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ORIGINAL ARTICLE

A cross-sectional study on screen time profile in early childhood

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Abstract

Introduction: The presence of digital devices in children's daily lives has grown substantially. Early and excessive screen exposure may cause damage to neuropsychomotor development, making it essential to understand usage patterns to guide preventive interventions. **Methods:** Cross-sectional study, using convenience sampling, investigated multimedia device use among children aged 0 to 6 years. A total of 200 guardians were interviewed after written informed consent. The evaluation was carried out through the application of a previously tested questionnaire. Statistical analyses were performed in SPSS, using chi-square test for qualitative variables and Mann-Whitney test for quantitative variables, with significance set at $p < 0.05$. **Results:** The average age of children was 32.09 ± 22.32 months. All children were reported to have some screen exposure, with a mean daily usage of 128 minutes, exceeding pediatric recommendations. As for the parents, 59% lacked knowledge about screen-related risks, and only 18.5% reported receiving pediatric counseling on the subject. Screen time was significantly associated with age, with younger children using screens less frequently ($p < 0.01$). There is no significant correlation between socioeconomic status and pediatric orientation. **Conclusions:** There is a pattern of excessive screen use in early childhood. The study also demonstrates that pediatric guidance on the risks of screen exposure remains insufficient. These findings reinforces the need for pediatricians to actively counsel families, promoting conscious use of technology and preventing harm to the child development.

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INTRODUCTION

Currently, new media devices are being launched, and all age groups are targets of these technologies, including children[1]. In 2011, approximately half of U.S. children up to 8 years of age had a smartphone at home, and by 2017 this prevalence had increased to 95%[2,3]. Regarding screen time, a study of 119 Hispanic children with a mean age of 21 months found approximately 3.5 hours of screen time per day[4]. In Brazil, the numbers are also alarming: a study in Ceará including 3,155 children aged 0 to 60 months reported a daily screen exposure of 2.6 hours[5].

These figures are striking when compared with recommendations from pediatric references. According to the WHO, no passive screen time is recommended for children under 2 years of age; for children aged 2 to 4 years, screen time should not exceed 1 hour[6]. The Brazilian Society of Pediatrics (SBP) maintains the same recommendation[7].

These recommendations aim to reduce the potential risk of media exposure to child neuropsychomotor development, especially in early childhood, defined as the period between 0 and 6 years of age[8]. Early childhood, particularly the first three years, encompasses a crucial developmental phase, representing a window of opportunity for building capacities but also a period of vulnerability with lasting risks[8]. Children exposed to television programs may develop problems in overall development, challenging and aggressive behaviors, emotional reactivity[9], early sexuality, smoking, and mental health-related problems[10]. In addition, studies indicate impairments in language development, reduced social interaction with caregivers, decreased concentration, and difficulties in skill acquisition[4,11].

Therefore, despite these recommendations, the current scenario shows increasing media exposure in early childhood. Thus, this project aims to identify the profile of media use and classify the use of devices in two hospitals in the interior of the state of São Paulo. This mapping enables a better understanding of children's media use and supports the development of intervention strategies.

METHODOLOGY

This is an observational, analytical, cross-sectional study conducted to assess screen exposure time in children in early childhood. Data collection was carried out between August 2023 and June 2024 in two hospital units—specifically, inpatient wards—in X (SP). Selection of these units considered their regional relevance in pediatric care.

A total of 200 children aged 0 to 6 years, accompanied by their legal guardians, who were present in the hospital settings, were included. Participants were selected by convenience sampling according to their presence at the site during the data collection period. Inclusion criteria were: children aged 0 to 6 years (completed years), accompanied by guardians aged ≥18 years, who agreed to participate by signing the Informed Consent Form (ICF). Guardians who were not able to answer the questionnaire due to physical or mental health reasons, or who refused to participate, were excluded.

Sample size was calculated separately for each stratum, considering the annual number of visits: A (acronym, N = 558) and B (acronym, N = 442). The formula for estimating a mean with a finite population was used, where n is the sample size, Z is the value of the normal distribution for a 90% confidence level (Z = 1.645), CV is the coefficient of variation (CV = 0.5, estimated from literature data on screen time in children aged 0 to 6 years), N is the population size, and Erel is the desired relative margin of error.

The initial calculation indicated the need for 125 individuals for acronym A and 118 for acronym B to achieve a relative margin of error of 6.5%. However, for operational reasons, a total sample of 195 participants was adopted, with 100 from acronym A and 95 from acronym B. This allocation results in a relative margin of error of approximately 7.5% in each stratum, which was considered adequate for the study objectives and within the acceptable precision range for research on means of child behaviors[12].

Data were collected using a structured, previously pilot-tested questionnaire. The instrument addressed sociodemographic information (child's age, sex, family income, parents' education), behavioral factors (child's daily routine, presence of screens in the bedroom, supervision of device use), and aspects related to daily screen exposure time, type of device used, and accessed content.

Data analysis was performed using SPSS, with descriptive statistics (frequency, mean, median, and standard deviation) and inferential statistics using appropriate tests to assess associations between screen time and sociodemographic and behavioral variables. The chi-square test was used for qualitative variables, and the Mann–Whitney test for quantitative variables. The significance level was set at 5% ($p < 0.05$).

The study was approved by the Research Ethics Committee under opinion number 68699823.9.0000.5373 and followed all ethical principles established by Brazilian National Health Council Resolution No. 466/12.

RESULTS

Questionnaire: Parts I and II – Sample characterization

In this study, 200 interviews were conducted, and all administered questionnaires were included in the statistical analysis. The ages of the included children ranged from 2 to 82 months, with a mean age of 1 year and 9 months. The sample comprised 104 boys (52%) and 96 girls (48%); however, no differences between sexes were observed in the analyses. The respondents were predominantly mothers (86%), with a mean age of 30 years and 3 months. The overall description of the sample is shown in Table 1 below.

Questionnaire: Part III – Characterization of media device use

All children evaluated in this study use some type of media device daily. The most frequently used device was television (60%), followed by smartphones (38.5%). Only 1.5% of the children used tablets. Most children used these devices once a day (33.5%); however, 24.5% reported using them four or more times per day. Regarding daily screen time, 27.5% used screens for 30 minutes, 18.5% for one hour, 13.5% for two hours, and 18% for two hours or more, as shown in Chart 1 below. The mean daily use was 2 hours and 8 minutes.

It was also observed from the questionnaires that 33% of the children have a television in their bedroom, 31% of guardians allow device use during meals, and 10% of the children have a social media profile. In addition, 97% reported supervising the content the child watches, and 78.5% of the children prefer playing with toys and/or engaging in playful activities rather than watching television or using a smartphone. A significant correlation was observed between children's age and screen time, such that older age was associated with longer screen exposure ($p < 0.01$).

Questionnaire: Part IV – Guardians' knowledge about the risks of excessive screen use

The fourth part of the questionnaire assessed parents' and/or guardians' knowledge on the topic. Analysis of the responses showed that 59% of guardians reported having no knowledge about the topic, compared with only 41% of parents who had some information. When asked about parents' opinion regarding the quality of media content consumed by children, 66% of respondents believed that the content watched helps the child's development and education. In addition, 41% of participants stated that their own media use does not influence the children's media use.

Another questionnaire item addressed whether the pediatrician provided guidance about the risks of screen exposure during medical consultations. Responses indicated that 80.5% had not received information from the specialist, whereas 18.5% reported that the topic was addressed and 1% did not know, as shown in Chart 2 below. When asked about the appropriate age to begin accessing and using screens, approximately one quarter (23.5%) of respondents believed it is acceptable to introduce screens to children before two years of age. Finally, regarding the number of hours considered healthy per day, responses ranged from 1 to 5 hours daily, with a mean of 1.75 hours.

Table 1 – General description of the sample

Data	N = 200
Mean age of children	32.09 ± 22.32 months
Sex	Female: 96 (48%); Male: 104 (52%)
Relationship of guardians	Mother: 172 (86%); Grandmother: 9 (4.5%); Father: 13 (6.5%); Other: 6 (3%)
Mean age of guardians	30.32 years

Questionnaire: Part V – Socioeconomic characterization

The fifth part of the questionnaire assessed parents' socioeconomic class and how it influences variables such as parents' knowledge about the topic, screen time, access to screens, age at which children start using media, among others. To determine these relationships, the ABEP questionnaire[13] was used to assess the family's purchasing power, the education level of the head of household (the family member who contributes the highest income), and ownership of assets (such as cars, washing machines, refrigerators, and other goods).

Accordingly, 2% of respondents were classified as class A, 4% as class B1, 17.5% as class B2, 31.5% as class C1, 32% as class C2, and 12.5% as class DE, as illustrated in Chart 3 below. As the interviews were conducted in wards of public hospitals, it is evident that most respondents belonged to

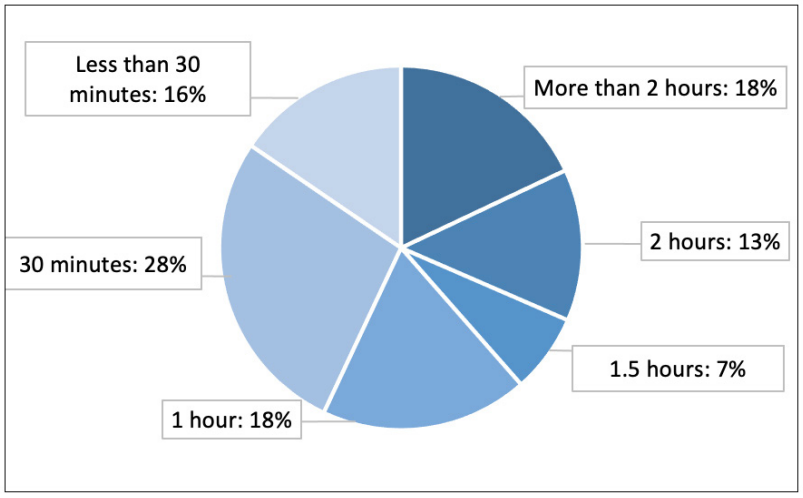


Chart 1: Daily screen time

more vulnerable classes or the so-called "middle class": class C—corresponding to 3 to 5 minimum wages.

When this classification was related to pediatric guidance, there was no correlation between socioeconomic class and pediatric counseling regarding screen use. Another frequently reported association that was not significant in this study was that the higher the family's social class, the greater the children's time using media devices. This relationship may not have been relevant in the present study because the data obtained reflect patients from hospitals whose populations are predominantly from more vulnerable classes or the so-called "middle class."

DISCUSSION

In the present study, all children aged 0 to 6 years used media devices, and the mean daily use exceeded that recommended by pediatric institutions, a finding commonly reported in the literature. Media device use among children has increased exponentially, especially after the pandemic period, during which screens became not only a source of entertainment but also of distance education and socialization[14]. A study involving 166 children identified a mean of one to two hours per day of device use[15]. The most commonly used media device was television; according to a Canadian study, excessive television use may lead to progressive interdependence of cortical structures, resulting in motor and cognitive difficulties in children—such as lower explosive strength and reduced attention and engagement in the classroom[16]—highlighting further consequences of excessive screen time for children.

Regarding children's daily habits, screens were present during meals and as part of the sleep routine. According to a U.S. study, children with habits such as eating with their families, adequate sleep (approximately 10 hours per night), and limited screen time have a 40% lower prevalence of obesity compared with children who do not practice these

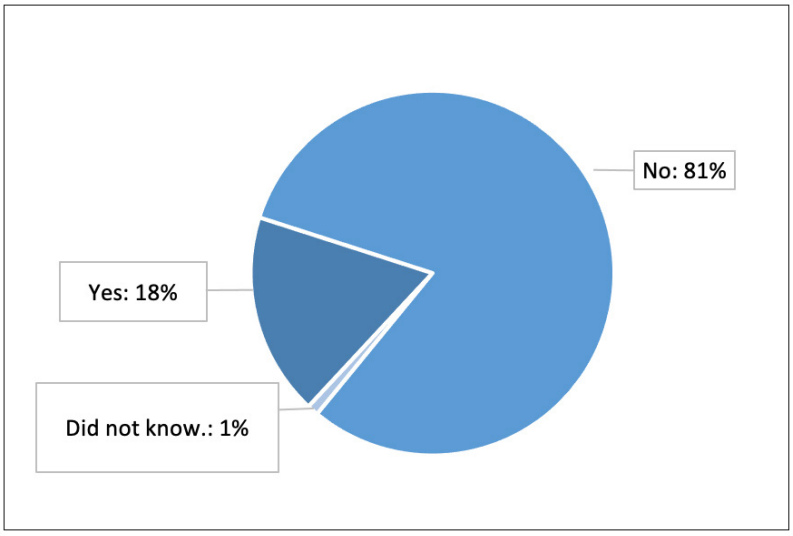


Chart 2: Did the pediatrician address the risks of screen use in childhood during the consultation?

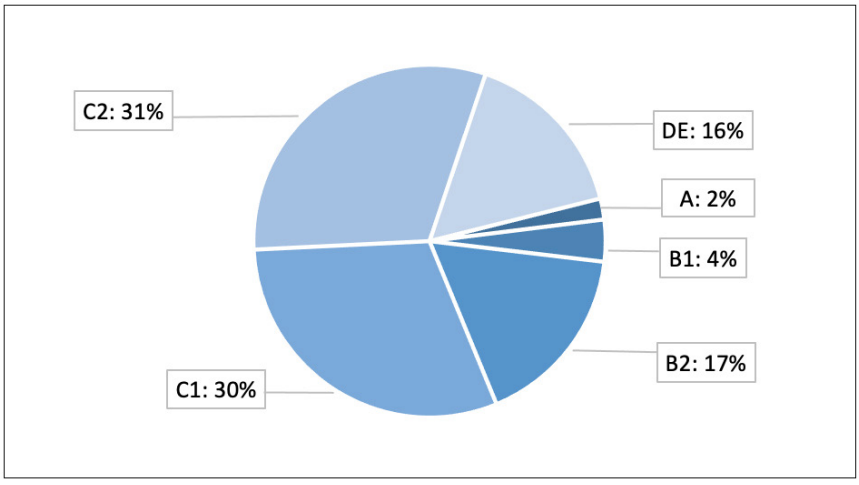


Chart 3: Respondents' socioeconomic classification

habits[17]. In addition, eating in front of the television increases consumption of sugar and ultra-processed foods in the pediatric population, as well as in adults[18].

With respect to guardians' supervision of the content watched, encouraging data were observed. However, it is important to emphasize that these data may be overestimated, since guardians may be reluctant to disclose excessive media use, which is a limitation of the present study. Still regarding device use, there was a significant relationship between children's age and screen time, such that older age was associated with greater exposure ($p < 0.01$). These data are consistent with the current literature, as the proportion of excessive screen time increases from 41.7% in children aged 0 to 12 months to 85.2% in children aged 49 to 60 months[5].

As for parents' knowledge on the topic, approximately 60% of respondents reported having no information about children's media device use. Although alarming, these findings still represent a more favorable scenario compared with another study in which approximately 90% of respondents had not had access to this information[19]. However, many parents who report knowing the limits for children's screen use may have inaccurate knowledge: a Portuguese study found that among guardians who stated they knew the recommendations, only 43% actually did[15].

Another finding is that most respondents in this study believe that the quality of the material consumed on screens is beneficial and supports child development. A similar finding was observed in a North American survey, in which two thirds of parents of children up to 2 years of age reported that screen use supports learning, and approximately half also believed that digital media use helps creativity, focus, and social skills[3]. In contrast, many studies assess the consequences of early and prolonged television exposure as being associated with aggressive behavior, hyperactivity, emotional hyperreactivity, inattention, and social problems[9].

Although recommendations for screen use are clear and specific, pediatricians do not appear to incorporate them into consultations. In the present study, 80% of respondents reported not having received information about media devices from the specialist. These data are consistent with other studies, which show shortcomings in pediatricians' role in addressing this problem[19].

In addition, questionnaire responses revealed that approximately one quarter of guardians consider it appropriate to introduce screens before two years of age, and the daily use considered adequate ranges from 1 to 5 hours per day. These values exceed the limit recommended by pediatricians—no screen use until two years of age, and for children aged 2 to 5 years, a maximum of 1 hour per day may be tolerated, always under supervision[7].

Finally, guardians' socioeconomic class, assessed using the ABEP questionnaire, was evaluated as a potential influence on other variables such as parents' knowledge on the topic, access to screens, and age of screen introduction. In this context, most respondents were classified as class C (Figure 4) and, as mentioned previously, a possible explanation for this finding is that the study was conducted in two public hospitals, whose populations predominantly comprise more vulnerable socioeconomic groups. This study context may also have influenced the lack of significance in the association between lower screen use in lower socioeconomic classes, a finding commonly reported in other studies[5]. In addition, there was no significant difference between socioeconomic classes and parents' knowledge on the topic.

An important limitation of this study is its cross-sectional design, which, although it allows identification of associations between variables at a specific point in time, does not allow establishing cause-and-effect relationships. Thus, it is not possible to state whether certain parental behaviors or sociodemographic characteristics cause greater screen time, or whether screen time influences these factors. In addition, data collection based on guardians' self-report may be subject to recall bias or social desirability bias, which may compromise the accuracy of the information provided. Another important limitation is that data collection occurred in only two hospital units, which prevents generalization of the results and reinforces the need to expand this study to include data from other locations and, therefore, be more representative of the general population. Nevertheless, this study contributes meaningfully to the recognition of screen-use patterns in early childhood, serving as a basis for educational actions and interventions aimed at health promotion.

This study demonstrated an excessive and early pattern of screen use in early childhood and limited knowledge among guardians on the topic. Lack of information regarding the number of hours, age at exposure onset, and the risks and consequences of this practice highlights a possible reason for excessive use of media devices among children in early childhood. In addition, our results reinforce the importance of the pediatrician's role as a key agent in guiding families, promoting conscious use of technology, and preventing possible harm to the child's physical, emotional, and cognitive well-being. Thus, the findings of this study may support both clinical practices and public policies aimed at promoting a healthier childhood.

DECLARATIONS

Ethical responsibility

This study was approved by the Research Ethics Committee of X – CAAE: 68699823.9.0000.5373.

Right to privacy and informed consent

The authors obtained informed consent from the patients and/or subjects mentioned in the article. This document is held by the authors.

Conflicts of interest

The authors declare that there are no conflicts of interest in this study.

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