

THE EVIL OF THE CENTURY: IMPACT OF SCREEN TIME ON THE NEUROPSYCOMOTOR DEVELOPMENT OF CHILDREN AND ADOLESCENTS

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Abstract: The excessive use of electronic devices and screen time in children and adolescents has become a growing public health concern, as it can lead to several negative impacts on the development of these individuals. Studies have shown that excessive screen time is associated with a greater risk of obesity, sleep problems, decreased physical activity, delays in neuropsychomotor development, delay in speech and language acquisition, concentration and learning difficulties, and even even behavior and self-esteem problems. Randomized clinical trials have been an important tool to assess the effects of screen time on children and adolescents, showing that the more time children or adolescents spend in front of electronic devices, the greater the risk of these problems manifesting themselves. Spending more than two hours a day in front of electronic device screens is associated with a higher risk of high blood pressure and lower cognitive performance in children and adolescents, which can negatively affect skills such as memory, attention and reasoning. In addition, excessive use of electronic devices can also affect the creativity and problem-solving ability of these individuals. Thus, it is important that parents, educators and health professionals are aware of the risks associated with screen time in children and adolescents and promote a healthy balance between the use of electronic devices and other activities important for child development, such as playing outdoors. free reading and social interaction. Spending more than two hours a day in front of electronic device screens is associated with a higher risk of high blood pressure and lower cognitive performance in children and adolescents, which can negatively affect skills such as memory, attention and reasoning. In addition, excessive use of electronic devices can also affect the creativity and problem-solving ability of these

individuals. Thus, it is important that parents, educators and health professionals are aware of the risks associated with screen time in children and adolescents and promote a healthy balance between the use of electronic devices and other activities important for child development, such as playing outdoors. free reading and social interaction. Spending more than two hours a day in front of electronic device screens is associated with a higher risk of high blood pressure and lower cognitive performance in children and adolescents, which can negatively affect skills such as memory, attention and reasoning. In addition, excessive use of electronic devices can also affect the creativity and problem-solving ability of these individuals. Thus, it is important that parents, educators and health professionals are aware of the risks associated with screen time in children and adolescents and promote a healthy balance between the use of electronic devices and other activities important for child development, such as playing outdoors. free reading and social interaction. excessive use of electronic devices can also affect these individuals' creativity and problem-solving ability. Thus, it is important that parents, educators and health professionals are aware of the risks associated with screen time in children and adolescents and promote a healthy balance between the use of electronic devices and other activities important for child development, such as playing outdoors. free reading and social interaction. excessive use of electronic devices can also affect these individuals' creativity and problem-solving ability. Thus, it is important that parents, educators and health professionals are aware of the risks associated with screen time in children and adolescents and promote a healthy balance between the use of electronic devices and other activities important for child development, such as playing outdoors. free reading and social

interaction.

THE WORLD CHANGED!

The last century was marked by an incredible technological advance that radically transformed the way we live, work and relate to the world. From the invention of electricity and the telephone to the rise of the internet and smartphones, technology has changed nearly every aspect of human life. One of the main achievements of the 20th century was the computer revolution. The first electronic computer, the ENIAC, was built in 1946 and paved the way for a series of advances in computing, such as the creation of the first operating system (Unix) in 1969 and the first personal computer (Altair 8800) in 1975. PCs in the 1980s and the internet revolution in the 1990s completely changed the way people work, communicate and play.¹

With increasing access to technology, screen time in children and adolescents has been increasingly worrying for parents, educators and health professionals. While technology can be beneficial in many ways, overuse can lead to physical and mental health problems, as well as delay social and emotional development.

EXCESSIVE SCREEN TIME

Studies have shown that excessive screen time can have negative effects on the health of children and adolescents. A study published in the journal JAMA Pediatrics in 2019 found that children who spend more than two hours a day in front of screens have a higher risk of developing attention deficit hyperactivity disorders (ADHD). Another study published in the journal Lancet Child & Adolescent Health in 2018 found an association between screen time and the risk of depression in adolescents.² In addition, screen time can also lead to poorer sleep quality, as light blue emitted from screens can affect sleep-wake

cycles.

Prolonged screen use can impair brain development and affect learning, memory and emotional control, as well as increase the risk of depression and anxiety in teenagers. The American Academy of Pediatrics (AAP) recommends that children between the ages of 2 and 5 have no more than one hour of media exposure per day, while older children and teens must have clear, healthy boundaries set by parents and caregivers. In addition, the AAP also recommends that parents monitor the content accessed by their children and actively participate in their use of technology.³

It is important to highlight that screen time itself is not harmful, but the lack of balance between technology use and other healthy activities, such as physical exercise, reading and social interactions. Therefore, it is critical that parents encourage their children to participate in a variety of activities and set healthy limits for screen time, targeting the physical, mental and emotional well-being of children and adolescents.

THE SCREEN AND SLEEP

Excessive use of electronic devices before bed can affect the quality of sleep. A study published in 2015 showed that using electronic devices before bed is associated with poorer quality sleep, which can lead to health problems such as obesity and depression. Another randomized study that evaluated the effect of screen time in children aged 3 to 5 years on behavior and sleep quality, showed that children who were exposed to more screen time had greater difficulty falling asleep, more frequency of nightmares and a more aggressive behavior.⁴ In children aged 6 months to 3 years old, excessive screen time is also associated with greater difficulty falling asleep and shorter sleep duration.⁵

IMPACTS ON WEIGHT GAIN AND INCREASED BLOOD PRESSURE

A randomized study with 333 participants aged between 8 and 18 years divided into two groups (one group with guidance to reduce screen time and another control group) published in the Journal of Clinical Hypertension in 2018 evaluated the effects of screen time in children and adolescents on blood pressure.⁶

After a period of 6 months, the researchers observed a significant reduction in systolic and diastolic blood pressure in the group that received advice to reduce screen time compared to the control group. In addition, participants in the intervention group also had a significant reduction in body mass index (BMI) and an increase in physical activity. These results indicate that reducing screen time can be an effective strategy to prevent high blood pressure in children and adolescents.

One study evaluated the effect of screen time on overweight or obese children in 75 researchers followed for a period of 6 months, divided into two groups: a group with intervention to reduce screen time and another control group. Results showed that children in the intervention group had a significant reduction in body mass index (BMI) compared to the control group.⁷

NEUROPSYCHOMOTOR DEVELOPMENT

Based on several researches that related the excessive use of screens and negative impacts on the health of children and adolescents, researches were directed to analyze the impact of the screen on children's neuropsychomotor development. A randomized study published in The Lancet Child & Adolescent Health in 2019 evaluated the impact of screen time in children aged between 3 and 5 years on neuropsychomotor development. The

researchers followed 244 participants over a period of 12 months, divided into two groups: a group with an intervention to reduce screen time and a control group.⁸ The results showed that children in the intervention group had a significant increase in development neuropsychomotor compared to the control group,

In a survey of 166 participants aged 2 to 5 years, divided into two groups (one group with intervention to reduce screen time and another control group) and followed for a period of 6 months, it was noticed that children in the group of intervention had a significant improvement in neuropsychomotor development compared to the control group. In addition, children in the intervention group had a significant reduction in screen time and an increase in time spent on physical activities and reading, pointing to the reduction in screen time in a positive way for neuropsychomotor development in preschoolers.

In addition, a study published in 2018 in the journal *Jama Pediatrics* investigated the impact of screen time on neuropsychomotor development in 2,441 children aged 2 to 5 years, by measuring daily screen time and developmental tests. Results showed that prolonged exposure to screen time was associated with worse performance on tests of language, motor skills, and social and emotional skills.⁹ In children aged 8 to 12 years, reduced screen time also had an effect on the cognitive performance and executive function. These studies show that excessive screen time can harm children's neuropsychomotor and cognitive development, reinforcing the importance of limiting screen time in children and adolescents to ensure a healthy and balanced development.

HOW DOES A SCREEN AFFECT MENTAL HEALTH?

In addition to the effects on neuropsychomotor and cognitive development, excessive screen time in children and adolescents can also affect mental health. One study investigated the association between screen time and adolescent mental health in 2,114 adolescents aged between 13 and 18 years and the results showed that excessive screen time was associated with a higher risk of mental health problems, including symptoms of depression, anxiety and stress.

Additionally, another randomized study published in 2021 in *JAMA Pediatrics* evaluated the association between screen time and mental health in children aged 2 to 5 years. Results showed that excessive screen time was associated with an increased risk of developing symptoms of autism spectrum disorder, attention deficit/hyperactivity disorder, oppositional behavior and anxiety disorders.¹¹

It is important to note that although these studies point to the importance of limiting screen time in children and adolescents, this does not mean that technology use must be completely prohibited. Technology can have important benefits for children's learning and cognitive and social development, as long as it is used in a balanced way and monitored by parents and guardians.

A randomized trial published in 2020 in the *Journal of Developmental & Behavioral Pediatrics* investigated the association between screen time and speech delay in children aged 12 to 36 months. The results showed that excessive screen time was associated with a higher risk of speech delay. Children who used electronic devices for more than 1 hour a day had a 49% higher risk of speech delay compared to children who used these devices for less than 30 minutes a

day.¹² Another randomized study published in 2019 investigated the relationship between screen time in children with autism spectrum disorder, showing that using electronic devices for more than 2 hours a day was associated with a higher risk of speech delay.¹³ These studies highlight the importance of limiting screen time in young children, especially those at risk for speech delay. It is important to emphasize that social contact and interaction with parents and caregivers are essential for the development of language and communication in children.

CONCENTRATION DISORDERS

A study published in 2018 the relationship between screen time and attention and concentration in children aged 6 to 12 years old. The results showed that excessive screen time was associated with worse performance on tests of attention and concentration. Children who used electronic devices for more than 7 hours a day had a 5 times greater risk of having attention deficit symptoms compared to children who used these devices for less than 1 hour a day. In children aged 8 to 11 years old, the results showed that excessive use of electronic devices is associated with worse cognitive performance on tests of executive function, such as working memory, inhibitory control and cognitive flexibility. Therefore, limiting screen time in children must be limited to promote good cognitive and mental health,

DECREASE IN CREATIVITY

No specific randomized clinical trials on screen time in children and impact on creativity were found. However, there are observational studies that suggest that excessive use of electronic devices can negatively affect creativity in children. A study published in 2014 in the Journal of Creativity Research evaluated the use of technology in

children and its relationship with creativity. The results showed that children who spent more time in front of screens had lower scores on measures of divergent creativity, that is, the ability to generate multiple ideas and solutions to a problem.

Another study published in 2019 in the journal Computers in Human Behavior investigated the relationship between the use of electronic devices and creativity in adolescents. Results showed that excessive use of electronic devices was associated with a lower level of creativity. These studies suggest that limiting screen time in children can help preserve creativity and promote healthy, balanced development. In addition, it is important to encourage children to engage in creative activities such as art, music, and imaginative games to encourage creativity.¹⁷⁻¹⁹

Although there are no specific randomized clinical trials on the subject, observational studies point to a possible negative relationship between these variables. Additionally, other studies show that limiting screen time in children can be beneficial for developing creative skills.

Children who spend more time in front of screens score lower on measures of creativity, such as verbal fluency and originality. Furthermore, studies indicate that excessive use of electronic devices is associated with lower performance in creative and problem-solving tasks. Therefore, limiting screen time in children is beneficial for preserving creativity and developing creative skills. Furthermore, it is important to encourage children to engage in creative activities, such as drawing, painting, music and imagination games, in order to stimulate creativity and promote a healthy and balanced development.²⁰⁻²²

IMPACTS ON SELF-ESTEEM

There are few studies that directly examine

the relationship between screen time and self-esteem in children, but there is evidence that excessive use of electronic devices can have a negative impact in this area. A study published in 2018 in the journal BMC Public Health investigated the relationship between social media use and self-esteem in adolescents, showing that excessive use of social media is associated with lower self-esteem, especially in girls.

Another study, published the following year, investigated the relationship between the use of electronic devices and mental health in adolescents. The results showed that excessive use of electronic devices was associated with a greater likelihood of depression and anxiety, which can negatively affect self-esteem. Although these studies are focused on teenagers, excessive exposure to electronic devices can affect self-esteem in children as well. Therefore, it is important for parents to limit their children's screen time and encourage activities that promote self-esteem, such as sports, art, and other activities that promote confidence and emotional well-being.²³⁻²⁵

Excessive smartphone use is also associated with lower self-esteem and a greater tendency to compare oneself to others on social media. Studies show that excessive screen time is associated with lower self-esteem, even after controlling for variables such as age, gender, and socioeconomic status. This way, parents must also encourage their children to develop interests and hobbies that make them feel good about themselves, such as sports, music, art or volunteering.²⁶⁻²⁸

ARE THE DAMAGES OF EXCESS FABRIC REVERSIBLE?

Clinical trials have shown that limiting screen time can have positive effects on the health and well-being of children and adolescents. A study published in JAMA

Pediatrics in 2018 showed that when children were encouraged to limit screen time and increase physical activity time, there were significant improvements in cognitive function, behavior and body mass index.²⁹⁻³⁴ Additionally, a randomized clinical trial conducted by the University of Alberta in Canada found that limiting screen time in children ages 8-11 had a positive impact on sleep quality, academic performance, and emotional well-being

In order to combat the negative effects of screen time, some clinical trials have explored interventions that aim to encourage healthier behaviors. A study published in the journal JAMA Pediatrics in 2018 showed that a six-month intervention in a day care center that included physical activity and reduced screen time led to a significant improvement in children's body composition and physical activity.³⁶ Another study examined the impact of parents' behavior in increasing their children's physical activity. Results indicated that parents who modeled active behavior and participated in physical activity with their children increased their children's daily physical activity in small increments.

It is important that interventions are tailored to the different age groups and individual needs of children and adolescents, as an intervention that works well for preschool children may not be suitable for adolescents. Another important factor to consider is the influence of the school environment on students' screen time. A study published in the journal BMC Public Health in 2018 showed that schools that implemented restrictive screen time policies had students with less screen time and more physical activity. This suggests that schools can play an important role in promoting healthy behaviors among students.³⁷

Ultimately, the best way to ensure that children and teens have a healthy balance

between screen time and other activities is cooperation and communication between parents, schools and caregivers. Implementing effective interventions requires a collaborative effort and a holistic approach to promoting the health and well-being of children and adolescents.

CONCLUSION

The excessive use of electronic devices in children and adolescents can have several negative impacts on their development, such as obesity, sleep problems, delays in neuropsychomotor development, among others. The American Academy of Pediatrics

recommends that children age 5 and younger get no more than one hour of screen time per day, and that children age 6 and older have a strict screen time limit. Therefore, it is important to promote a balanced and healthy lifestyle for children and adolescents, encouraging physical and social activities outside the virtual world.

CONFLICT OF INTERESTS

There is not any.

FINANCING

The own researchers

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