# The Effect of Screen Time on Growth, Development, Behavior, and Sleep in Preschool Children: A Cross-Sectional Study

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## Abstract

**Introduction**: This study aimed to determine the prevalence of screen time and its impact on growth, development, behavior, and sleep in children less than five years old.

**Methods**: Children between six months to five years, attending the outpatient department of our hospital, were included consecutively. Screen exposure details were collected in a predesigned validated semi-structured questionnaire. Development was screened by the ages and stages-3 questionnaire. Growth was assessed as per World Health Organization guidelines. Data were analyzed using STATA version 12. Multivariate logistic regression analysis was conducted to ascertain the association between screen time and growth, development, behavior, and sleep, after adjusting for confounders.

**Results:** There were 437 participants. The prevalence of excess screen time was 61.5% and 72.8% in children aged 6-23 months and 24-60 months respectively. Excess screen time did not significantly impact growth and development. The odds of having temper tantrums - adjusted odds ratio = 10.61 (2.57-43.80), $p$ = 0.001 - and breath-holding spells - adjusted odds ratio = 61.39 (3.28-1151.09), $p$ = 0.001) were significantly more in children aged 6-23 months with excess screen time, while children aged 2-5 years of age with excess screen time, had a significantly higher occurrence of nightmares - adjusted odds ratio = 5.26 (1.12-72.70), $p$ = 0.04) and delayed bed time (beyond 10:00 PM) - adjusted odds ratio = 4.42 (1.46-13.36), $p$ = 0.008).

**Conclusion:** There was a high prevalence of excess screen time in preschoolers. Increased screen time did not significantly affect growth and development. There was a higher occurrence of temper tantrums, breath-holding spells, nightmares, and a bedtime beyond 10:00 PM in children with excess screen time.

**Keywords:** Child; Child Development; Child, Preschool; India; Problem Behavior; Screen Time; Sedentary Behavior; Sleep; Surveys and Questionnaires

### Keypoints

**What is known:**
- Excess screen time has adverse consequences in children.
- Developmental problems are associated with excess screen time.
- Aggressive behavior is found in older children with higher screen exposure.

**What is added:**
- There is a high prevalence of excess screen time in preschool children.
- Screen time is associated with behavioral problems such as temper tantrums and breath-holding spells in preschool children.

## Introduction

With advances in technology, electronic media has become part and parcel of our lives. Young children's media exposure is on the rise and is of concern due to the various adverse consequences. Increased screen time (ST) has been found to affect the development and behavior of children below five years.[1-4] The reduced physical activity associated with excess screen time indirectly leads to obesity and the risk of non-communicable diseases in the future.[5] The American Academy of Pediatrics (AAP), World Health Organization (WHO), and Indian Academy of Pediatrics have laid down guidelines for screen time in various age groups.[6-8] Despite these recommendations, studies have shown a very high prevalence of excess screen time.[9,10]

There are very few studies from low- and middle-income countries on the impact of screen time in children,

especially below five years.[3,9] In this background, this study was conducted to ascertain the prevalence of screen time and its effect on growth, development, behavior, and sleep in children aged six months to five years.

## Methods

This was a cross-sectional study, conducted in a tertiary hospital in Pondicherry, India, from January 2020 to June 2021. Children aged six months to five years of age, attending the pediatric outpatient department formed the study group. Those requiring hospitalization, those with chronic systemic illnesses, chronic infections (tuberculosis, human immunodeficiency virus), neurological, and/or behavioral problems were excluded from the study. Consecutive children fulfilling the inclusion criteria were recruited after getting informed written consent from the parents.

Based on a previous study,[10] 60% was taken as the prevalence of screen time and the sample size was calculated to be 430, with an absolute precision of 10% and an additional non-response rate of 10%.

Data including demographic details of the child, age of initiation to the screen, duration, and nature of screen time, were collected on a predesigned and validated (by pretesting and back translation) semi-structured questionnaire. The questionnaire covered data on the pattern of media exposure in children and the parental attitude towards screen time. Based on AAP guidelines, excess screen time was defined as any screen time per day for children aged six months to two years and more than one hour per day for those aged 2-5 years.[7]

### Outcome variables
### Growth
The child's growth was assessed by anthropometry which included weight, height, and mid-arm circumference. Height and weight were measured to the nearest 0.1 cm and 0.1 kg respectively. The weight-for-age, height-for-age, weight-for-height, and body mass index were plotted in WHO growth charts and interpreted as per WHO guidelines.[11] Children with weight-for-age < -3 standard deviation (SD) were taken as severely underweight, between -2 to -3 SD were taken as underweight, and between -2 to +2 SD were taken as normal weight. Length or height-for-age between -2 to -3 SD were taken as stunting, < -3 SD were taken as severe stunting, and between -2 to +2 SD were taken as normal height. Children with weight-for-height or length < -3 SD were taken as severe wasting, between -2 to -3 SD were

taken as wasting, and between -2 to +2 SD were taken as normal nutritional status. Body mass index between +2 to +3 SD was taken as overweight and > +3 SD was taken as obesity, respectively. Mid-arm circumference below 13.5 cm was taken as undernutrition.

### Behavior
The presence of behavioral problems such as temper tantrums, inattention, hyperactivity, nightmares, and breath-holding spells was ascertained by a predesigned questionnaire based on child behavior checklist for preschoolers (CBCL)[12] and diagnostic and statistical manual of mental disorders (DSM-5) criteria.[13] Temper tantrums were considered significant if the frequency of any of the behaviors such as excessive crying / screaming / throwing items / pushing / hitting / biting was more than one episode per day. Nightmares and breath-holding spells were diagnosed if the child had at least one episode in the previous two months. For diagnosis of hyperactivity and inattention, the questions were based on DSM-5 criteria.[13]

### Development
The developmental screening was done using the ages and stages questionnaire third edition (ASQ-3) and scoring was done in five domains (gross motor, fine motor, language, personal-social, and problem-solving).[14] In each domain, the parent's answers were scored and the total score of the child was plotted. When the child's total score was found to be below the cut-off for age, it was considered a delay in that domain.

### Sleep
The sleep pattern of the child was assessed in the questionnaire. The duration of nighttime sleep per day was ascertained as < 10 hours, and > 10 hours. Daytime sleepiness was considered as significant if the parent-reported any behavior associated with daytime somnolence.[15] A bedtime after 10:00 PM was considered a delayed bedtime.

To maintain uniformity and avoid observer bias, a single investigator was designated to collect the data and measure anthropometry in all the children.

### Statistical methods
Data were entered in excel sheet and analysis was conducted by STATA version 12 (College Station, Texas, United States of America). Descriptive statistics comprised of percentages, averages, and frequencies. Since the screen time was positively skewed, the Spearman correlation coefficient was used to analyze the correlates of screen time. The chi-square test was

applied for categorical variables. Univariate analysis was followed by multivariate logistic regression. Firth logistic regression was used where variables were zero. A *p*-value less than 0.05 was considered statistically significant.

## Results

Out of 1000 children, there were a total of 437 consecutive children fulfilling the inclusion criteria. The flow of events is shown in Fig. 1. There were 264 boys and 173 girls. The mean age was 31.4 (18.8) months. Most of the children were firstborn (66%). All the parents were literate. More than 90% of mothers were homemakers. A majority of the children were from joint families (65%) and the mother was the primary caregiver (95%) for most children.

The media exposure characteristics of the study population are shown in Table 1. The smartphone was available in all the households. Children were using smartphones more frequently than any other electronic device (62.5%). Only eight children watched the computer. The earliest age of exposure was two months, and the average age of exposure was ten months. The prevalence of excess screen time was 61.5% and

72.8% in children aged 6-23 months and 24-60 months respectively. Children's screen time duration was more on weekdays rather than weekends (Table 1).

In children below two years, the most common content watched was songs and rhymes (78%), whereas, in 2-5 years of age, the most preferred content was stories and cartoons (82%). Mother was the main person who had introduced mobile phones (children aged 6-23 months - 73%, children aged 24-60 months - 68%), computer (children aged 6-23 months - 100%, children aged 24-60 months - 83%), and television (children aged 6-23 months - 67%, children aged 24-60 months - 71%) in both the age groups. The common reasons for introducing electronic devices were to calm the child (23%) and to increase food intake (19%) in below two years, and in above two years, the reasons were to increase food intake (39%) and to entertain the child (26%). Most parents felt that screen time is beneficial (62%) to their kids rather than harmful. The perceived advantages of screen time by the parents were it calms the child (17%), aids in increasing food intake (25%), is educative (65%), and entertains them (16%). The disadvantages perceived by the parents were vision problem (61%), addiction / bad habit (15%), radiation hazard (3%), and a decrease in concentration (10%).

Univariate analysis of the association of the child's screen time with growth, development, behavior, and sleep is

| Table 1. Screen exposure characteristics of the study population | | |
|---|---|---|
| **Variables** | **Children aged 6-23 months (n = 187)** | **Children aged 24-60 months (n = 250)** |
| **Number of electronic devices per household, median (interquartile range)** | | |
| Television | 1 (1, 1) | 1 (1, 1) |
| Smartphone | 2 (1, 2) | 2 (1, 2) |
| Computer, tablet | 0 (0, 0) | 0 (0, 0) |
| **Frequency of devices used by children, n (%)** | | |
| Television | 58 (31.2) | 190 (76.0) |
| Smartphone | 88 (47.1) | 197 (78.8) |
| Computer, tablet | 3 (1.6) | 6 (2.4) |
| **Screen time per day of the children on weekdays (hours), median (interquartile range)** | | |
| Smartphone | 0.2 (0, 0.5) | 1 (0.3, 2) |
| Television | 0.1 (0, 0.2) | 1 (0.2, 2) |
| Total duration | 0.3 (0, 1) | 2.5 (1, 4) |
| **Screen time per day of the children on weekends (hours), median (interquartile range)** | | |
| Smartphone | 0.2 (0, 0.5) | 0.5 (0,1) |
| Television | 0.1 (0, 0.2) | 1 (0, 2) |
| Total duration | 0.2 (0, 0.7) | 2 (1, 4) |
| **Type of screen time exposure of the children*, n (%)** | | |
| Recommended screen time | 72 (38.5) | 68 (27.2) |
| Excess screen time | 115(61.5) | 182 (72.8) |

*As per American Academy of Pediatrics guidelines, any screen exposure per day in children between 6 months to 2 years was considered as excess screen time. In children above 2 years, a screen time of more than one hour per day was considered as excess screen time.

shown in Table 2. In our study, over 80% of the children had normal weight and height / length, irrespective of screen time. Head circumference was normal for all children. A significantly higher proportion of children above two years with excess screen time had normal nutritional status, but the correlation was weak (*p* = 0.03, rho = 0.13). In below two years, severe stunting was more common in children with recommended screen time, with a weak correlation (*p* = 0.04, rho = -0.19). For the association of development with screen time, the mean ASQ-3 score in each of the five developmental domains was correlated with screen time. It was found that language delay was significantly more in children with recommended screen time in two to five years of age. However, the correlation was weak (*p* = 0.02, rho = -0.15). It was observed that temper tantrums (*p* = 0.001, rho = 0.26) and breath-holding spells (*p* = 0.001, rho = 0.32) were significantly associated with excess screen time in children below two years, with moderate correlation. The nighttime sleep duration and daytime

| Table 2. Univariate analysis of association of screen time with growth, development, behavior and sleep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | | Children aged 6-23 months | | | | Children aged 24-60 months | | | |
| | | Recommended ST (n = 72) | Excess ST (n = 115) | *p* value | Rho value | Recommended ST (n = 68) | Excess ST (n = 182) | *p* value | Rho value |
| Growth disorders (n) | Underweight | 7 | 10 | 0.81 | -0.02 | 8 | 9 | 0.05 | -0.12 |
| | Severely underweight | 1 | 2 | 0.85 | 0.01 | 1 | 0 | 0.10 | -0.10 |
| | Stunting | 4 | 9 | 0.55 | 0.04 | 4 | 9 | 0.77 | -0.02 |
| | Severe stunting | 4 | 0 | **0.04** | **-0.19** | 1 | 0 | 0.35 | -0.10 |
| | Wasting | 9 | 9 | 0.75 | -0.01 | 10 | 12 | 0.16 | -0.13 |
| | Severe wasting | 0 | 2 | 0.70 | 0.08 | 1 | 0 | 0.95 | 0.04 |
| | Normal nutrition | 61 | 104 | 0.01 | 0.09 | 60 | 174 | **0.03** | **0.13** |
| | Under nutrition | 11 | 11 | 0.42 | 0.09 | 8 | 8 | 0.07 | 0.13 |
| | Overweight and obese | 1 | 3 | 0.32 | 0.17 | 2 | 3 | 0.008 | -0.04 |
| Developmental delay (n) | Gross motor | 1 | 3 | 0.58 | 0.04 | 4 | 6 | 0.35 | -0.06 |
| | Fine motor | 3 | 7 | 0.57 | 0.04 | 2 | 6 | 0.88 | 0.01 |
| | Language | 3 | 10 | 0.24 | 0.24 | 6 | 4 | **0.02** | **-0.15** |
| | Personal social | 5 | 10 | 0.67 | 0.03 | 1 | 8 | 0.27 | 0.07 |
| | Problem solving | 3 | 12 | 0.13 | 0.11 | 4 | 11 | 0.96 | 0.00 |
| Behavioral problems (n) | Temper tantrums | 3 | 27 | **0.00** | **0.26** | 16 | 54 | 0.34 | 0.06 |
| | Inattention | 3 | 4 | 0.81 | -0.18 | 6 | 6 | 0.07 | -0.12 |
| | Hyperactivity | 3 | 6 | 0.74 | 0.02 | 4 | 14 | 0.62 | 0.03 |
| | Nightmares | 2 | 2 | 0.63 | -0.03 | 2 | 19 | 0.06 | 0.12 |
| | Breath holding spell | 0 | 26 | **0.00** | **0.32** | 2 | 15 | 0.14 | 0.09 |
| Sleep time at night (n) | Bedtime before 10:00 PM | 56 | 97 | 0.26* | | 64 | 140 | **0.002*** | |
| | Bedtime after 10:00 PM | 16 | 18 | | | 4 | 42 | | |
| Daytime sleepiness (n) | Present | 65 | 92 | 0.06* | | 38 | 104 | 0.86* | |
| | Absent | 7 | 23 | | | 30 | 78 | | |
| Nighttime sleep duration (n) | < 8 hours | 4 | 0 | 0.11 | -0.08 | 1 | 9 | 0.28 | -0.13 |
| | 8-10 hours | 38 | 87 | | | 54 | 147 | | |
| | > 10 hours | 30 | 28 | | | 13 | 26 | | |

ST - screen time.
* Chi-square test.

sleepiness were not affected by screen time in both age groups. Bedtime beyond 10:00 PM was significantly more in children between two and fivw years, with excess screen time (*p* = 0.002).

Multivariate logistic regression was carried out for the association of growth, development, behavior, and sleep with screen time and odds ratio (OR) were obtained after adjusting for the following confounders: gender, birth order, type of family, socio-economic status, education and occupation of the mother (Table 3). Growth and development did not show a significant association with screen time in all children from six months to five years. The odds of having temper tantrums - adjusted

odds ratio (AOR) = 10.61 (2.57-43.80), *p* = 0.001 - and breath-holding spells - AOR = 61.39 (3.28-1151.09), *p* = 0.001) were significantly more in children aged 6-23 months with excess screen time. Children above two years with increased screen time, had a significantly higher occurrence of nightmares - AOR = 5.26 (1.12-72.70), *p* = 0.04. The nighttime sleep duration and daytime sleepiness were not associated with screen time. Howsoever, the odds of bedtime after 10:00 PM in children aged 2-5 years with excess screen time were 4.42 (1.46-13.36) (*p* = 0.008) times higher as compared to children with recommended screen time in the same age group.

**Table 3. Multivariate regression analysis of association of screen time with growth, development, behavior and sleep**

| Variables | | Children aged 6-23 months Excess ST *versus* recommended ST | | | | Children aged 24-60 months Excess ST *versus* recommended ST | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | OR (95% CI) | *p* value | AOR (95% CI) | *p* value | OR (95% CI) | *p* value | AOR (95% CI) | *p* value |
| Growth | Underweight and severe underweight | 0.93 (0.36-2.40) | 0.88 | 1.14 (0.42-3.15) | 0.79 | 0.34 (0.13-0.90) | 0.03 | 0.67 (0.21-2.09) | 0.49 |
| | Stunting and severe stunting | 0.68 (0.25-1.84) | 0.45 | 0.84 (0.27-2.58) | 0.76 | 0.66 (0.21-2.03) | 0.47 | 0.73 (0.22-2.44) | 0.61 |
| | Wasting and severe wasting | 0.74 (0.29-1.07) | 0.53 | 0.97 (0.35-2.65) | 0.95 | 0.45 (0.18-1.07) | 0.07 | 0.85 (0.31-2.37) | 0.76 |
| | Under nutrition | 0.59 (0.24-1.43) | 0.24 | 0.74 (0.28-1.94) | 0.54 | 0.34 (0.12-0.96) | 0.04 | 0.70 (0.21-2.34) | 0.56 |
| | Overweight and obese | 4.51 (0.23-88.62) | 0.32 | 3.56 (0.15-84.31) | 0.43 | 0.55 (0.09-3.38) | 0.53 | 13.54 (0.29-626.62) | 0.18 |
| Development | Gross motor | 1.90 (0.19-18.64) | 0.58 | 3.09 (0.24-39.25) | 0.39 | 0.55 (0.16-1.99) | 0.36 | 0.40 (0.09-1.75) | 0.22 |
| | Fine motor | 1.49 (0.37-5.96) | 0.57 | 1.96 (0.43-8.84) | 0.38 | 1.13 (0.22-5.71) | 0.89 | 1.52 (0.24-9.63) | 0.65 |
| | Language | 2.19 (0.58-8.24) | 0.25 | 2.31 (0.60-8.97) | 0.23 | 0.23 (0.06-0.85) | 0.03 | 0.25 (0.06-1.06) | 0.06 |
| | Personal social | 1.28 (0.42-3.89) | 0.67 | 1.36 (0.37-4.96) | 0.65 | 3.08 (0.38-25.10) | 0.29 | 6.43 (0.57-72.91) | 0.13 |
| | Problem solving | 2.68 (0.73-9.85) | 0.14 | 3.82 (0.84-17.37) | 0.08 | 1.03 (0.32-3.35) | 0.96 | 0.10 (0.28-3.56) | 0.10 |
| Behavior | Temper tantrums | **7.05 (2.05-24.23)** | **0.001** | **10.61 (2.57-43.80)** | **0.001** | 1.37 (0.7-2.61) | 0.33 | 1.70 (0.81-3.58) | 0.001 |
| | Inattention | 0.83 (0.18-3.81) | 0.81 | 1.39 (0.26-7.51) | 0.31 | 0.35 (0.10-1.13) | 0.07 | 0.49 (0.12-2.07) | 0.001 |
| | Hyperactivity | 1.27 (0.31-5.22) | 0.74 | 1.20 (0.27-5.29) | 0.57 | 1.33 (0.42-4.20) | 0.62 | 1.41 (0.41-4.92) | 0.12 |
| | Nightmares | 0.62 (0.09-4.49) | 0.64 | 0.30 (0.01-6.93) | 0.45 | 3.84 (0.81-16.98) | 0.08 | **5.26 (1.12-72.70)** | **0.04** |
| | Breath holding spells | **42.93 (2.57-716.63)** | **0.009** | **61.39 (3.28-1150.09)** | **0.001** | 2.4 (0.62-9.64) | 0.21 | 3.10 (0.73-13.20) | 0.001 |
| Sleep time | Bedtime after 10:00 PM | 0.65 (0.31-1.37) | 0.26 | 0.68 (0.30-1.53) | 0.35 | **4.8 (1.65-13.96)** | **0.004** | **4.42 (1.46-13.34)** | **0.008** |
| Daytime sleepiness | Present | 0.43 (0.17-1.06) | 0.02 | 0.43 (0.17-1.11) | 0.08 | 1.05 (0.60-1.84) | 0.86 | 1.13 (0.61-2.11) | 0.68 |
| Nighttime sleep duration | Sleep duration < 8 hours | 0.07 (0.003-1.24) | 0.07 | 0.07 (0.004-1.44) | 0.09 | 3.49 (0.43-28.04) | 0.24 | 2.98 (0.34-26.44) | 0.32 |

AOR - adjusted odds ratio; OR - odds ratio; ST - screen time.
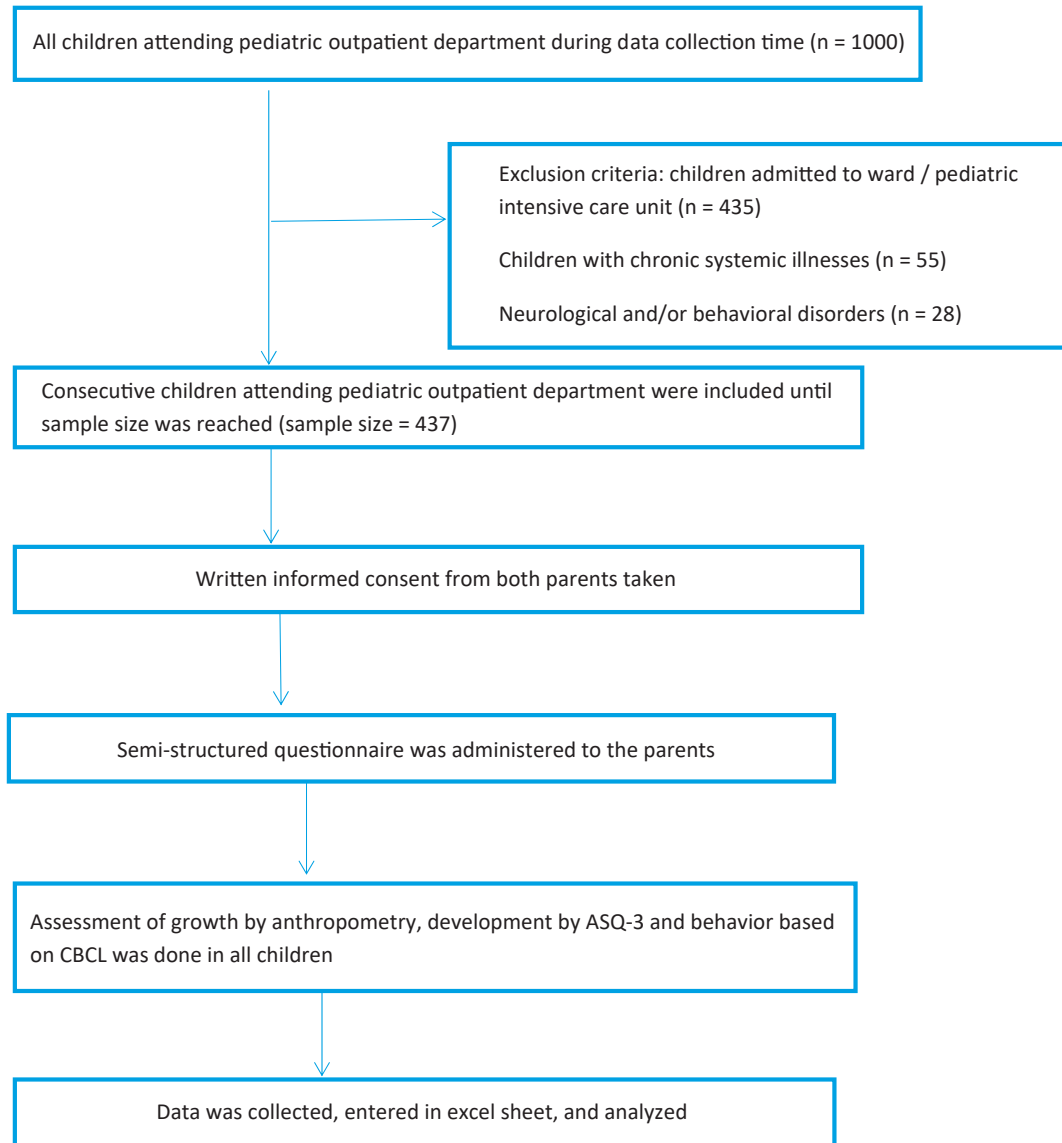
ASQ-3 - ages and stages questionnaire - third edition; CBCL - child behavior checklist for preschoolers.
**Figure 1.** Flow of events in the study.

## Discussion

We found a high prevalence (70%) of excess screen time in preschool children in our study. This is in line with similar studies conducted in India which showed a prevalence of 73%[9] and 88%.[3] While some authors[3] observed that 76% of preschoolers viewed television against 51% using smartphones, others found that 89% used television against 96% using smartphones.[16] But in our study, the most frequently used device was the smartphone. This could be due to the easier access to smartphones nowadays, and further, smartphones are less heavy than other devices and hence easier to handle by preschool children. In another study it was observed that the screen time was higher on weekends than on weekdays in children between 3-5 years of age,[17] but in our study, we found a marginally lesser screen time on holidays. This could probably be due to more parental time with the children and outdoor activities on holidays. Several researchers have observed the increased incidence of overweight and obesity associated with excess screen time in preschoolers and adolescents.[5,10,18] This is probably due to physical inactivity and increased consumption of unhealthy food while watching media. However, our study showed no association between obesity and excess screen time. This could be because the study was conducted during the covid pandemic when there were frequent lockdowns and shops were closed, hence people had less access to junk food.

Our study showed that there was no developmental

delay in any domain in preschool children with excess screen time. This is in contrast to a study, which showed an increased risk of language delay with increasing television watching time in toddlers.[19] Further it was also observed that increased television exposure was associated with a higher risk of motor, language, and cognitive development.[4] While it was observed increased word output if appropriate media is shown to toddlers,[20] some authors found that communication is not affected by media use in toddlers.[21] These differences could be due to varying sample sizes, time period of the study and electronic devices used. More studies need to be conducted focusing on the use of smartphone and its impact on child development.

Screen time has been found to influence the behavior of preschoolers.[1,2,22] There was an increased risk of temper tantrums and breath-holding spells in children below two years in our study. Furthermore, children between 2-5 years with increased screen time had a higher risk of nightmares. This is in concordance with the findings of authors who observed problems such as aggression, rule-breaking behavior, and thought problems in children aged 9-10 years.[23] It has been observed that violence in video games increases aggression by increasing stress.[24] In contrast,[2] it was found no association of screen time with aggression in preschoolers.[2] Higher screen time has been found to increase the risk of inattention problems in preschoolers.[2] However, our study found no such association between screen time and inattention.

While a study found a longer sleep onset latency and shorter total sleep duration with media usage in toddlers,[25] we did not find any significant association between screen time and duration of sleep and daytime sleepiness in our study. However, we observed a delayed bedtime in children above two years with excess screen time. Many researchers have found that media exposure affects sleep hygiene in children.[26-29]

We were able to study several variables associated with screen time and the topic is of relevance in the current era, which we consider as strengths of the study. There were limitations too. This was a cross-sectional study. Rather, a focused cohort study on specific variables would have been more useful. The study was conducted during the covid pandemic period when the old routine

was replaced by a new routine in most households. Many environmental factors have not been considered. In conclusion, we find a high prevalence of excess screen time in children below five years of age. Increased screen time was not significantly associated with growth and development. Temper tantrums and breath-holding spells were higher in children below two years with excess screen time. Nightmares and a bedtime beyond 10:00 PM were more common in children aged 2- 5 years with excess screen time. We recommend larger, focused cohort studies, concentrating on specific electronic devices.

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## Efeito do Tempo de Exposição a Ecrãs no Crescimento, Desenvolvimento, Comportamento e Sono de Crianças Pré-Escolares: Um Estudo Transversal

**Introdução:** Este estudo pretendeu determinar a prevalência do tempo de exposição a ecrãs e seu impacto no crescimento, desenvolvimento, comportamento e sono em crianças com menos de 5 anos.

**Métodos:** Foram incluídas consecutivamente crianças com 6 meses a 5 anos de idade, que foram atendidas em ambulatório no nosso hospital. Os pormenores relativos à exposição a ecrãs foram recolhidos num questionário semi-estruturado validado e pré-desenhado. O desenvolvimento foi avaliado através do questionário idades e fases (ASQ-3). O crescimento foi avaliado de acordo com as directrizes da Organização Mundial de Saúde. Os dados foram analisados utilizando o programa STATA versão 12. Foi realizada uma análise de regressão logística multivariada para determinar a associação entre o tempo de ecrã e o crescimento, desenvolvimento, comportamento e sono, após ajustamento para efeitos confundidores.

**Resultados:** Foram incluídos 437 participantes. A prevalência de excesso de tempo de ecrã (qualquer tempo de ecrã por dia para crianças dos 6 meses aos 2 anos de idade e mais de uma hora por dia para os 2-5 anos de idade) foi de 61,5% e 72,8% em crianças de 6-23 meses e 24-60 meses, respetivamente. O tempo de ecrã em excesso não teve um impacto significativo no crescimento e desenvolvimento. As probabilidades de ocorrência de birras - *odds ratio* ajustada = 10,61 (2,57-43,80), *p* = 0,001) - e episódios de retenção de respiração - *odds ratio* ajustada = 61,39 (3,28-1151,09), *p* = 0,001 - foram significativamente maiores em crianças de 6-23 meses de idade com excesso de tempo de ecrã, enquanto nas crianças de 2-5 anos de idade com excesso de tempo de ecrã, a ocorrência de pesadelos - *odds ratio* ajustada = 5,26 (1,12-72,70), *p* = 0,04 - e atraso na hora de dormir (para além das 22 horas) - *odds ratio* ajustada = 4,42 (1,46-13,36), *p* = 0,008) foram significativamente superiores.

**Conclusão:** Há uma elevada prevalência de tempo de ecrã excessivo em crianças em idade pré-escolar. O aumento do tempo de ecrã não afetou significativamente o crescimento e desenvolvimento. Houve uma maior ocorrência de birras, episódios de retenção de respiração, pesadelos, e hora de dormir para além das 22h00 horas em crianças com tempo de ecrã excessivo.

**Palavras-Chave:** Comportamento Problema; Comportamento Sedentário; Criança; Desenvolvimento Infantil; Índia; Inquéritos e Questionários; Pré-Escolar; Sono; Tempo de Ecrã