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Popular Article

Lost in screens: Understanding the impact of screen time on cognitive functioning

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Abstract

Electronic overuse is a rising concern around the world. Screen media has been linked to a variety of cognitive repercussions, both positive and negative. The bio-psychosocial research evidence emphasises the risk of increase in cognitive, emotional and behavioural deficits. Alterations in brain structure, lower levels of concentration and attention, and impaired learning and memory were the significant impact resulted due to excessive usage of screen time. Parents have a crucial role in limiting screen usage by adopting few techniques that reduce the higher exposure to screen could be helpful healthy development in children.

Introduction

Today's young children grow up surrounded by new technologies, like mobile phones and interactive screen media. Electronic gadgets have completely changed how people learn, communicate, and share information. However, new research suggests that using screens for media purposes may have long-term, detrimental consequences on children's health, which makes this a serious public health concern (Muppalla *et al*, 2023). Manfred Spitzer, a neuroscientist, created the phrase "digital dementia" to characterize the collapse of cognitive functions brought on by excessive use of digital technology.

Research has also shown that using screen media negatively impacts an array of cognitive domains, including academic achievement, sensori-motor development, and executive

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functioning. Teenage media multitasking has been shown to negatively affect executive functioning, specifically working memory, inhibition, and task switching ability. Therefore, screen media use has a substantial, if indirect, impact on children's cognitive development (Manwell *et al*, 2022).

Theories

The bio-psychosocial research in human and animal models demonstrates the chronic sensory stimulation caused by excessive screen time (i.e., spending more than two to three hours a day in front of computers, televisions, and mobile devices), which affects the brain development and increases the risk of cognitive, emotional and behavioural disorders among teenagers and young adults. Learning, memory, attention, focus, emotional control, and social functioning are all severely impaired by excessive screen usage. The effects of excessive screen time are comparable to mild cognitive impairment (MCI) symptoms, which include impaired concentration, orientation, social functioning, memory recall (retrograde amnesia), acquisition of recent memories (antero grade amnesia), and self-care. These mild cognitive impairment (MCI) symptoms are typically observed in adults in the early stages of dementia.

Impact of excessive screen time on early life cognitive-behavioural brain reserve

a. Alterations in brain structure

An excessive amount of screen time is associated to alteration in occipital cortex (reduction in volume, thinning & sulcal depth), thinning temporal cortex, reduced insula volume and smaller orbito frontal volume of prefrontal cortex as well as reduced functional connectivity in cortico-subcortical circuits, changes in limbic structures (i.e., smaller hippocampus, amygdala, ventral striatum) and microstructure abnormalities in gray and white matter (Priftis and Panagiotakos, 2023).

b. Lesser attention and concentration levels

Screen time can contribute to developmental difficulties such as reduced executive control (focused and sustained attention), poor inhibition, vulnerability to distractions, shallow information processing, and worse academic performance. It also affects cognitive capacity (working memory and functional fluid intelligence) (Priftis and Panagiotakos, 2023).

c. Impaired learning and memory

Time spent on screens is correlated with a range of adverse outcomes, including decreased metacognitive and self-regulation skills, lower crystallized and fluid intelligence, poorer

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vocabulary and reading comprehension, poorer long-term memory, poorer sensori-motor skills, impaired spatiotemporal abilities, problem solving and language acquisition, and worse academic performance (Priftis and Panagiotakos, 2023).

Techniques for controlling and limiting youngsters' usage of screens

- ✓ Setting time limits for electronic devices like Television, computer, or video game and digital versatile disc (DVD)
- ✓ TV Turn-off Challenge which is a campaign to turn off the TV for a specified number of days.
- ✓ The conditional use of screens on exercise, or the use of small or large media (billboards, brochures, and newsletters) for education.
- ✓ The birth kits that maternity units provide to mothers ought to include instructions about how young children should be exposed to screens.

Parent's role in Screen Time Management

Few parents reward their children with screen time, while others get worried that technology might negatively affect their conduct, social skills, sleep patterns, and physical exercise. As the primary caregivers, parents have the opportunity to enforce behavioral control in the household, usually through rule-setting and observation. Children spend less time on screens (such as television, video games, and computer/internet use) when parents adopt technological limitations. Parental controls, sometimes in the form of additional settings and password protection for various technological gadgets (such TVs, computers, phones, etc.), may provide an effective solution to parenting issues with children's screen usage (Muppalla *et al*, 2023).

Conclusion

Children's development might be positively or negatively impacted by excessive screen time. Use of screens can improve learning and enhance education in terms of cognitive growth. However, excessive screen usage can have a deleterious impact on brain development, sensorimotor development, executive functioning and academic performance. Early screen time has been linked to cognitive decline in later life. Parents play a significant role in controlling and limiting screen time by setting boundaries, raising awareness and by controlling behaviors. Therefore, it is vital that parents, teachers, and medical professionals recognize the possible dangers of exscessive screen time and put strategies in place to support kids' healthy growth, such as substituting activities that not only improve cognitive as well as social-emotional, and language skills.

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