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Short review

Can Cellphone Usage and Internet Addiction affect the Child Development?

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Abstract

During childhood the internet addiction is almost the only addiction that can be experienced. It can negatively impact children in several psychomotor development domains and its cognitive aspects can be affected as well. Internet addiction disorder has resulted in changes to emotional processing and brain functioning. It also affects the areas of the brain responsible for sensorimotor functions, cognitive functions, attention control, various inhibitory processes (including motor inhibition), decision-making processes and working memory. Spending time in cell phones, tablets or computers should be strictly controlled by caregivers and possibly it should be together with them.

Keywords: Cellphone usage; Children; Internet addiction; Psychomotor development

Introduction

There are several addictions that can impact adult people (nicotine, drug abuse, gambling), with a verified consequence on brain structure and function. During childhood the internet addiction is almost the only addiction that can be experienced. Yang Yang [1] found that children's Internet addiction was significantly negatively associated with children-adults interaction, loneliness and life satisfaction of parents. Nowadays it is common to see toddlers using their parents' cellphones to see cartoons, videos or even gaming. It appears to be the easiest way for appeasing them, so parents find comfort in letting their children spend time with cell phones or tablets. This is not a problem per se, but should be a concern when the amount of internet spent time becomes excessive.

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Researchers have already confirmed that internet addiction can negatively impact children in several components such as visual function, physical posture, ect [2,3]. Children's psychomotor development in its cognitive aspects can be affected as well.

Internet addiction impairs the brain's structure and function

It is already proved that Internet addiction (IA) alters the volume of the brain. The brain changes are similar to those produced by alcohol and cocaine addiction. Even though using technology isn't the same as using drugs or alcohol, the brain processes both addictions the same way. The brain, which identifies technology as a reliable way to release dopamine, signals us to spend even more time on the internet, increasing our risk of an internet addiction disorder. Constantly staring at screens can shrink the cerebrum and hippocampus, which help regulate our reading, thinking, learning, recognition and long-term memory. The brain will continue to negatively transform, as long as the addiction continues [4,5].

Several researches have showed that IA is associated with imbalanced interactions among the default mode network, fronto-parietal network and salience network, which may serve as system-level neural substructures for the uncontrollable Internet-using behaviors [6], and with areas related to the inhibitory control network (left inferior frontal gyrus, left frontal pole, left central opercular, left frontal opercular, left frontal orbital and left insular cortex) [7]. The structural changes in these parts of the brain seem to be dependent on the duration of the internet use or gaming, and they appear to have a cumulative effect [8].

Which components of children's psychomotor development are prone to be affected by internet addiction?

"Psychomotor" development refers to changes in a child's cognitive, emotional, motor, and social capacities from the beginning of life throughout fetal and neonatal periods, infancy, childhood, and adolescence [9]. It is significantly affected by lots of environmental factors, which have different impacts in different development domains.

Excessive internet use, as an environmental hazard, affects the areas of the brain responsible for processing visual information, and impairs the connections in the visual attention network that are associated with a reduced ability to focus and decision-making. Excessive online gaming also affects the areas of the brain responsible for sensorimotor functions, cognitive functions, attention control, various inhibitory processes (including motor inhibition), decision-making processes and working memory [8]. When children do excessive internet use, they tend to have psychological disorders [2]. Even though some researchers have found that the online activity was able to increase the ability to plan, visual perception, auditory memory and language expression in children [10,11], the Internet Addiction Disorder (IAD) has resulted in changes to emotional processing and brain functioning. Excessive screen time can decrease fatty tissues of white and grey matters, making concentration, focus, problem-solving, and decision-making difficult [4,5].

Internet addiction was found to have a stronger negative effect on urban children than rural children. Additionally, it has a significant correlation with the mental health of left-behind children, but not with children living with both parents [12]. These children categories are more prone to be neglected by parents or caregivers, who don't have enough time to take care and find cell phone usage as an easy way to soothe them for long periods. Therefore is not the internet usage per se, but its excess that can cause damages in brain and children psychomotor development.

In order to increase internet use that can provide benefits to children's development, they should start their early education about internet literacy from home and school. The role of parents and teachers in assisting the online activities, giving advice to malicious sites, and also controlling the frequency and duration of children's internet use. So the risk of internet usage can be reduced [10,13].

Cell phone usage during pregnancy

Several researchers suggest that not only postnatal, but even prenatal exposures as well may be associated with increased risks of emotional and behavioral difficulties in children [14,15]. Eleni Papadopoulou [16] reported a decreased risk of low language and motor skills at three years in relation to prenatal cell phone use, which might be explained by enhanced maternal-child interaction among cell phone users. Sudan M [17] found that children without emotional and behavioral difficulties at age 7 years, but who had cellphone prenatal exposures, had increased odds (OR=1.41) of emotional and behavioral difficulties at age 11 years.

Conclusion

It is proved that Internet Addiction can affect the brain growth and therefore can impact the children's psychomotor development in some domains such as communication, problem-solving and personal-social areas. Spending time in cell phones, tablets or computers should be strictly controlled by caregivers and possibly it should be together with them. Further research should be made in this field to determine the specific psychomotor domains that can be affected from internet addiction.

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