

Original Article

Screen Time Exposure and Its Impact on Development, Behaviour, and Visual Health in Children Aged 1–5 Years: A Hospital-Based Cross-Sectional Study

Kratika Neema¹, Mayank Patle¹, Astha Tiwari², Umesh Patel³From ¹Resident, ²Professor, ³Professor and HOD, Department of Paediatrics, RKDF Medical College Hospital and Research Centre, Bhopal, India

ABSTRACT

Background: Early childhood exposure to digital media has risen substantially with smartphones and other devices. Excessive screen use is linked to developmental delays, especially in language acquisition and social interaction. This study was done to determine the prevalence of screen time ≤ 60 minutes and >60 minutes among children aged 1–5 years, evaluate its impact on developmental, behavioral, and visual domains, and to formulate evidence-based recommendations for limiting screen use and promoting digital well-being in early childhood. **Materials and Methods:** A hospital-based, cross-sectional study was conducted at RKDF Medical College Hospital and peripheral units over 18 months. A total of 180 children aged 1–5 years were enrolled. Screen exposure was categorized as ≤ 60 minutes/day or >60 minutes/day. Developmental milestones were assessed using the Trivandrum Developmental Screening Chart (TDSC). Behavioral problems, visual disturbances, sleep duration, and physical activity were recorded. Associations were evaluated using the chi-square test. **Results:** 68.9% of children had screen time >60 minutes/day (mean 77.5 ± 44.5 min). Mobile phones were the most common device (41.7%). Social developmental delay was significantly more frequent in the >60 min/day group (21.8% vs 5.36%; $p = 0.018$). Visual disturbances were significantly associated with excessive screen time (24.2% vs 0%; $p < 0.001$), with digital eye strain being most common (15.3%). Behavioral problems showed a significant association ($p = 0.045$), mainly temper tantrums and inattention. Gross motor, fine motor, and sleep duration did not differ significantly. Language delays were observed only in the excessive screen time group. **Conclusion:** Excessive screen time is highly prevalent in young children in Bhopal and is significantly associated with social delay, visual disturbances, and behavioral problems. Pediatricians should routinely enquire about screen habits and counsel families on appropriate limits.

Key words: Child Development, Behavioural Problems

Digital media has become integral to family life, with children exposed from very early ages. In India, affordable smartphones and internet access have accelerated this trend, with caregivers often using devices to occupy children [1, 2]. The Indian Academy of Pediatrics (IAP) and WHO recommend no screen exposure for children under two years, and ≤ 1 hour/day for those aged 2–5 years [3]. Excessive use is linked to language delays, impaired social skills, attention difficulties, sleep disturbances, reduced physical activity, and visual strain [4, 5]. Despite clear guidelines, adherence remains inconsistent, and associations with developmental, behavioral, and visual outcomes in children aged 1–5 years are concerning [6].

MATERIAL AND METHODS

This was a single-centre, hospital-based, cross-sectional observational study. The study was conducted in the Department of Pediatrics at RKDF Medical College Hospital and Research Centre, Bhopal, Madhya Pradesh, including its peripheral outpatient units. A total of 180 Children aged between 1 and 5 years attending the pediatric outpatient and inpatient departments (OPD, IPD), or peripheral units were enrolled. Presence of a reliable parent or caregiver able to provide developmental history. Written informed consent was obtained from parents or legal guardians of all enrolled children before enrolment. Children with known congenital anomalies or chromosomal disorders, chronic illness, established neurological illness,

Access this article online

Received – 29th June 2026Initial Review – 04th July 2026Accepted – 20th July 2026

DOI: 10.32677/ijch.v13i7.8357

Quick Response Code



Correspondence to: Dr. Kratika Neema, Resident, Department of Paediatrics, RKDF Medical College Hospital and Research Centre, Bhopal, India.

Email: kratikaneema109@gmail.com

©2026 Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC-ND 4.0).

or sensory deficits (hearing loss, visual impairment) were excluded.

The primary outcome was the prevalence of screen time exceeding 60 minutes per day among children aged 1–5 years. Secondary outcomes included assessment of developmental milestones across gross motor, fine motor, language (expressive, receptive, and regression), and social domains using the Trivandrum Developmental Screening Chart (TDSC); a validated 51-item tool adapted from the Denver Developmental Screening Test and suitable for Indian children below six years. Associations between screen time category and each outcome were evaluated and analyzed using chi square/Fisher's exact test.

DATA COLLECTION PROCEDURE

Following enrolment, a structured, close-ended proforma was completed with the parent or guardian. The proforma captured sociodemographic data (age, gender, socioeconomic status by Modified Kuppaswamy scale, family type), maternal education, occupation, and working hours. Screen-related data included total daily screen time in minutes, type of devices used, primary purpose of use, and supervision during screen use. Daily physical activity and sleep duration were recorded. Behavioral problems were identified by structured parental reporting of tantrums, withdrawal, inattention, and hyperactivity. Visual disturbances including digital eye strain, myopia, and dry eyes were documented based on parental reporting and clinical observation. Developmental assessment was performed using the TDSC as described above. Participants were divided into two groups: screen time ≤ 60 minutes/day and screen time > 60 minutes/day.

Statistical Analysis: Data were coded and entered into Microsoft Excel and analyzed using Epi Info version 7.1.5. Categorical variables were expressed as frequencies and percentages. Associations between screen time category and developmental or behavioral outcomes were assessed using Pearson chi-square test or Fisher's exact test as applicable. A p-value of < 0.05 was considered statistically significant.

RESULTS

A total of 180 children aged 1–5 years were enrolled and analyzed. All participants had at least one digital screen device in the household. The detailed findings are presented below.

Table 1 shows that most children were aged 1–2 years, with boys forming a slight majority. Nuclear families predominated, and the upper lower socioeconomic class was most common. Illiterate mothers were the largest educational group, while professional/technical occupations

were most frequent. The sample reflects diverse sociodemographic backgrounds, with nuclear families and lower socioeconomic strata predominating, factors that may influence screen exposure. Table 2 shows that nearly 69% of children exceeded the recommended daily limit, with mobile phones as the most common device and cartoons/rhymes as the leading purpose. Supervision was inconsistent, with one quarter never supervised. Excessive screen use is widespread, driven by mobile phones and entertainment content, with limited parental oversight. Table 3 shows that motor delays were rare and not significant. Language delays (expressive, receptive, regression) appeared only in the > 60 min/day group. Social delay was significantly higher in the excessive group ($p = 0.018$). This shows that excessive screen time is strongly linked to social and language delays, while motor domains remain unaffected.

Table 4 shows that visual disturbances occurred only in the excessive group (24.2%), mainly digital eye strain. Behavioral problems, especially tantrums and inattention, showed significant association. Sleep duration was slightly shorter but not significant. Excessive screen exposure is clearly associated with visual strain and behavioral issues, though sleep outcomes were unaffected. Table 5 shows that maternal education, occupation, working hours, and family type showed no significant association with screen time, though children of illiterate mothers tended to have higher use. Excessive screen use cuts across maternal demographics, reflecting a pervasive issue influenced more by device access and cultural practices than parental factors.

DISCUSSION

This study evaluated the impact of excessive screen time on developmental, behavioral, and visual domains among children aged 1–5 years and found that 68.9% of children exceeded recommended screen time, with mobile phones as the most common device. Excessive exposure was significantly associated with social developmental delays, language delays, visual disturbances, and behavioral problems.

The findings of the present study align with those of Kerai *et al.* and Munamala *et al.*, who reported reduced cooperation and empathy in groups with high screen time [13,14]. Language delay was reported by Mustonen *et al.* and Christakis *et al.* [16,17]. Mutlu *et al.*, Panjeti Madan, and Ranganathan have found that visual disturbances are associated with excessive screen time, like our study [12,18]. Behavioral problems associated with screen time are also found in studies by Ramesh *et al.* and Muppalla *et al.* [11, 15]. In the study by Paldiwal *et al.*, maternal sociodemographic factors were significant in screen time

exposure in the children [20]. This was not a significant factor according to the present study results, reflecting the widespread device access across socioeconomic strata in Bhopal. The study has many limitations, as being cross sectional; follow-up or the long-term consequences of screen time influence cannot be verified. Since it is conducted at a single centre with convenience sampling, generalizability of the results is limited. Since the results are based on parental reporting, this can cause a recall bias in the results.

Therefore, future longitudinal, larger multi centre studies are needed to improve generalizability and capture long term effects of screen exposure. Future research should employ more detailed developmental tools, examine

parental behaviour, content type, and timing of screen use, and include interventional designs to evaluate whether reducing screen time can improve developmental and behavioral outcomes.

Pediatricians should routinely screen for media use and counsel families on age appropriate, supervised, interactive engagement. Screen time should be limited to less than one hour daily for children aged 2–5 years, and avoid screen use altogether for those under 2 years. Screen use during routine activities like feeding, calming, or before sleeping should be discouraged; instead, engage children with talking, storytelling, or play. Encourage at least 2–3 hours of outdoor play and physical activity daily to support healthy development and reduce reliance on screens

Table 1: Characteristics of Participants

Group	Category	Frequency (n)	Percentage (%)
Age Group (years)	1–2	56	31.11
	>2–3	40	22.22
	>3–4	43	23.89
	>4–5	41	22.78
Gender	Male	93	51.67
	Female	87	48.33
Socioeconomic Status (Modified Kuppuswamy)	Upper	30	16.67
	Upper Middle	34	18.89
	Lower Middle	37	20.56
	Upper Lower	46	25.56
	Lower	33	18.33
Type of Family	Nuclear	126	70.00
	Joint	38	21.11
	Extended	16	8.89
Maternal Education	Illiterate	49	27.22
	Primary	19	10.56
	High School	37	20.56
	Senior Secondary	35	19.44
	Graduate	40	22.22
Maternal Occupation	Housewife	38	21.11
	Unskilled work	39	21.67
	Service / Domestic	34	18.89
	Professional / Technical / Manager	55	30.56
	Other	14	7.78
Maternal Working Hours	Not employed	38	21.11
	< 8 hours/day	70	38.89
	8–12 hours/day	60	33.33
	> 12 hours/day	12	6.67

Table 2: Screen Time Prevalence, Device Use, and Supervision

Screen Time Parameter	Frequency (n) / Value	Percentage (%) / Range
Screen time ≤60 minutes/day	56	31.10
Screen time >60 minutes/day	124	68.90
Mean daily screen time (minutes)	77.5 ± 44.5	Range: 20–180 min
Most Common Device Used (multiple responses)		
Mobile phone	75	41.7
Television/ Screen	63	35.0
Tablet	49	27.2
Video game	35	19.4
Primary Purpose of Screen Use		
Cartoons / Rhymes	52	28.89
Games	45	25.00
Education	43	23.89
Other	40	22.22
Supervision During Screen Use		
Always	33	18.33
Most of the time	42	23.33
Sometimes	57	31.67
Never	48	26.67

Table 3: Screen Time and Developmental Milestones

Developmental Domain / Outcome	≤60 min/d n=56 Normal n (%)	≤60 min/d Delayed n (%)	>60 min/d n=124 Normal n (%)	>60 min/d Delayed n (%)	P-value
Gross motor	56 (100)	0 (0)	123 (99.2)	1 (0.8)	0.503 (NS)
Fine motor	56 (100)	0 (0)	121 (97.6)	3 (2.4)	0.244 (NS)
Expressive language	56 (100)	0 (0)	106 (85.5)	18 (14.5)	NA
Receptive language	56 (100)	0 (0)	111 (89.5)	13 (10.5)	NA
Language regression	56 (100)	0 (0)	115 (92.7)	9 (7.26)	NA
Social domain	53 (94.6)	3 (5.36)	97 (78.2)	27 (21.8)	0.018*

* Language delays appeared only in the >60 min/d group; no delay in ≤60 min/d group (Fisher's exact applicable). Social domain was statistically significant (p = 0.018). NS=Not Significant, NA= Not Applicable

Table 4: Visual Disturbances, Behavioral Problems, and Sleep Duration by Screen Time Category

Outcome	≤60 min/d n=56 n (%)	>60 min/d n=124 n (%)	Total n (%)	P-value
Visual Disturbances				
None	56 (100)	94 (75.8)	150 (83.3)	< 0.001
Digital eye strain	0 (0)	19 (15.3)	19 (10.6)	
Myopia	0 (0)	6 (4.84)	6 (3.33)	
Dry eyes	0 (0)	5 (4.03)	5 (2.78)	
Behavioral Problems				
No Behavioral problems	46 (82.1)	100 (80.6)	146 (81.1)	0.045
Temper tantrums	5 (8.93)	13 (10.5)	18 (10.0)	
Inattention / Hyperactivity	3 (5.36)	8 (6.45)	11 (6.1)	
Social withdrawal	2 (3.57)	3 (2.42)	5 (2.8)	

Sleep Duration				
> 10 hours	49 (87.5)	102 (82.3)	151 (83.9)	0.392 (NS)
< 10 hours	7 (12.5)	22 (17.7)	29 (16.1)	

Table 5: Maternal Determinants of Screen Time Category

Maternal Factor	≤60 min/d n=56 n (%)	>60 min/d n=124 n (%)	P-value
Maternal Education			
Illiterate	11 (19.6)	38 (30.6)	0.071 (NS)
Primary	9 (16.1)	10 (8.06)	
High School	17 (30.4)	20 (16.1)	
Senior Secondary	8 (14.3)	27 (21.8)	
Graduate	11 (19.6)	29 (23.4)	
Maternal Occupation			
Housewife	13 (23.2)	25 (20.2)	0.947 (NS)
Unskilled	11 (19.6)	28 (22.6)	
Service / Domestic	10 (17.9)	24 (19.4)	
Professional / Technical	18 (32.1)	37 (29.8)	
Other	4 (7.14)	10 (8.06)	
Maternal Working Hours			
Not employed	13 (23.2)	25 (20.2)	0.236 (NS)
< 8 hours	24 (42.9)	46 (37.1)	
8–12 hours	14 (25.0)	46 (37.1)	
> 12 hours	5 (8.93)	7 (5.65)	
Family Type			
Nuclear	37 (66.1)	89 (71.8)	0.052 (NS)
Joint	12 (21.4)	26 (21.0)	
Extended	7 (12.5)	9 (7.26)	

CONCLUSION

Excessive screen time is highly prevalent among young children and is significantly associated with social and language delays, visual disturbances, and behavioral problems, while motor and sleep outcomes remain unaffected. Routine screening of media use and parental counselling on age appropriate, supervised engagement are essential to safeguard healthy development.

REFERENCES

- Rideout VJ, Hamel E. The media family: electronic media in the lives of infants, toddlers, preschoolers and their parents. Menlo Park (CA): Kaiser Family Foundation; 2006.
- Indian Academy of Pediatrics. IAP health advisory: screen time and children. New Delhi: IAP; 2022.
- World Health Organization. Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. Geneva: WHO; 2019.
- Stiglic N, Viner RM. Effects of screen time on the health and well being of children and adolescents: a systematic review of reviews. *BMJ Open*. 2019;9(1):e023191.
- Oswald TK, Rumbold AR, Kedzior SGE, Moore VM. Psychological impacts of screen time and green time for children and adolescents: a systematic scoping review. *PLoS One*. 2020;15(9):e0237725.
- Shonkoff JP, Phillips DA, editors. From neurons to neighbourhoods: the science of early childhood development. Washington (DC): National Academy Press; 2000.
- Khobragade AW, et al. Screen time in under five children in India: a systematic review and meta analysis. *Indian Pediatr*. 2025.
- Shirley SA, Kumar M. Screen time in children aged 24–60 months: patterns and demographics in Tamil Nadu. *Indian J Pediatr*. 2019;86(12):1102–7.
- John M, et al. Screen time among under five children in urban India. *J Clin Diagn Res*. 2021;15(3):SC01–04.
- Varadarajan S, et al. Screen time and developmental outcomes in children under 5 years in India: a population based study. *Ann Indian Acad Pediatr*. 2021;57(4):320–6.
- Ramesh MS, et al. Screen time, device access, and child development outcomes in India. *J Trop Pediatr*. 2024;70(2):145–52.
- Mutlu N, et al. Electronic device usage and child development: a cross sectional study. *Child Dev Res*. 2024;12(1):33–41.
- Kerai S, et al. Screen time and developmental vulnerability in children: a prospective cohort study. *BMC Pediatr*. 2022;22(1):145.

14. Munamala RR, et al. Social skill scores and screen time in Indian children: a comparative study. *Pediatr Res*. 2024;96(5):1120–6.
15. Muppalla SK, et al. Effects of excessive screen time on child development: a narrative review. *Cureus*. 2023;15(6):e40828.
16. Mustonen R, et al. Screen time and language development in children: longitudinal evidence. *J Child Lang*. 2022;49(3):512–28.
17. Christakis DA, et al. Audible television and decreased adult words, infant vocalizations, and conversational turns. *Arch Pediatr Adolesc Med*. 2009;163(6):554–8.
18. Panjeti Madan VN, Ranganathan P. Impact of screen time on children's development: cognitive, language, communication and learning outcomes. *J Br Acad*. 2023;11(Suppl 1):57–77.
19. Joseph HB, et al. Screen exposure and sleep in infants and toddlers in eastern India. *Indian J Pediatr*. 2022;89(8):713–9.
20. Paldiwal A, et al. Prevalence and predictors of screen time in under six children in Akola, India. *J Pediatr Res India*. 2024;11(2):101–7.
21. Gayathri S, et al. Screen time profiling and risk factors in under five children in rural Tamil Nadu. *Indian J Community Med*. 2023;48(1):45–50.

How to cite this article: Neema K, Patle M, Tiwari A, Patel U. Screen Time Exposure and Its Impact on Development, Behaviour, and Visual Health in Children Aged 1–5 Years: A Hospital-Based Cross-Sectional Study. *Indian J Child Health*. 2026; 13(7):89-94.

Funding: None; Conflicts of Interest: None Stated