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Problematic use of electronic devices and screen addiction in preschool children: a parent coaching program for prevention and treatment

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Research Article

Keywords: internet addiction, parent coaching, preschoolers, screen time, smartphone addiction

Posted Date: February 5th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8693325/v1

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Additional Declarations: No competing interests reported.

Version of Record: A version of this preprint was published at Child Psychiatry & Human Development on July 10th, 2026. See the published version at https://doi.org/10.1007/s10578-026-02052-0.

Abstract

Excessive and early exposure to electronic screen devices has been consistently associated with developmental, behavioral, and emotional problems in children, including the emergence of screen addiction. Preventive interventions involving parents are crucial, as screen habits in preschoolers are established by parents, tend to persist over time, and yield long-term negative consequences. This study evaluates the effectiveness of a parent coaching intervention in reducing children's daily exposure to electronic devices and screen addiction. One or both parents of 192 children (mean age: 3.1 years, range: 0.3–6.0) attended a 90-minute session, describing the consequences of excessive screen time in children, the behavioral hallmarks and neurobiological mechanisms of screen addiction, and practical strategies to overcome dependence, if present. The parents of 75 (39.1%) children also attended a second session one month later, to share their experience. The ScreenQ questionnaire was filled by parents before both sessions. At baseline, 148 (77.1%) preschoolers had already been exposed to portable electronic devices, with 71 (37.0%) starting before 18 months of age. Notably, 30/75 (40.0%) exhibited at least one indicator of problematic screen use, specifically irritability upon device withdrawal, and 7/75 (9.3%) met all criteria for screen addiction. After the intervention, ScreenQ total scores significantly decreased in the Access and Interactivity domains, reflecting reduced daily screen time and unsupervised use, with increased parental engagement during media exposure. Our findings highlight the need to address emerging digital dependence early in preschoolers and support the efficacy of parent-directed interventions to contrast excessive screen exposure in young children.

Introduction

Screen devices, including televisions, computers, and mobile devices like smartphones and tablets, have become ubiquitous in modern households, and children are being increasingly exposed to these devices at an early age. In recognition of this trend, the American Academy of Pediatrics (AAP) released a Policy Statement with recommendations on the use of digital devices in young children [1]. The AAP discourages the exposure to digital media of children younger than 18–24 months, while recommends limiting it to 1 hour per day between the ages of 18–24 months and 5 years. On 2019, the World Health Organization (WHO) released similar guidelines [2]. Despite these warnings, evidence indicates that to date only about one third of children under 5 years of age meets screen time guidelines [3]. According to a recent survey [4], in the U.S. children under 2-year of age spend approximately 1 hour on screen media, children 2–4-year-old approximately 2 hours, and children 5–8-year-old up to 3 hours daily. Furthermore, about half of the children aged 0–8 years possess their own device, especially tablets [4].

A growing body of evidence indicates that excessive daily screen exposure is linked to several developmental and health risks, including language and cognitive delays [5–11], behavioral problems [5, 12, 13], attention deficit [14–16], executive dysfunction [17, 18], sleep disorders [19, 20], hypertension and obesity [21]. Excessive screen time may also hinder psychosocial development, as children tend to engage with digital devices at the expense of more age-appropriate activities, including peer play [22]. Converging evidence supports the negative impact of excessive screen time on the development of the

neural circuits underlying language processing. Hutton and Colleagues [10] showed that excessive screen time in children aged 0–3 years interferes with the development of verbal language and emergent literacy skills, delaying the myelination of neural circuits underlying linguistic abilities. Language acquisition is fostered primarily through adult-child interactions, which are absent when children passively consume video content. Nevertheless, several studies highlight that certain factors, such as high-quality media content and parental co-viewing, may mitigate this negative association [23, 24]. Co-viewing, in particular, can provide caregivers with opportunities to promote learning through joint engagement with the child [23–25]. At the same time, excessive screen use by both children and parents can interfere with adult-child interactions: this phenomenon, referred to as "technoference"[26], negatively impacts the quality of parent-child relationship and, consequently, child development [26–30]. Caregivers, particularly those with over-reactive or over-permissive parenting styles, may resort to portable screen devices as a soothing tool, for example during mealtime, at bedtime, to fill in empty hours, or to calm children when upset, especially in those who display higher negative emotionality or limited self-regulation [31–33]. However, this practice may hinder the development of children's self-regulatory skills, reinforcing a vicious cycle that ultimately makes problematic behaviors more difficult to manage over time [34]. These negative outcomes have been documented in all age groups, but effects appear to be particularly detrimental and long-lasting when excessive screen exposure occurs during preschool years, a critical period for the development of many neural circuits [13]. Furthermore, longitudinal studies suggest that the association between negative effects and screen exposure is not bidirectional, i.e. excessive screen exposure leads to adverse outcomes rather than the opposite [8, 11, 31].

Excessive screen exposure may actually represent the expression of an addictive behavior. Digital products are specifically designed with appealing features to capture and retain users' attention, relying on behavioral reinforcement mechanisms that make disengagement difficult, especially for young children whose impulse control is still underdeveloped [34]. Children 6–11 years old engaging with electronic devices for more than 2 hours daily show increased internet addiction behaviors, compared with peers engaged for a shorter time [35]. Also in preschoolers, smartphone use, when exceeding 2 hours per day, easily becomes "problematic smartphone use" (PSU) [36]. Interestingly, children with PSU used smartphones more frequently but for shorter periods compared to those without PSU, suggesting a heightened compulsive urge to engage with the device, that is rapidly yet temporarily satisfied [36]. These results are consistent with several imaging studies demonstrating that screen devices, and especially smartphones, foster addictive behaviors, triggering and promoting their own compulsive use. In particular, certain forms of screen-related addiction, especially gaming and internet addiction, are associated with increased dopamine release in the ventral striatum, a key structure within the brain's reward circuitry [37, 38]. A systematic review of neuroimaging studies provided compelling evidence for shared neural mechanisms between substance-related addictions and internet and gaming addiction, particularly within brain regions involved in reward processing, craving and emotional regulation [39]. Young individuals with smartphone addiction exhibit brain activation patterns during cue-reactivity tasks involving smartphone-related versus neutral stimuli that closely resemble those observed in other

addictive disorders [40]. Similarly, another study [41] reported alterations in the microstructural properties of white matter in brain regions implicated in cognitive functioning and emotion regulation among young adults with smartphone addiction—changes that parallel those found in individuals with substance-related addictions. Consistent with these neurobiological findings, a systematic review and meta-analysis found that approximately one in four children and adolescents present PSU, and that this is significantly associated with several mental health issues, such as depression, anxiety, insomnia, heightened stress, and poor academic performance [42].

Several intervention studies aimed at reducing screen time exposure in children and adolescents have been published to date, with some reporting positive outcomes [43–45]. However, very few intervention/prevention programs have specifically targeted preschool-age children. In two studies conducted in pediatric clinic settings [46, 47], parents received brief 10-minute counselling sessions on the adverse effects of screen exposure (a single session in [47], and three sessions in [46]) with only the latter study reporting a significant reduction in children screen time [46]. Another study [48] implemented a preschool-based intervention as part of a health promotion program, where children were encouraged to turn off the television and were actively involved in identifying alternative activities. This approach also proved effective in reducing television viewing.

Given the evidence that screen time habits established in early childhood tend to persist later in life and to exert long-term detrimental effects on neurodevelopment, preventive interventions during the preschool years may offer the greatest benefits [31]. Moreover, access of preschool-age children to electronic devices and daily screen time exposure are decided by their parents. As parenting styles influence caregivers' decisions regarding children's screen exposure, the implementation of effective parent-coaching programs to guide healthy media use is essential.

Aims of the study

The aims of this study were:

(1) to collect information on electronic device exposure and screen addiction from parents of children aged 0–6 years;

(2) to assess the effectiveness of a parent-directed intervention in reducing the indiscriminate exposure of preschoolers to electronic devices, especially smartphones, by

1. (a) increasing parental awareness of their potential negative effects on child neurodevelopment and behavior;
2. (b) providing simple criteria to recognize whether their child was at risk or had already developed an addiction to an electronic device; and
3. (c) offering simple, straightforward and practical strategies to appropriately manage screen addiction in the child.

In addition, parental compliance and satisfaction with the program were measured by (a) the proportion of parents attending the second session one month after the first session, and (b) parental perceived benefit of the intervention, measured through an *ad hoc* questionnaire.

Methods

Participants

This study presents the first set of results obtained by the “Smartkids project”, a collaboration between the Modena Public Education Service 0–6 and MeMo Center, Fondazione Cresci@Mo, and the University of Modena and Reggio Emilia. All parents of children aged 0–6 years enrolled in public nursery schools, kindergartens, or preschools in the city of Modena (Italy) were eligible to freely participate in this study. No exclusion criteria were applied, other than the child’s age and enrollment in the pre-school public education system. The study was approved on December 14, 2023 by the Ethical Committee of Area Vasta Emilia Nord (prot. n. 36275/23). All parents provided written informed consent for themselves and for their child. The data reported in this study refer to 192 children, whose parents were enrolled between January 2024 and March 2025.

Intervention

Parents were asked to participate to two meetings of 90 minutes each, conducted one month apart. The first meeting consisted in a parent-coaching session held by one pf the authors (A.M.P., L.A.), addressing:

1. a) a review of recent evidence on the negative effects of prolonged screen time during early childhood on neuropsychological development;
2. b) causes and manifestations of addiction induced in young children by electronic devices, especially smartphones and tablets. Drawing on DSM-5 criteria for Substance-Related and Addictive Disorders [49], screen addiction in this age range was defined by the presence of the three following features:

1) compulsivity: the child compulsively seeks electronic devices, even when engaged in other enjoyable activities;

2) loss of control: the child does not stop using the electronic device, unless interrupted;

3) irritability or dysphoric mood upon withdrawal: the child becomes highly irritable when interrupted while using the electronic device or when access to it is denied, with emotional intensity and anger far beyond typical complains.

c) a set of simple, practical strategies to help parents prevent screen addiction or remove it, if already present.

Specifically, caregivers and other family members living in the household were encouraged to completely abstain from using digital devices in their child's presence for a period of two weeks, explaining to the child that the devices were unavailable because broken and temporarily under repair. Parents were informed that this approach might initially elicit increased irritability and oppositional behaviors lasting a few days. To minimize this inconvenience, they were advised to consistently provide alternative, funny, highly personalized and non-screen-based activities that could capture the child's interest and sustain neural activity in the reward circuits during the withdrawal period. This approach was conceived by one of the Authors (A.M.P.) with expertise in addictions and in child psychiatry, and were found clinically effective on smartphone addiction within approximately 7–12 days, even in preschoolers with severe neurodevelopmental disorders.

Parents were asked not to intervene immediately, but rather to spend at least one week observing their child's behaviors and reactions when engaged with electronic devices, paying particular attention to the three potential signs of internet addiction described above. Parents were also asked to self-monitor their own use of smartphones, especially during daily family life. After this initial observation, parents could decide whether and to what extent it may be necessary for them to promote changes in their management of electronic devices with their child by applying the strategies presented during the first session, and then to share their experience during the second session, held approximately one month later. This second session took the form of a circle-time group meeting, coordinated by the same expert leading the first session (A.M.P., L.A.).

Procedure

Prior to the start of each session, parents were asked to complete the ScreenQ questionnaire [50], a standardized and easy-to-administer tool that provides a quantitative score of children's overall exposure to video devices. The ScreenQ consists of 15 items and gathers information across four domains derived from the AAP recommendations: access to screens, frequency of use, media content, and co-viewing with an adult. For this study, an Italian translation of the original ScreenQ questionnaire was used, specifically explaining that the term "screen media" or "video devices" encompasses smartphone, tablet, computer, playstation and television, and containing four additional specifiers not present in the original version of ScreenQ, added to items 2 and 8 to collect more information specifically on which device was used by the child, and to items 3 and 7 to collect more details about the frequency of use. Finally, the ScreenQ questionnaire administered before the second session contained one additional item, asking parents whether during the month between the two sessions they had observed compulsivity, loss of control, and/or irritability upon withdrawal in their children (i.e. the three behavioral signs of internet dependence described above). The Italian translation has not been formally validated, but was prepared by one of the Authors (A.M.P.) and approved by a bilingual native English speaker working as a professional translator. The original English version and the Italian translation of the ScreenQ questionnaire are provided as Supplementary Files 1 and 2, respectively. Finally, at the end of the second session parents were asked to answer five questions on a 5-point Likert scale to assess how

useful they found their participation in this project (Supplementary File 3). This participant satisfaction questionnaire was introduced starting with the second year of the “Smartkids Project”, and data have been thus collected from the parents of 49 children (Suppl. Table S1).

Statistical analyses

Numerical variables are presented as mean ± standard deviation (S.D.). Categorical variables are presented as frequencies and percentages. Shapiro-Wilk test showed that data were not normally distributed, thus paired-sample Wilcoxon Test was performed to assess differences in ScreenQ scores before and after intervention. Data from the original ScreenQ questionnaire are always reported; whenever results obtained from the additional specifiers and item present in our Italian translation are presented, this is explicitly stated. Analyses were performed using R, version 4.5.0 (R Core Team, 2025).

Results

Participants

The parents of 192 children (mean age = 3.1 years, range = 0.3–6.0; 108 M: 84 F) were enrolled in the study after written parental informed consent was obtained and the ScreenQ was completed before the first session. In the majority of cases, the parent attending the first session was the mother (n = 151, 78.7%), followed by the father (n = 31, 16.1%), while both parents attended in 10 cases (5.2%). The second session was attended by parents of 75 (39.1%) children.

Screen time habits

At baseline, parents reported that the majority of children in our sample (n = 148; 77.1%) had already been exposed to portable digital devices, most frequently smartphones (n = 135; 70.3%). Early exposure was common: 71 children (37.0%) were introduced to screen devices before 18 months of age, including 21 (10.9%) who were exposed before their first year of age. Importantly, parents of 73 children (38.0%) reported daily screen time exceeding one hour; however, only 3 (1.5%) were reported to use smartphones for more than one hour per day. Caregivers reported interacting with their children during and after video viewing in 173 (90.1%) and 165 (85.9%) cases, respectively, although parental engagement was short-lasting and inconsistent in the majority of cases. Notably, 32 (16.7%) children watched videos and 12 (6.3%) used applications on smartphones or tablets without any adult supervision. Parents of 45 (23.4%) children affirmed using electronic devices to calm down their child when upset, 44 (22.9%) during meals and in 32 (16.7%) cases electronic devices, especially television, were employed at bedtime to facilitate sleep.

ScreenQ scores

Table 1 and Fig. 1 summarize ScreenQ domains scores before and after the intervention, respectively, as reported by the parents of 75 children who participated in both sessions. Highly significant improvement was found in the domains of Access and Interactivity, as well as in the Total Score, indicating reduced access to electronic devices and increased interactions with the caregivers during vision. Table 2 details differences at single ScreenQ items. After the intervention, children were significantly less exposed both to smartphones (item 2, $p = 0.003$) and to screens altogether (item 7a, $p = 0.002$), especially when outside of the house (item 5, $p = 0.04$). Children were also less frequently allowed to independently select videos or download apps (item 11, $p = 0.04$), and parents more likely to discuss with their children about the content of the video or game previously played (item 15, p = 0.025). A reduction in unsupervised app use was also observed at item 13b, although it did not reach significance (p = 0.07) (Table 2). Finally, an important change was picked by our specifier at item n. 3 and missed by the original item n.3. In fact, the number of children exposed during meals (original item 3: yes = 1, no = 0) was not significantly reduced (p = 0.145), but the frequency of smartphone exposure during mealtime (item 3 specifier: rarely = 0, often = 1, always = 2) indeed showed a significant decrease in frequency (p = 0.049) (Table 2).

Table 1
ScreenQ domains before and after the intervention (T1 = before the first session and T2 = at the second session). *N*, mean score and paired sample Wilcoxon test statistics are reported. Statistically significant results are highlighted in bold.

	T1		**T2**		
ScreenQ domain	***N***	**Mean**	***N***	**Mean**	***Paired Wilcoxon Test Statistics***
Access	75	2.69	75	0.79	V = 2048.5, **p = 4.855e-12**
Frequency	75	1.35	75	1.25	V = 464, p = 0.4359
Content	74	0.49	74	0.45	V = 143, p = 0.5731
Interactivity	75	1.51	75	1.12	V = 541.5; **p = 0.003179**
Total	75	5.95	75	3.6	V = 1943.5, **p = 1.233e-10**

Table 2
ScreenQ item scores before and after the intervention (T1 = questionnaire filled before the first session, T2 = questionnaire filled during the second session). *N*, mean score and paired sample Wilcoxon test statistics are reported. Nominally significant results are highlighted in bold.

	T1		**T2**		
	N	**Mean**	**N**	**Mean**	***Paired Wilcoxon Test Statistics***
Item_1	74	0.189	75	0.187	V = 1, p = 1
Item_2	75	1.60	75	1.351	**V = 140, p = 0.04117**
Item_3_original	75	0.173	75	0.108	V = 48, p = 0.145
Item_3_specifier	75	0.227	75	0.107	**V = 71.5, p = 0.04982**
Item_4	75	0.493	75	0.467	V = 76.5, p = 0.6379
Item_5	75	0.240	74	0.137	**V = 31.5, p = 0.04108**
Item_6	66	0.530	70	0.614	V = 37.5, p = 0.3014
Item_7_original	72	0.472	74	0.338	**V = 55, p = 0.001904**
Item_7_specifier	68	0.015	66	0.015	V = 1.5, p = 1
Item_8	74	0.230	75	0.187	V = 28.5, p = 0.4922
Item_9	74	0.203	75	0.160	V = 80, p = 0.5095
Item_10	73	0.096	74	0.081	V = 22.5, p = 0.5297
Item_11	73	0.315	75	0.227	**V = 32, p = 0.04183**
Item_12	69	0.087	72	0.153	V = 8, p = 0.2986
Item_13a	71	0.183	74	0.176	V = 36, p = 0.8016
Item_13b	58	0.12	57	0.035	V = 10, p = 0.07186
Item_14	71	0.606	72	0.500	V = 123.5, p = 0.06277
Item_15	71	0.620	72	0.444	**V = 189.5, p = 0.02545**

Screen addiction

Parents attending the second session reported observing unusually intense irritability when use of the electronic device was interrupted or access was denied in more than one third of the children (30/75, 40.0%) (Table 3A). Notably, irritability was present in all children who exhibited at least one sign of screen addiction and was always perceived by parents as different in intensity, duration, and emotional quality from the typical tantrums of their child. The electronic device responsible for precipitating intense irritability upon withdrawal was television in 21 children, smartphone in 18 cases and tablet in 4 children.

Compulsive seeking of screen devices was observed in 13 children (17.3%), while loss of control during use was reported in 10 (13.3%) (Table 3A). Overall, 30 children (40.0%) displayed at least one indicator of screen addiction, with 9 (12.0%) children displaying two indicators and 7 (9.3%) meeting all three criteria (Table 3B). Interestingly, 6 of these 7 preschoolers were reported to be dependent on both smartphone and television, with YouTube videos on smartphones and handling of the remote control of televisions particularly attractive.

Table 3
Number and percentages of children showing compulsive use of electronic devices, loss of control and irritability when using screens.

A		
Signs of screen addiction	**N**	**%**
Irritability following interruption of device use or access denial	30	40.0%
Compulsive seeking of the electronic device	13	17.3%
Loss of control while using the electronic device	10	13.3%
B		
Number of screen addiction	**N**	**%**
0/3	45	60.0%
1/3 - irritability only	14	18.7%
2/3 - irritability + compulsive seeking or loss of control	9	12.0%
3/3 - irritability + compulsive seeking + loss of control	7	9.3%

Discussion

The present study explored screen use habits in preschoolers and evaluated the short-term efficacy of a parent coaching intervention aimed at: (a) preventing problematic use of electronic devices by raising parental awareness about the risks of excessive screen use, including its neurodevelopmental consequences and potential for addiction; (b) providing parents with simple and easy-to-apply criteria to define whether and to what extent exposure to electronic devices had produced dependence in their child; and (c) supporting parents in managing problematic use and screen dependence, when already established.

More than one third of children in our sample had been introduced to digital media before 18 months of age, and a substantial proportion exceeded the one-hour daily limit recommended by pediatric guidelines. These findings align with prior research documenting widespread and early screen exposure among preschoolers. Although we did not systematically collect information on the type of activities

performed with digital devices or on the nature of the content accessed, these topics were extensively discussed during the second meeting. Parents reported that the most frequent activity was watching short cartoons considered age-appropriate and educational, both on smartphones and on TV. Most caregivers reported interacting with their children during (173/192, 90.1%) and after (165/192, 85.9%) media use. However, co-viewing was neither long-lasting nor consistent, and a considerable proportion of children were often left unsupervised while using electronic devices. In these instances, young children were often found compulsively scrolling the smartphone for images and videos typically on YouTube. These findings underscore the need for interventions aimed not only at reducing daily total screen time, but also at strengthening parental awareness of the protective role of active co-viewing, which has been shown to mitigate the negative consequences of early screen exposure [23]. In this regard, our intervention proved effective: following the first informative session, parents engaged more frequently with their child after video viewing, while children were less frequently allowed to use applications without adult supervision.

The use of electronic devices as a soothing tool against tantrums, at bedtime, or during meals, was initially reported by parents of 45 (23.4%), 44 (22.9%), and 32 (16.7%) children, respectively. Given the documented association with emotional dysregulation [12, 51] and sleep disturbances [52], this finding raises concern. Our intervention produced a significant reduction in smartphone exposure during meals (Table 2, item 3-specifier), whereas use to calm the child or at bedtime did not decrease significantly (Table 2, items 8 and 9 respectively). Furthermore, during the discussion held in the second meeting, parents often claimed resorting to screen media to keep children occupied, for example at home when cooking dinner or when dealing with younger siblings. It is important to support parents in finding enjoyable alternatives to electronic devices, when they need to keep their child engaged without direct supervision.

Overall, the “Smartkids program” effectively reduced children’s overall screen exposure, at least short-term. The observed reduction in ScreenQ total scores was primarily driven by significant changes in the Access and Interactivity domains (Table 1, Fig. 1), suggesting that the intervention successfully decreased total daily screen exposure, limited use outside the home, and promoted greater caregiver-child engagement during media use. Non-significant reductions were instead observed in the Frequency and Content domains (Table 1 and Fig. 1). The Frequency domain includes items related to the age of first screen exposure and the use of screens for soothing or at bedtime, while the Content domain assessed exposure to violent or fast-paced media and children’s autonomy in selecting programs or apps. Given the very young age of our sample, it is not surprising that parents were already avoiding inappropriate content. Stronger effects on these domains may be expected in older children, although parents of preschoolers are not always aware of what their children view, since parental supervision is not constant and 12 (6.3%) children were admittedly on electronic devices entirely unsupervised.

Full screen addiction was identified in 7 (9.3%) children, a remarkable proportion given the young age of participants (Table 3A). However, 30/75 (40.0%) children exhibited one sign of screen addiction always in the form of withdrawal dysphoria, i.e. acute irritability when use of the electronic device is interrupted

or access denied (Table 3A). The negative affect of these emotional tantrums, likely produced by a sustained and prolonged activation of the extended amygdala [40], was defined by parents as “more profound” (i.e., of greater intensity and duration) compared to the typical outbursts of their child. Importantly, compulsive seeking and loss of control over device use were always observed in children who also displayed irritability when device use was interrupted or access denied (Table 3B), suggesting that the onset of withdrawal irritability alone may represent an early marker of emerging dependence on screen devices. In line with the neurobiology of addictive stimuli, parents reported that this irritability emerged already after few exposures to the device, especially with smartphones.

We anticipated greater addictive potential for smartphones over other electronic devices, due to their portability, interactivity, and faster response. However, signs of full-blown screen addiction were observed most frequently in children misusing *both* to smartphone and television. This may reflect the young age of our cohort, in which independent access to the smartphone is typically mediated by parents, whereas television remains more easily available. Nonetheless, it is important to consider that television remains a salient medium for young children.

Limitations

This study has several limitations. No demographic information was collected except for age and sex, limiting our ability to account for sociodemographic confounds. We did not collect information on indirect screen exposure, such as background television, which has been shown to exert detrimental effects on child development. The activity or content most frequently consumed by children was discussed with parents during the second meeting, but not systematically assessed. The ScreenQ is a parent-reported measure which may suffer from response distortion due to social desirability and underestimate children’s actual screen exposure.

The substantial participation rate at the first “educational” session reflects parental concern about managing screen use in their children, but only the parents of 75/192 (39.1%) children also attended the second “discussion” session. This substantial decrease may not necessarily reflect lack of interest or impact. Indeed, feedback obtained from a subgroup of 49/75 (65.3%) parents who completed both sessions was largely positive (see Suppl. Table S1). Furthermore, anecdotal reports by some teachers suggest that many families, especially those with very young children, may have found the information provided in the first session already sufficient to address their needs. Nonetheless, future editions of this program will implement the satisfaction questionnaire also after the first session, to better capture parental perceptions.

Conclusions

Overall, our current findings are consistent with the emerging literature reporting frequent problematic media use in children and emphasizing the importance of early prevention, identification, and management strategies. A brief and structured educational intervention based on parent coaching here

improved parental practices related to media use, likely translating into a healthier life style within the family. Importantly, our intervention provided not only information on the negative consequences of excessive screen exposure in young children, but also simple and effective empowerment strategies to promote addiction recognition and management by parents. Furthermore, the possibility to attend the second session after one month, made parents in need of additional help feel accompanied in their efforts.

This study should be viewed as “work-in-progress”, since our “Smartkids project” in the Modena school system will continue in the years to come. The collection of larger samples of preschoolers, assessments of long-term outcome, and the design of programs tailored for older children and adolescents represent promising avenues of future investigation.

Declarations

Ethics approval.

The study was approved by the Ethics Committee of Area Vasta Emilia Nord (protocol no. 36275/23, 14/12/2023).

Consent to participate.

All participants in this study provided written informed consent in accordance with the procedures approved by the ethics committee.

Competing interests.

The authors declare no competing interests.

Funding.

This study was funded the University of Modena and Reggio Emilia under grant scheme for the promotion of Public Engagement activities (“Bando per l’agevolazione di attività di Public Engagement”), for the years 2022, 2023, and 2025.

Author Contribution

L.A. was involved in participant recruitment, data collection, database preparation, data analysis, results tabulation, and drafting of the manuscript. L.S. was involved in database preparation and reviewing of the manuscript. A.M.P. was involved in the conceptualization of the study, study design, participant recruitment, data interpretation, and reviewing of the manuscript. All authors read and approved the final version of this manuscript.

Acknowledgement

The authors gratefully acknowledge Silvia Cestarollo, Simona Cristoni, Giuliano Boni, Paola Francia, Patrizia Guerra (Modena Public Education Service 0-6 and MeMo Center), and Emanuela Ricci (Fondazione Cresci@Mo) for their collaboration, and Modena City Councelors Grazia Baracchi and Federica Venturelli for their continued support to the “Smartkids” project.

Data Availability

Data are available from the authors upon reasonable request - subject to ethical permissions and participant consent.

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Figures

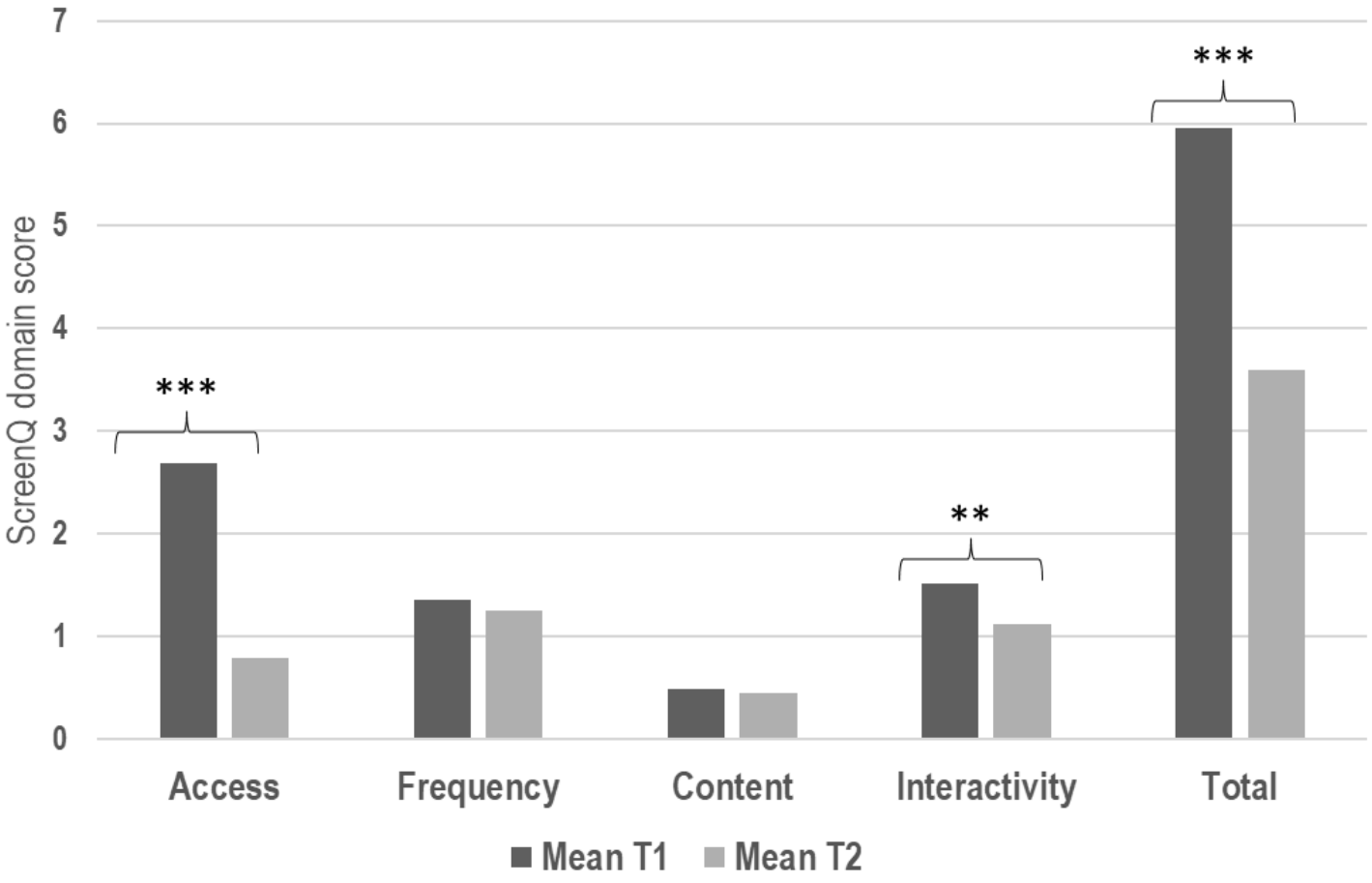


Figure 1

Mean ScreenQ domain scores before and after the intervention (T1= questionnaire filled before the first session, T2=questionnaire filled during the second session).
**$p < 0.01$; *** $p < 0.001$

Supplementary Files

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- 2aSmartkidsSupplFile1ScreenQEnglishoriginal130126.pdf
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