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# Impact of excessive use of screen time on child development: A review

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**Abstract**

This review examines the extensive impact of excessive screen time on child development, encompassing language, social-emotional, physical, and cognitive domains, and its contribution to developmental disabilities. The COVID-19 pandemic has significantly escalated children's screen usage by approximately 52%, intensifying concerns, particularly in regions like India, where it is linked to brain development issues and an obesity epidemic due to reduced physical activity. Research consistently demonstrates negative correlations between excessive screen time and critical developmental milestones. Language development is hindered by limited real-life interactions essential for vocabulary acquisition and communication skills, often leading to delayed speech. Social-emotional growth is compromised as reduced face-to-face interactions impede the development of empathy, relationship-building, and social awareness, contributing to increased aggression and emotional reactivity. Physically, prolonged screen use fosters a sedentary lifestyle, elevating risks of obesity, musculoskeletal problems, eye strain, vision issues like myopia, and disrupted sleep patterns due to blue light exposure. Cognitively, excessive screen time negatively impacts memory, reasoning, and attention, impairing higher-order thinking skills and academic performance, and is associated with increased risks of suicidal thoughts and mood disorders in adolescents. Furthermore, a growing body of evidence links excessive screen time to the emergence or exacerbation of neurodevelopmental disorders, including developmental delays in young children, attention deficit hyperactivity disorder (ADHD), and autism spectrum disorder (ASD). Studies indicate a significant association between increased screen exposure and behavioral problems, learning disabilities, hyperactivity, and conduct disorders. To mitigate these adverse effects, leading health organizations such as the American Academy of Pediatrics (AAP), the U.S. Centers for Disease Control (CDC), and the World Health Organization (WHO) provide strict screen time guidelines, recommending no screen time for infants under 18-24 months (except for video calls), limited use for toddlers, and a maximum of 1-2 hours daily for older children. This review underscores the critical need for a balanced approach to technology integration in children's lives, prioritizing holistic development through real-world interactions and physical well-being.

**Keywords:** Screen time, development, children, physical development, cognitive development, emotional development, social development, technologies, digital learning, innovations etc.

## Introduction

Screen time has become a significant part of modern life, especially for children. Since the pandemic, there has been a substantial increase in children's screen usage, rising by about 52%. As screens replace traditional play and face-to-face interactions, the developmental consequences are becoming more evident, particularly in India, where rising screen time has contributed to various disorders, including issues related to brain development. Dr. Nagpal warns that excessive screen use is also linked to physical inactivity, which is driving an obesity epidemic in the country (Clarance, 2024) [9].

Screen time refers to the amount of time spent using digital devices such as smartphones, computers, TVs, tablets, and video game consoles (Wikipedia, 2025) [18]. Excessive screen time can lead to various physical and mental health problems, including obesity, sleep disturbances, depression, anxiety, and behavioral issues. Experts recommend limiting screen time to 1-2 hours per day, encouraging children and adults to engage in other activities that promote their well-being. The concern over screen addiction is growing, with psychologist Dr. Aric Sigman discussing how many

children are increasingly dependent on screens in a problematic way (Clarance, 2024) [9]. Excessive screen time has raised concerns about its impact on children's cognitive, linguistic, and social-emotional development, as it includes both traditional media like TV and newer digital platforms such as social media, gaming, and internet use (Meena *et al*., 2020) [19]. As technological devices like smartphones, tablets, and gaming consoles have become more prevalent, young people have spent increasing amounts of time on them. However, excessive screen time can negatively affect their physical, cognitive, and emotional development (CHOC, 2024) [4].

Children in the U.S. between the ages of 8-12 spend an average of 4-6 hours daily on screens and teens spending up to 9 hours a day (AACAP, 2024) [3]. As they grow older, children are more likely to have their own mobile devices, which increases their access to online content. By the time they near the end of primary school, around 66% of children use mobile phones to go online, compared to just 41% of children under 5 and 38% of those aged 5-7. More than half of 8-11-year-olds own their own mobile phones, and many in this age group also engage with social media, despite age restrictions that limit usage to those over 13. Screen time tends to be higher on weekends, with children spending an average of 3-4 hours on devices, compared to 1-2 hours on weekdays (internetmatters.org, 2024) [14]. Dr. Yang notes that screen time has steadily increased over the past decade, with teens now spending about 8 hours per day on screens, up from 6 hours in 2015. Preteens also experience a similar rise in screen usage, averaging 5 ½ hours daily, a one-hour increase from ten years ago. Much of this time is spent watching TV, with significant increases noted in 2019, just before the COVID-19 pandemic (CHOC, 2024) [4].

**Effect of excessive screen time on childhood development**

Excessive screen time can negatively effects on child's development in many ways, including

1. Language development
2. Social-Emotional Development
3. Physical health
4. Cognitive development

**Language development:** The early years of childhood are crucial for language development, particularly in vocabulary and phonology (Mustonen, 2022) [6]. Excessive screen time can interfere with this development by limiting real-life interactions, which are essential for acquiring language skills. Face-to-face communication and exposure to diverse vocabulary are key drivers of language acquisition (Prapoorna, 2023) [5]. According to Dr. Kumar, excessive screen time has been linked to delayed speech development, often mistaken for conditions like selective mutism or autism (Momaya, 2024) [25]. Several studies show a negative or no correlation between screen time and children's language abilities. For instance, a 2020 review of 42 studies found that increased screen time was associated with lower language skills (Lowry, 2023) [22], and a study of 157 toddlers showed similar results (Dynia, 2021) [20]. Additionally, a 2022 study indicated that children aged 17 to 36 months who spent more time on screens had smaller vocabularies, though no such effect was observed in younger children (12 to 16 months) (Alroqi, 2022) [21].

**Social-Emotional Development:** Dr. Kumar highlights that excessive screen time can negatively impact the development of social skills in children. Spending more time on screens limits real-life social interactions, which are crucial for learning communication, empathy, and relationship-building (Momaya, 2024) [25]. This lack of interaction can lead to poorer social awareness, difficulty in forming relationships, and a decreased sense of concern for others (Prapoorna, 2023) [5]. Research has shown that excessive screen use is associated with negative physical and cognitive effects, as well as increased risks of obesity, sleep disturbances, and mental health issues like depression and anxiety. For example, a study found that increased TV exposure in children aged 6 to 18 months was linked to higher emotional reactivity, aggression, and externalizing behaviors (Oswald, T.K., 2020) [7]. Furthermore, a longitudinal study by Sheri Madigan, PhD, at the University of Calgary found that more screen time at ages 24 and 36 months was associated with poorer outcomes in behavioral, cognitive, and social development at age 36 months (Pappas, 2022) [23]. These findings suggest the importance of limiting screen time for young children.

**Physical Health:** Excessive screen time, poor ergonomics, and improper viewing distances can lead to a sedentary lifestyle, reducing opportunities for physical activity and contributing to eye strain, vision problems, and disrupted sleep patterns in children. Prolonged sitting can also increase the risk of obesity, cardiovascular issues, and musculoskeletal problems. Digital eye strain, myopia, and dry eyes are becoming more common among children who spend long hours on screens. Regular breaks and proper eye care can help alleviate these risks. The blue light emitted by screens disrupts melatonin production, which affects sleep quality and, in turn, cognitive function and emotional well-being. To counteract these effects, it's crucial to establish screen-free bedtime routines and encourage outdoor activities (Prapoorna, 2023) [5]. Dr. Kumar emphasized that prolonged screen use can cause digital eye strain, blurred vision, and headaches, and warned that poor posture from extended screen time can lead to neck, shoulder, and back pain. He recommended that parents ensure children get adequate physical activity each day, promoting outdoor play and movement (Momaya, 2024) [25].

**Cognitive development:** Excessive screen time can negatively affect children's cognitive development, including memory, reasoning, and attention, hindering their ability to focus and engage in active learning. Passive media consumption, like watching videos or playing mindless games, limits intellectual stimulation and may impair the development of higher-order thinking skills essential for academic success and critical thinking (Prapoorna, 2023) [5]. While certain screen-based activities, like e-books or educational apps, may enhance early reading and creative skills, research also shows negative impacts on cognitive functions, such as executive functioning and sensorimotor development. A study from the Quebec Longitudinal Study of Child Development found that increased TV exposure at age two was linked to decreased participation in class and lower math proficiency in fourth grade (Muppalla *et al*., 2023) [1]. Furthermore, adolescents who spend over five

hours daily on digital devices are more likely to experience suicidal thoughts or actions, with a 70% higher risk compared to those who spend less time on screens (Twenge *et al*., 2017) [24]. Excessive screen time can also lead to sleep deprivation, contributing to depression and other mood disorders.

**Emergence of development disabilities among young children due to increased screen time**

Excessive screen time usage has been linked to a growing number of health and developmental issues, particularly in children. Research indicates that it contributes to developmental delays in young children, especially under 5, affecting areas like language acquisition and communication. A study published in *PLOS One* found that increased screen time was associated with delays, particularly for children under 2 years old. Dr. Swati Chhabra, a pediatric specialist, noted that while screen time isn't a direct cause, it is contributing to a rise in neurodevelopmental disorders like autism. Children exposed to screens may struggle with social interactions and mimic behaviors from what they watch.

Further, excessive screen exposure can lead to eye health issues like myopia, which, if left untreated, can result in more serious problems such as glaucoma and retinal detachment, according to a study in *BMC Public Health*. Dr. Kadam Nagpal, a neurologist, also highlighted how screen addiction disrupts children's sleep-wake cycles, leading to attention and memory issues.

Psychotherapists and psychologists, such as Dr. George Lynn and Dr. Aarushi Dewan, have also pointed out the psychological consequences of screen overuse, including personality issues, insomnia, back pain, anxiety, loneliness, and guilt. Dr. Dewan emphasized that the critical cognitive development in children aged 0 to 2 years is often compromised due to screen exposure, replacing vital activities for neurodevelopment.

Additionally, Dr. Rakesh K Chadda from Amrita Hospital noted a rise in Emotionally Unstable Personality Disorder (EUPD), especially among young females. This condition, often exacerbated by screen addiction and cyberbullying, can lead to severe mental health problems like depression, anxiety, substance abuse, and self-harm (Clarance, 2024) [9].

A study conducted among 101,350 children aged 0-17 found that excessive screen time was prevalent, with 70.3% of preschoolers (0-5 years) and 80.2% of older children and adolescents (6-17 years) exceeding recommended screen time limits. The research linked excessive screen time to a range of developmental and behavioral issues, including behavioral and conduct problems, speech disorders, learning disabilities, autism spectrum disorders (ASD), and attention deficit hyperactivity disorder (ADHD), with stronger associations in preschoolers. Additional concerns related to excessive screen use included delayed language and social skills, behavioral problems, violence, and attention difficulties, as well as physical health issues like obesity and sleep disturbances. The study highlighted a more significant impact on preschoolers and boys, emphasizing the need for early intervention in managing children's screen time (Guangbo *et al*., 2023).

Furthermore, the study found differences in screen time across rural and urban settings. Urban boys averaged 6.59 hours of screen time per day, while rural boys averaged 3.28 hours. Urban girls spent 4.28 hours on screens, and rural girls spent 4.07 hours. When screen time exceeded two hours, rural boys showed higher emotional problems, while urban boys had more conduct issues and hyperactivity. Among girls, rural girls experienced more conduct problems, while urban girls had more peer-related and hyperactivity issues (Ilamparithi & Selvakuma, 2017) [11].

A meta-analysis involving 81,234 children, including 28,997 with ADHD and 52,237 healthy controls, found a significant association between excessive screen time and an increased risk of ADHD. The odds ratio (OR) for children with screen time of 2 hours or more per day was 1.51 (95% CI: 1.20-1.90), indicating a positive correlation between screen exposure and the development of ADHD. This suggests that reducing daily screen time may help prevent ADHD in children (Liu *et al*., 2023) [12].

Further analysis revealed that screen time increased with age, and children under 3 years old had an average daily screen time of 55.83 ± 58.54 minutes. Binomial logistic regression showed that early and excessive screen exposure was linked to a greater risk of hyperactive behaviors. For children aged 0-3, daily screen time exceeding 90, 120, 150, and 180 minutes increased the risk of hyperactivity, with risk values rising significantly as screen time increased (Wu *et al*., 2022) [13].

Additionally, a study of 5-year-olds revealed that children who spent over 2 hours per day on screens were 7.7 times more likely to meet the criteria for an ADHD diagnosis compared to those who watched less than 30 minutes. The impact of screen time on attention span surpassed other common factors, including inadequate sleep, socioeconomic status, and parental stress (Brennan & McQueen, 2022). [17]

Emerging evidence suggests a link between screen time during early childhood and an increased risk of autism spectrum disorder (ASD), although the causal connection remains unclear. A recent study involving 84,030 children found a positive association between screen time and ASD risk, with another study indicating that daily screen time exceeding 8.5 hours was linked to a higher likelihood of an ASD diagnosis (Lin *et al*., 2024) [15]. Additionally, a study by Nagata *et al*. (2023) [16] reported that children averaged 4.0 hours of screen time per day, and each additional hour of screen time was associated with a 7% higher prevalence of conduct disorder and a 5% higher prevalence of oppositional defiant disorder (ODD) one year later. Specific types of screen time, such as social media, video chatting, texting, television/movies, and video games, were also linked to a higher prevalence of these disorders. Notably, exceeding 4 hours of daily screen time was associated with a 69% increased prevalence of conduct disorder and a 46% increased prevalence of ODD.

**Recommendations for limiting screen time:** According to the American Academy of Pediatrics (AAP) and the U.S. Centers for Disease Control (CDC), screen time guidelines for children are as follows:

- **Children under 18 months:** No screen time, except for video calls with family and friends.
- **Children aged 18 to 24 months:** only engage with high-quality educational content, but it should be done with parental involvement.

- **Children ages 2 to 5 years:** Screen time should be limited to no more than one hour per day.
- **Children aged 5 and older:** No more than two hours of screen time per day, with discussions with a parent or family member about what they are watching.
- **For pre-teens and teenagers:** Excessive screen time can have various effects on mental health, academic performance, and social skills. It is crucial to balance screen use with physical activity and other healthy habits.

Instead of children spending excessive time in front of screens, the agencies recommend engaging in simple, age-appropriate activities like playing ball games, riding bikes, doing outdoor chores, dancing to music, or taking the dog for a walk (CHOC, 2024) [4]. Additionally, the World Health Organization advises no screen time for babies under 2 and a maximum of one hour per day for children aged 2 to 4 (UNICEF).

**Strategies for managing screen time**

Managing screen time is crucial for maintaining the physical, mental, and emotional health of children, adolescents, and adults who spend significant time on screens. Excessive screen time can lead to poor sleep, decreased physical activity, and negative emotional effects. In today's digital world, parents face increasing challenges in managing their children's screen usage. With the temptation of smartphones, tablets, and video games, kids are spending more time than ever in front of screens. Nevertheless, parents can take proactive steps to reduce screen time and encourage healthier habits by creating strategies and maintaining open communication. This balanced approach helps children develop positive technology habits while prioritizing their well-being (Parashar, 2024) [8]. These strategies are:

1. **Set clear boundaries:** Create a daily or weekly schedule that allocates specific time slots for activities like homework, outdoor play, family time, and screen time.
2. **Lead by example:** Engaging in alternative activities like reading, exercising, or spending quality time together as a family.
3. **Create screen-free zones:** Such as the dining room, bedrooms, and family living spaces.
4. **Encourage outdoor play and physical activity:** Spend more time outdoors and engage in physical activity is an effective way to reduce their reliance on screens.
5. **Offer alternative activities:** Books, puzzles, board games, art supplies, and toys that stimulate creativity, imagination, and cognitive development.
6. **Foster open communication:** Encourage them to express their concerns, challenges, and interests, and work together to find creative solutions that strike a balance between screen time and other activities.

Experts suggest that promoting physical activity is the key to limiting screen time. Dr. Chhabra emphasizes encouraging creative activities for children, while the World Health Organization (WHO) highlights that increasing physical activity, reducing sedentary behavior, and ensuring quality sleep are essential for improving children's physical and mental health. This approach can help prevent childhood obesity and related health issues later in life. WHO stresses that for healthy growth, children should spend less time sitting and more time playing (Clarance, 2024) [9].

**Conclusion**

In conclusion, while technological advancements offer numerous benefits, excessive screen time presents substantial risks to children's overall development. The growing dependency on screens for entertainment, learning, and communication has led to significant concerns regarding its impact on cognitive, physical, and emotional growth. As research suggests, overexposure to screens can lead to disrupted sleep patterns, reduced physical activity, delayed language development, and impaired social interactions. While some screen time can be educational and engaging, the need for a balanced approach is critical. It is essential for parents, educators, and healthcare providers to work together to implement guidelines and strategies that minimize excessive screen exposure, promoting healthier, more holistic development in children. Prioritizing face-to-face interactions and physical activities alongside mindful use of technology is key to ensuring a balanced and well-rounded growth for future generations.

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