

Screen use among toddlers and preschool children

Sandra V. García^a , Tatiana Dias de Carvalho^a 

ABSTRACT

It is common to see young children playing with a mobile phone or a tablet. However, the decision about the availability of an electronic device and how and when to use it depends on adults. The concern is the increase of such practice at the expense of activities and social interaction by talking and being in contact with others, as well as other aspects of children's health (overweight and sleep disturbances). It is yet unclear how the generalized use of screens affects development. The physical and psychological mechanisms of such effects are also unknown. The purpose of this article is to provide a current view of the effect of early exposure to screens on the comprehensive development of children and parents' perceptions. It would be conducive to implement education projects for parents and legal guardians that promote an adequate child stimulation at home.

Key words: *sedentary behavior, child development, public health, technology, screen time.*

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INTRODUCTION

It is common to see young children, even infants, watching YouTube[®] videos while playing with a mobile phone or tablet. Next to them, you find adults watching another screen or celebrating that these children are smart enough to use them, unaware of or overlooking the effects of exposure to this type of technology at an early age.

These children are known as “digital natives”.¹ They are surrounded by electronic devices and their environment introduces screen culture at earlier ages. In this article, screen is defined as any electronic

device that projects images:² TVs, mobile phones, tablets, etc.

However, the decision about whether a child has an electronic device and how and when to use it depends on adults. It may depend on parents' beliefs about the effects of these devices, family factors that may facilitate or hurdle their use, and/or the rules set by adults.

During human development, the first years of life are characterized by great neuroplasticity. During this period, every experience (internal and external) has a major impact on social, cognitive, and emotional development and motor aspects.³ Given exposure to screens from an early age, the concern is the increase of such practice at the expense of physical activity (sedentary lifestyle) and social interaction by talking and being in contact with others, as well as other aspects of children's health (overweight and sleep disturbances).

From a different perspective, there is tension between information and communication technology consumption processes (media consumption: television and other audiovisual means) and the development of affection between children and their families, i.e., consumption versus socialization.

Routines for future life are established during early childhood; parents play an important role in habits related to media. An intensive screen use by parents and legal guardians is associated with a lower level of interaction with children. This may be considered a predictor of

a. Universidad Nacional de La Matanza, Department of Health Sciences, Bachelor's Degree in Kinesiology and Physical Therapy, San Justo, Argentina.

E-mail address:
Sandra V. García:
tosan14.sg@gmail.com

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media consumption habits and of consequences on child development.^{4,5}

In these situations, and given health care providers' concerns regarding the lack of clarity about the advantages, consequences or effects that such early contact with electronic devices may have, it would be convenient to inquire about screen use in infants, toddlers, and preschool children and the effects it may present on their physical, social, emotional, biological, and cultural features. Although there are studies about this topic, they were conducted in industrialized countries, and investigations with a similar approach to this age group in Argentina or Latin America are rare. Therefore, it has become a very important field of research that, given the growing concern worldwide in terms of public health interventions, assists with the follow-up of children by an interdisciplinary team to favor their comprehensive development.

STATE OF THE ART

This section includes, first of all, a brief overview of the characteristics of child development, with emphasis on the relevance of physical activity and relationships in order to understand, secondly, the negative and positive effects of electronic screen use—what is right and wrong. Lastly, we have analyzed parents' perceptions and the significance of such technology in the tension between consumption and socialization.

Child development

Child development is a complex process that entails the combination and interaction among biological, environmental, historical, and social factors.⁶ During the first 1000 days of life, neuroplasticity strengthens and has a positive influence on brain development.⁷ Early age is one of the most important periods for the development of motor, social, and cognitive skills. From a social and cognitive standpoint, it is worth noting that the first socialization process takes place during early childhood: children assimilate cultural codes in their interrelationship with society. They learn to speak without anyone teaching them how to combine words and build phrases, by watching, observing, and analyzing the context in their environment; i.e., they go

through deuterio-learning processes (they learn codes, relationships between words, and grammar rules on their own): gestural, emotional, temporal, and spatial codes, tastes, rhythm, beat, and intonation.⁸ To incorporate such codes, children need to be able to communicate with others effectively. In this regard, child development takes on a social nature because the development of a child's psychological and emotional skills will depend on the encounter with other individuals and culture.⁹

Based on neurodevelopment, Bobath¹⁰ considers that a child's normal physical, mental, emotional, and social development depends on their ability to move around. In the womb, fetuses move their limbs pushing on the tummy walls or their own body and, in turn, they receive tactile and proprioceptive feedback. This way, they start developing their body perception, which continues after birth. It is true that motor development has an impact on every aspect of child behavior. Actually, since birth until language acquisition, children go through a period of major mental development, which is conquered by movements and perceptions, what Piaget¹¹ called sensorimotor assimilation of the outside world, a period that lasts until 18 months or 2 years old. During this period, exploration with their hands and movement are necessary, together with social interaction with adult models, to develop their cognitive, language, motor, social, and emotional skills. Due to the immaturity of symbolic thought and attentional skills, infants and toddlers cannot learn about traditional digital media as they do from interactions with their caregivers, and they present difficulties translating such 2-dimensional knowledge (screen) into their actual, 3-dimensional life experience.^{3,12}

According to physical development, the World Health Organization (WHO)¹³ reports that physical activity in children under 5 years of age is favorably associated with bone and skeletal health and the development of cognitive and motor skills, in addition to improving cardiometabolic health. It is acknowledged that an excessive sedentary behavior may be detrimental to health. In addition, it is worth mentioning that early movement quality or accuracy are important because they serve as

the basis for future movements.¹⁴ Christine Tardieu¹⁵ also mentions that while toddlers learn to stand up and walk, their skeleton straightens gradually and changes notably. Therefore, an upright posture and gait guide osteoarticular development. Although genetic baggage is present, skeletal development is also influenced by nutritional intake and functional impact, i.e., the history of skeletal use.

Accordingly, any limitation in children's ability to move actively or explore their body and their surroundings may cause a delay in the deployment of their perceptive skills and interfere with the development of language and thought. From this perspective, the influence of stimulation provided by parents and guardians at home is very relevant. Motor skills are favored by a higher mother and child interaction, with sufficient space to move freely and age-appropriate toys. Likewise, environmental stimuli, or a lack thereof, are determinants in brain development from an early age.¹⁶

On what is right and wrong

It is yet unclear how the generalized use of screens affects development.^{3,17} The psychological and physical mechanisms that may cause such effects are also not known for sure.¹⁷ In spite of this, studies based on populations of toddlers and preschool children have shown associations between excessive screen time and delays in cognitive, linguistic, psychological, and social skills, in addition to an increase in behavioral problems.¹⁸⁻²¹ On the other side, it has been demonstrated that playing with traditional toys is associated with the acquisition of a higher number of words and a better quality of language compared to screen use. In addition, role-playing promotes self-regulation because, by pretending, adjusting to roles, and helping in an imaginary context, children improve their ability to reason in hypothetical situations.²²

Moreover, an intensive screen use during this stage of life is associated with small but significant increases in body mass index (BMI), which may account for the risk of obesity among children and set the basis for overweight later in childhood.^{12,19}

In relation to sleep, longer exposure and/or the presence of a TV, computer, or mobile device in

the bedroom in the first years of childhood have been associated with fewer minutes of sleep per night. Even babies exposed to digital screens in the afternoon have shown a significantly shorter nighttime sleep than those without exposure during the afternoon.^{3,12,20} Exposure to light (especially blue light) and screen activities before bedtime affect melatonin levels and may delay or alter sleep; in addition, said exposure may affect academic performance and behavior. A study in preschoolers confirmed that outdoor play is associated with fewer nocturnal awakenings.¹⁹

In relation to motor development, evidence from several countries indicates a high prevalence of delay, approximately 15% for gross motor skills and up to 32% for fine motor skills, due to poor adherence to the WHO global guidelines for 24-hour movement behaviors in the early years.²³ These guidelines recommend against sedentary screen time until 2 years old, and as of 2 years old and among 3- and 4-year-old children, passive time with a screen should not exceed 1 hour. They even suggest replacing sedentary screen time with moderate or vigorous physical activity, which is beneficial for health.¹³

At present, due to the coronavirus disease 2019 (COVID-19) pandemic, the American Academy of Pediatrics (AAP) has complemented screen time limiting guidelines based on the Three C's: child, content, and context. In the context of the pandemic, the AAP considers that, most possibly, screen time may be longer than usual; therefore, it is important to prioritize content quality, establish guidelines for screen use, interact with children during their screen time, and refrain from offering screens as a reward.²⁴

From a different perspective, the French Academy of Sciences considers that, as of 4 years old, computers and gaming consoles may serve as a family game and accompanied learning support, although occasionally. It is believed that, at this age, playing video games alone may turn into a stereotypical and compulsive activity, leading children to take refuge in the world of screens to run away from the real world. Before 6 years old, exposure to screens may bring more risks than advantages. Likewise, well-designed programming may improve cognitive, cultural, and social performance between 3 and 5 years old. Unfortunately, there is no evidence

of the effectiveness of most apps classified as educational; they are aimed at memorizing academic skills, but are not based on established study plans and are supported by few or no contributions from specialists in development or teaching.¹⁹

In relation to e-books, they usually include interactive tools that reduce children's content comprehension or the interactions resulting from text-related dialogs due to distracting factors, such as visual effects.¹² It is important for parents to be aware that higher-level thinking skills and executive functions essential for academic success, such as task persistence, impulse control, emotional regulation, and creative, flexible thinking, are better taught and learned through social, not digital play, as well as through an adequate interaction between parents and children.²²

In this regard, in terms of positive and negative effects, it is recommended that parents help children develop good media consumption habits from an early age. The use of screens should be avoided in children younger than 18 months, except for video chatting.¹² Children younger than 2 years old learn and grow up when exploring the physical world around them^{3,12} and assimilate experiences and knowledge better when they interact and play with their peers and/or adults.^{3,12,25} Parents of children aged 18-24 months who want to start using digital media should choose high-quality programming and apps and avoid leaving children alone, with a continued interaction for a better learning.^{12,25} In children older than 2 years, screen time should be limited to 1 hour a day of high-quality programming.¹² Most studies agree on the need to have adult accompaniment during the process of using screens, selecting content and limiting exposure,^{3,5,20,25} in addition to other activities that are healthy for both mind and body (reading, learning, speaking, and playing together).¹²

Parents' perceptions: between consumption and socialization

By now, it is worth asking ourselves, like Carrasco Rivas did,²⁶ whether a mobile phone is a neutral technical object that meets different needs and interests or its use has become a

social construct that turns users into dependent individuals controlled by such technology. Whether the use children make of these devices is consistent with parents' expectations and whether family relations are transformed due to such use are still matters of discussion. In the domestic setting, technology use is related to an interest in affectionate and caring relationships whereas, in the market, it is related to the transformation of human needs into consumption products. The clash between these spaces compromises contested social interests: on the one side, family expectations regarding child care, education, and communication; on the other side, the prevailing interests offered by the market and media consumption.²⁶

In this regard, the AAP¹² indicates that the electronic media industry considers children aged 0 to 2 years and their parents as key consumer groups. Videos, music, and TV shows have been designed for them, as well as targeted at them, to encourage their consumption. Most children, even those living in low income households,²⁵ are increasingly using digital technology on a daily basis and are the targets of intense marketing.

According to the conclusions of a study,⁴ it is concerning that the parents of these children have a low perception of the consequences that device use at such an early age may have on their development: almost 80% of them considers that their use from an early age causes no harm at all. Another study⁵ reports that, although parents do monitor the contents to which their children are exposed, 4 out of 5 parents fail to activate parental controls, leaving their children at risk of accessing inappropriate content.

These parents find great comfort in allowing their children to use screens because it facilitates their care while they have to do other tasks or have to be in public or restricted areas^{3,4} (waiting rooms, cars). On other occasions, these devices are used as a system of reward and punishment.³ In addition, adults who are responsible for regulating children's screen activities are required to meet the demands that emerge from the device themselves, either because of their work or the market with its social media mass bombardment; this results in new tensions and a damaged relationship with their children.

FINAL CONSIDERATIONS

This article described various issues to be considered. First of all, as stated above, it is not a matter of considering screens good or bad by themselves, but rather their use, how and why parents introduce their children into a technological culture from a very early age, and how they protect them from potentially harmful effects. Although there are no conclusive studies, it is known that physical activity and ongoing interaction with adults are very important for an adequate development; based on this, we may infer the consequences of a sedentary behavior resulting from hours of screen use and an inadequate family interaction. In addition, the consequences of an early screen use may be more relevant for some age groups than others. Therefore, it is important for future studies to carry out a stratification analysis based on children's age, history, and the context to which each group belongs.

Knowing about this issue allows pediatric health care providers to offer their opinion about excessive screen use during child development to the families with whom they work, as well as to the communities where they work. It would be favorable to implement parent education programs to promote child stimulation at home in order to facilitate their development, focused on the need for bonding, communication between children and their family, and gross and fine motor activities. At the time these habits are acquired, parents play an important role; consequently, it would be advisable for pediatric health care providers to accompany them during this process. ■

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