient department during the study period. The first 100 consecutive eligible children whose parents or guardians provided informed consent were enrolled.

2.7 Data collection procedure

Data were collected from parents or guardians using a structured questionnaire. The questionnaire covered socio-demographic characteristics, early screen exposure history, caregiving arrangements, screen-viewing circumstances, and retrospective communication history.

The screen exposure questions focused on the period between 8 and 18 months of age. The age at first screen exposure was recorded separately because some children had reportedly been introduced to screens before 8 months. The collected information included age at first screen exposure, type of screen device, daily screen exposure duration, common viewing circumstances, screen content, content language, main caregiver, early word production, and guardians' perceptions of possible reasons for speech delay.

2.8 Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the sociodemographic characteristics, screen exposure patterns, caregiving arrangements, and retrospective communication history of the participants. Categorical variables were presented as frequencies and percentages. The continuous variable "daily screen exposure in minutes" was summarized using mean, standard deviation (SD), median, and interquartile range (IQR). No comparison of speech delay status was performed because all participants had been identified with speech delay. No association analysis or binary logistic regression was conducted to estimate factors associated with the occurrence of speech delay.

3 RESULTS

3.1 Socio-demographic characteristics

Table 1 and figure 1 presents the socio-demographic characteristics of the 100 children with speech delay and their families. Most children were aged 3-4 years at the time of assessment (61%), followed by those aged 1–2 years (25%) and 5-6 years (14). Boys constituted 80% of the study population, while girls accounted for 20%.

Regarding family characteristics during the children's 8-18-month ago period, 60% belonged to families with 3–4 members and 29% had 5–6 family members, while 11% lived in households with more than six members. Nuclear families accounted for 64% of the sample and joint families for 36%. More than half of the mothers (52%) were aged 26-35 years, while 39% were aged 15-25 years. Similarly, 52% of fathers were aged 26-35 years and 45% were aged 36 years or older.

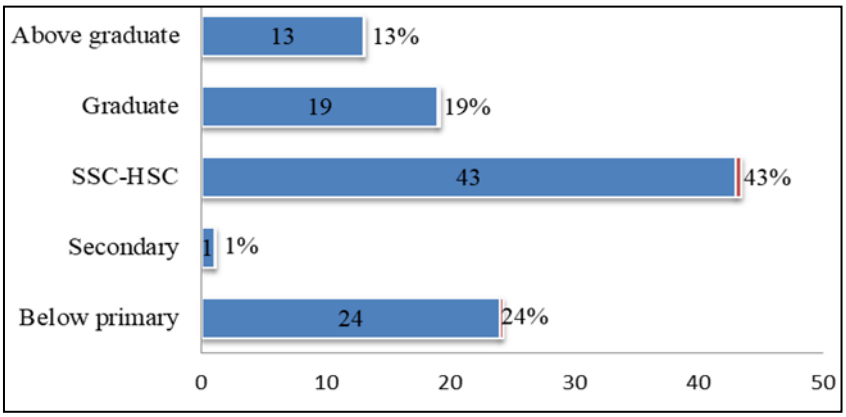

Figure 1: Maternal educational level (N = 100)

Regarding parental education, SSC-HSC was the most common educational level among both mothers (43%) and fathers (41%). Most mothers were homemakers (92%), whereas 8% were employed. Among fathers, 48% were service holders, 29% were involved in business, and 23% were working abroad. Most families (91%) reported a monthly household income above BDT 21,500.

Table 1: Socio-demographic Characteristics of the Study Participants (N = 100)

Characteristics	n	%	Characteristics	n	%
Current age of child (years)			Paternal educational level		
1-2	25	25	No formal education	6	6
3-4	61	61	Below primary	18	18
5-6	14	14	Secondary	2	2
Sex of child			SSC–HSC	41	41
			Graduate	15	15
Male	80	80	Above graduate	18	18
Female	20	20	*Maternal occupation*		
Family size during 8-18 months					
3-4 members	60	60	Homemaker	92	92
5-6 members	29	29	Employed (service holder)	8	8
More than 6 members	11	11	Paternal occupation		
Type of family					
Nuclear	64	64	Service holder	48	48
Joint	36	36	Business	29	29
Maternal age (years)			Working abroad	23	23
15-25	39	39	Monthly household income (BDT)		
26-35	52	52			
≥36	9	9	12,500-21,500	9	9
Paternal age (years)			Above 21,500	91	91
15-25	3	3			
26-35	52	52			
≥36	45	45			

3.2 Characteristics and patterns of early screen exposure

Table 2 presents the characteristics and patterns of early screen exposure among the 100 children with speech delay. All 100 children (100%) had a reported history of screen exposure during early childhood.

Regarding the age at first screen exposure, 42% of children were introduced to screen devices between 8 and 13 months, while 38% had their first exposure between 14 and 18 months. Notably, 20% had been exposed to screen devices before 8 months of age.

Regarding device use during the 8-18-month period, mobile phones were the most commonly used devices (76%). A further 13% used both mobile phones and television, while 11% used television only.

In terms of daily screen exposure duration, 36% of children reportedly spent more than 180 minutes per day viewing screens. A further 29% had 120-180 minutes of exposure, 28% had 60-119 minutes, and 7% had less than 60 minutes. When the underlying continuous values (in minutes per day) were summarized, the mean daily screen exposure was 194.10 minutes (SD = 96.05), with a median of 180 minutes and an interquartile range of 120-240 minutes; observed values ranged from 60 to 600 minutes per day (*Table 3*).

Regarding viewing circumstances, more than half of the children (53.0%) reportedly viewed screens throughout the day. Screen viewing during meals was reported for 30%, while 11% were commonly exposed when their mothers were busy with domestic work and 6% before sleeping.

Cartoons were the predominant type of screen content (88%), whereas 12% primarily watched rhymes or music. Regarding content language, 59% of children were exposed to Bangla and foreign-language content, 30% to foreign-language content, and 11.0% to Bangla-language content.

Table 2: Characteristics and Patterns of Early Screen Exposure among Children with Speech Delay (N = 100)

Variables	n	%	Variables	n	%
Age at first screen exposure			Common screen-viewing circumstances		
Below 8 months	20	20	During meals	30	30
8–13 months	42	42	While mother was busy with domestic work	11	11
14–18 months	38	38	Before sleeping	6	6
Screen device used during 8–18 months			Throughout the day	53	53
Mobile phone only	76	76	Type of screen content viewed		
Television only	11	11	Cartoons	88	88
Both	13	13	Rhymes/music	12	12
Daily screen exposure duration			Language of screen content		
Less than 60 minutes	7	7	Bangla	11	11
60–119 minutes	28	28	Foreign language	30	30
120–180 minutes	29	29	Both	59	59
More than 180 minutes	36	36			

Table 3: Summary Statistics for Daily Screen Exposure (Minutes per Day) During 8-18 Months (N = 100)

Statistic	Value
Mean (minutes/day)	194.10
Standard deviation	96.05
Median (minutes/day)	180
Interquartile range (Q1-Q3)	120-240
Minimum	60
Maximum	600
Number of children (n)	100

3.3 Caregiving arrangements during early childhood

Table 4: Main Caregiver during the 8-18-Month Age Period (N = 100)

Main caregiver	n	%
Mother	87	87
Father	2	2
Other caregiver	2	2
Relatives	9	9

Table 4 describes the main caregiving arrangements during the children's 8-18-month age period. Mothers were the primary caregivers for most children (87%). Relatives were reported as the main caregivers for 9% of children, while fathers and other caregivers each accounted for 2%.

3.4 Retrospective early word production and guardians' perceived reasons for speech delay

Table 5 presents caregiver-reported information about early word production and guardians' perceptions of possible reasons for speech delay. Most caregivers (94%) reported that their children had produced 1-2 words during the 8-18-month ago period, whereas 6% reported that their children had not yet produced 1-2 words during this period.

Regarding perceived possible reasons for speech delay, 74% of guardians identified mobile phone and television exposure. Sickness was reported by 6%, while another 6% identified a lack of meaningful interaction time. Fourteen percent of guardians were unable to identify any possible reason. These responses reflect guardians' retrospective reports and personal perceptions and should not be interpreted as evidence of clinically established causes.

Table 5: Retrospective Early Word Production and Guardians' Perceived Possible Reasons for Speech Delay (N = 100)

Characteristics	n	%
Child's early word production during 8–18 months		
Yes (said 1–2 words)	94	94
No	6	6
Guardians' perceived possible reasons for speech delay		
Mobile phone and television exposure	74	74
Sickness	6	6
Lack of meaningful interaction time	6	6
Unknown reasons	14	14

4 DISCUSSION

4.1 Key Findings

This study explored the patterns of screen exposure in children with speech delay (n=100) aged between 8-18 months at a tertiary neurodevelopmental center in Bangladesh. All children had reported some screen exposure. Mobile phones were the most common device used by children. Over a third of children had reported exposure to screens for more than 3 hours per day (mean = 194.10 minutes [SD = 96.05]).

It was found that children often watched screens throughout the day or during mealtimes. The most commonly reported content type was cartoons. Most children had exposure to Bangla and foreign language content. Mothers were the main carers for most children. Crucially, it was found that most guardians reported their children saying 1-2 words during the 8-18 month period. Most guardians also believed that their children's speech delay could be due to their screen exposure. This reflects what caregivers have experienced and perceived but does not tell us when their speech delay started, or if screen media caused their speech delay.

4.2 Early introduction to screen devices

One fifth of children were reported to have been introduced to screens before the age of 8 months and 42.0% had their first exposure between 8-13 months.

As per recommendations from WHO it is advised to avoid sedentary screen time for children under one year old. Screen time should also be avoided for one year olds (WHO, 2019). Recommendations for children and digital media have been updated by the American Academy of Pediatrics to emphasis that recommendations should be made with the child's developmental needs, parental involvement, content and digital environment in mind (Munzer et al., 2026). This highlights the importance of encouraging children to do alternative activities such as playing interactively, communicating with their parents and engaging with age appropriate activities. However, this study does not contain a comparison group so we cannot interpret the findings of this study to mean that early screen exposure increases the risk of speech delay.

4.3 Device use and duration of screen exposure

The most commonly reported items were mobile phones. Over one-third of children had more than 180 minutes of screen time per day. The mean number of minutes of screen time was nearly three hours per day.

Madigan et al. (2020) found across their systematic review and meta-analysis that increased screen time was linked to poorer language abilities. However, they indicated that the content of what children are watching and whether parents watch with them can be important. This is supported by the updated AAP policy statement which highlights the importance of considering whether digital media is taking away from activities such as sleep, play, reading and physical activity (Munzer et al., 2026). However, this study was not conducted to look at the relationship between screen time and language abilities. Therefore the patterns of screen time should be seen as descriptive and cannot be used to indicate that the children experienced speech delays due to long periods of screen time.

4.4 Screen-viewing circumstances and content

Over half of the children had access to screens at some point during the day. Nearly one-third had regular access during mealtimes.

This highlights that screens may be used as part of everyday activities within the home. While most of the content was cartoons, and there was a lot of Bangla/foreign language content, it was not considered what type of quality content they were watching, if it was developmentally appropriate, if they were interacting with someone while watching and what language they were actually watching. The new AAP policy statement highlights the importance of considering factors such as family context, quality content, parental interaction and ensuring healthy offline activities (Munzer et al., 2026). Future studies could look at if the children are using screens on their own or with parental interaction, and if the content is age appropriate.

4.5 Caregiving arrangements and early communication

It was reported that mothers were the primary cares of most children. This gives an insight into the caring environment these children were in during their early screen exposure. Interactions with parents provide key opportunities for language development, For example, shared attention, responsive communication and play. Evidence suggests that parental co-viewing and educational content are positively associated with language development in children (Madigan et al., 2020). The new AAP policy statement also highlights the importance of parent interactions and the family environment (Munzer et al., 2026).

This supports the idea that parents should be educated on how to interact face to face with their children through storytelling, picture books, singing and playing. However this study did not collect data regarding how much interaction occurred between parents and children. So it is impossible to determine what level of interaction each child had.

4.6 Guardians' perceptions regarding speech delay

The majority of guardians mentioned excessive exposure to mobile phones and TV as a potential cause. There are many factors that can contribute to speech delay such as developmental, medical, environmental and social factors. As there was no control group and the timing of the exposure could not be assessed, it cannot be determined if the opinion of guardians actually caused the speech delay. However, it provides an opportunity to provide families with evidence based advice on healthy media use.

Strengths

This study provides a structured description of early screen exposure patterns among children with speech delay attending a tertiary neurodevelopmental center in Bangladesh. A notable strength is that the center receives patients from different districts across the country, allowing the study to include children from diverse geographical and socioeconomic backgrounds. This provides a broader perspective on early screen exposure patterns among children with speech delay in Bangladesh, beyond a single local community. The study also examined multiple dimensions of early screen exposure, including age at first exposure, device type, daily duration, viewing circumstances, content type, and content language. In addition, information on caregiving arrangements, early word production, and guardians' perceptions was collected to provide a more comprehensive description of children's early media environments.

Limitations

Several limitations should be considered when interpreting the findings. First, the study relied on retrospective caregiver reports, which may be affected by recall bias. Second, only children with speech delay were included; therefore, the study cannot establish an association or causal relationship between screen exposure and speech delay. Third, all participants had a history of screen exposure, preventing comparison with children without early screen

exposure. Fourth, although participants came from different districts across Bangladesh, recruitment from a single center using convenience sampling limits national representativeness and generalizability. Fifth, screen exposure was caregiver-reported rather than objectively measured. Content quality, co-viewing practices, and parent–child interaction were not assessed. Finally, early word production was retrospectively reported and was not evaluated using standardized developmental or language assessment tools.

5 CONCLUSION

This retrospective observational study provides an overview of early screen exposure patterns among 100 children with speech delay attending IPNA, BMU, Dhaka, including participants from different districts across Bangladesh and age at first exposure, device type, daily duration, viewing circumstances, content preferences, and caregiving arrangements. Mobile phones were the most commonly reported devices, while prolonged daily screen exposure and viewing during meals or throughout the day were frequently reported. These findings highlight the importance of understanding children's early media environments and promoting appropriate caregiver practices, including balanced screen use, responsive parent-child interaction, and language-rich activities. The inclusion of children from different districts also provides a broader clinical perspective on early screen exposure patterns in Bangladesh. Further comparative and prospective research is recommended to explore the relationship between early screen exposure and child language development.

Recommendations

- Promote caregiver education on age-appropriate screen exposure and responsible media practices during infancy and early childhood.
- Encourage parents to provide more opportunities for face-to-face communication, interactive play, storytelling, singing, and picture-book activities.
- Promote screen-free mealtimes and regular family interaction to support children's communication and social engagement.
- Strengthen caregiver counseling on responsive communication and the importance of language-rich home environments.
- Develop community-based awareness initiatives to reach caregivers from different geographical and socioeconomic backgrounds across Bangladesh.
- Conduct future comparative and prospective studies involving children with and without speech delay to better understand the relationship between early screen exposure and language development.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare that they have no competing interests.

Statement of ethical approval

According to applicable institutional guidelines for minimal-risk research, formal ethical approval was not required

Statement of informed consent

Participation in the study was voluntary, and verbal informed consent was obtained from all respondents prior to data collection. Participants were informed about the purpose of the study, confidentiality of their responses, and their right to withdraw at any stage of the interview process. Personal identifiers were not included in the data analysis or reporting process to maintain participant confidentiality.

Availability of data and materials

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to institutional and ethical restrictions.

Artificial Intelligence Statement

The authors used ChatGPT solely to assist with language editing and improve the clarity of the manuscript. All scientific content, data analysis, interpretation, and final responsibility for the manuscript remain with the authors.

Data availability statement

Data collected during this study are available from the corresponding author upon A reasonable request.

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