

Raising children in digital world: Impact of technological advancements on children's development outcomes

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Abstract - With the increasing use of technology and the advancement of the digital world, the concerns surrounding children's development have become more urgent than ever. The parental distress about their children's overall media usage has risen and there is a need to limit children's screen time which has become an integral part of their daily lives routine. Access to media and various social networking websites without any age restrictions not only hinders children's natural development but also exposes them to multifaceted risks. Reduced physical activity due to increasing digital media usage leads to reduced learning opportunities, further adding to issues like psychological stress and obesity amongst other developmental delays. This paper navigates into a review of literature that suggests how children are negatively affected by obsessive technology usage with psycho-social implications on children's development and impact on family relationships. The paper discusses implications from existing research and recommendations that can inform future research on how children are impacted by technology.

Key Words: *digital world, parental distress, media usage, developmental delays*

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Introduction

Technology is advancing at an enormous rate and continues to impact children's development outcomes and overall health. The disadvantages of technology have an especially far-reaching impact on a child's development. There has been a shift in the ways people work, learn and communicate, as new technologies have infiltrated and transformed life in the 21st century (OECD, 2022). Spending time online is associated with both potential risks and rewards. Children are afforded opportunities for self-expression, learning and consolidating friendships on the one hand, while being online also exposes children to risks such as harmful content and cyberbullying on the other (Sonia Livingstone, 2011). Some research suggests pre-schoolers become familiar with digital devices before they are exposed to books (Hopkins, 2013) and international trends suggest younger children are increasingly using digital technologies and the age of first use is dropping (Graafland, 2018).

Children have been described as digital natives (Sharkins, 2016). Children today have been viewed as a generation of digital technology and the internet (Sharkins, 2016). From an early age, children have been given devices. There have been many devices available, such as computers and tablets. Children have explored and discovered new concepts when using technology (Neumann, 2014). Technology has been defined as a tool a student could use to learn and grow (Sharapan, 2012). Educators believe that technology can expose children to inappropriate content and hinders their socialisation processes, as it leads to isolation, having consequently a negative impact on their social and emotional development (Donohue, 2015).

Objectives

- 1) To understand the impact of technology on children's development.
- 2) To analyze the factors that impact children's overall health.
- 3) To bring out possible recommendations and conclusion.

Methodology - To understand the nature of the issue, content analysis has been used for the information gathered through secondary data. In order to

achieve the research objectives, the data has been collected using information classified from the publications of books, monthly journals, articles and magazines.

Review of literature

Impact of technology on children's cognition and well-Being

Young people today are not just heavy users of digital devices but are also heavy practitioners of digital multitasking. The growing portability and early adoption of digital technology has meant that digital multitasking has become ubiquitous for the present generation of technology users. According to a recent survey by Pew Research Centre, 95% of teens have access to a smartphone, and 45% say they are online 'almost constantly' (Anderson, 2018). Statistics such as these have led to mounting concerns about the impact of persistent digital multitasking on the brains and minds of today's youth (Carlson, 2005). Some scholars argue that frequent multitasking may be particularly detrimental for young people as it may interfere with the development of attention networks and executive functions, resulting in attention difficulties and a susceptibility for frequent task-switching over sustained attention (Levine, 2007). Others, however, argue that the early exposure and constant access to technology by today's youth has created to a generation of 'digital natives', who have acquired a familiarity with technology and a multitasking proficiency quite unlike that of any previous generation (PA Kirschner and P De Bruyckere, 2017).

Impact of technology on children's emotions and behaviors

The use of digital technology has been associated with lack of attention, aggressive behaviors, physical inactivity, obesity, and sleep problems in preschool and school age children. The overuse of digital technology causes children to use their time inefficiently. Concern should also be paid to the cognitive and emotional effects that these technologies have on the development of children (Brown, 2011). Perhaps the most justifiable concern regarding the effects of technology on children and young people is related to the exposure to various degrees of violence, including cyberbullying and violent video

gaming. It is well documented that cyberbullying can have both short and long term impacts on children and young people's mental and physical health and also on their academic progress and achievement (McDougall, 2015). A large-scale study of students in Stockholm reports that emotional distress, suicide ideation and attempts, externalizing problems, such as substance abuse and criminal behaviour are also among the severe consequences of cyberbullying (S.B. Låftman, 2013). The exposure to violent video game play also raises similar concerns, as a number of studies suggest that it may increase hostility and aggressive behaviours, whilst decreasing empathy and prosocial behaviours (Williams, 2013). The overuse of technology in early childhood has been found to be related to cognitive, language, and social/emotional delays in community-based researches (Pagani, 2010).

Impact of technology on children's sleep quality

Keeping a television, computer, or mobile phone in the bedroom during early childhood is associated with less sleep (Cespedes, 2014). Children who make excessive use of social media or who sleep with mobile devices in their bedrooms are at increased risk of experiencing sleep disturbances (Levenson, 2016). Poor sleep quality in adolescents is associated with extreme mobile phone use while the number of devices in a bedroom and poor sleep quality are associated with excessive internet use and duration of digital technology usage prior to sleep in pre-adolescents (Bruni, 2015). The use of electronic devices during the daytime can also affect sleep quality (Hysing, 2015). The results of this study solidify some well-established data concerning childhood obesity—namely that children who watch more television are more likely to have an overweight or obese BMI. This study showed a statistically significant impact of television and/or cell phone use at bedtime is associated with elevated BMI in children and adolescents. The survey results highlight some associations between increased technology use and difficulty with sleep quantity in children and adolescents (Caitlyn Fuller, 2017). The data also suggest that overweight and obese children and adolescents were more likely to have trouble falling asleep and trouble staying asleep than their normal BMI counterparts. When children were reported by their parents to use one form of technology at

bedtime, they more than likely used another form of technology as well. For example, children watching television before bed were also more likely to be texting in the middle of the night than children who did not watch television before bedtime. In addition, children who watched more television were more likely to exhibit inattentive behaviors (Caitlyn Fuller, 2017).

Impact of technology on children's language development

As per a study done by Binnur, it was concluded that according to the teacher candidates' ideas, it can be said that technology has a positive effect on children's language awareness when it is used appropriately. Language teacher candidates are aware of this good impact and think the teacher is the key factor in this unlimited world. It is obvious that technology brings real world in front of children (Binnur, 2015). An observational study of 14 pairs of children (age range 7–24 months) and parents videotaped while watching television together shows that both the quality and quantity of parental utterances (Child-directed Speech) significantly declined while the TV was on, and especially when the infants were watching. This also led to an increase of frequency of 1-word sentences, quite often only short phrases, such as nouns (names). From a broader perspective, there is evidence that educational programmes targeting infants and toddlers have not achieved their purported learning goals (Hirsh-Pasek K., 2015). In conclusion, it can be suggested that young learners' teachers should use technology in their classes in order to increase their students' language awareness but the teachers should be careful while using technology inside and outside of the classroom, they should organize the activities according to children's age, language level, interests and needs. In addition, language teachers should lead the young learners and their parents to correct web sites after the class period. Teachers also should create task-based activities and prepare project-work for their students (Binnur, 2015).

Impact of technology on children's nutrition and obesity

Over the past three decades the prevalence of obesity among children and adolescents has increased and fitness has decreased (Troiano RP, 1998). Television viewing affects both fatness and fitness and multiple studies point

to television viewing as one cause of childhood obesity. Two primary mechanisms for this relation have been suggested: reduced energy expenditure from displacement of physical activity and increased dietary energy intake, either during viewing or as a result of food advertising. In a longitudinal study in New Zealand, up to 17% of the overweight prevalence observed at 26 years of age was estimated to be attributable to viewing >2 hours of television per day on weekdays during childhood and adolescence (Hancox RJ, 2004). Observational studies have also revealed that greater screen time is associated with cardiometabolic risk factors more broadly, including hypertension, elevated cholesterol levels, insulin resistance, elevated inflammation, and the metabolic syndrome (Strasburger, 2011). The association between television viewing and food consumption can be explained, in part, by the frequent references to food or the consumption of food that occurs during both commercials and programmes (Dietz WH, 1991). Technology can be integrated into existing programmes, making them more accessible, sustainable and individualised. Such integrated models have allowed both patients and professionals to track nutrition and lifestyle behaviours to identify opportunities for intervention and improve communication between these groups (LA Murphy, 2018).

Impact of technology on children's social isolation

Paradoxically, social media use is linked to social isolation (ie, a lack of social connections and quality relationships with others), which is associated with poor health outcomes and increased mortality (Firth J, 2019). Primack and colleagues studied 1787 young adults (ages 19 to 32 years) and found that using social media 2 or more hours each day doubled the odds for perceived social isolation compared with use less than 30 minutes each day (Primack BA, 2017). Similar associations between perceived social isolation and social media use were observed in 213 middle-aged and older adults (Meshi D, 2017). With the increased use of technology, children might not be adequately developing their social skills. This can lead to more children being socially awkward, withdrawn, shy, or intimidated by social situations. They might not know how to engage with other children or adults. Developing social skills takes practice,

and if technology is often in the way, there are fewer opportunities for kids to develop these skills (Associates, 2021). Electronic devices, in particular the cell phone/smartphone, appear to interrupt parents' conversations and activities with their preschool-aged child multiple times per day. Higher parent-child technology interference may be adversely associated with several subdomains of early childhood development (Valerie Carson, 2019).

Impact of television viewing on children's development

In several studies in the 1960s and '70s, American psychologist Albert Bandura found that children learn from and imitate the behaviour of individuals they observe, specifically when the individual is rewarded for aggressive acts. That finding corroborated the admonitions of those who suggested that children who constantly witnessed their favorite TV "heroes" being praised for beating up or killing the "bad guy" would, in turn, incorporate aggressive acts into their own repertoire of behaviours for use in situations characterized by conflict. Throughout the following decades, psychologists, sociologists, criminologists, and other social scientists have argued a number of different perspectives with respect to whether television violence facilitates or triggers violent behaviours in children. Some believe that watching violence on television likely causes a significant number of children to behave violently. Others have agreed that this may be true but that it is so only with children already susceptible to exhibiting violence (John L. Powel and Roberts, 2014). Some research has linked viewing television for longer periods of time during childhood with attention problems in adolescence (Landhuis, 2007), and has suggested there may be modest adverse effects of watching television before the age of 3 on cognitive outcomes later in childhood (Zimmerman, 2005). One contested study suggested that one extra hour of television at age 1 was associated with a 28% increase in the probability of having attentional issues at age 7, with similar effect sizes for the amount of television watched at age 3 on inattention later in childhood (Christakis, 2004). Health care professionals have also weighed in on the television debate. They believe that children who spend more time watching television are going to spend less time engaging in physical activity. Additionally, psychologists argue that the large amount of time spent watching TV threatens

the cohesiveness of the family. Such negative effects may also include inhibiting children's social development by diminishing the number of conversations between them and their family members (John L. Powel and Roberts, 2014).

Impact of Technology on Children's Physical Development

Physical development of children is also impacted by technology. In terms of the impact of physical activity on health, a study of 4- to 11-year-old American children found that while 37% had low levels of active play and 65% had high levels of screen time, 26% had a combination of both (Anderson SE, 2008). Data from the 2009–2010 National Health Examination Survey, using a representative sample of American 6- to 11-year-olds, found that fewer than four in 10 children met both physical activity and screen time guidelines (Fakhouri THI, 2013), while a study of Australian preschool children aged 2–6 found that those who watched more daily television had significantly higher BMI levels, which were moderated by both lack of physical activity and eating food while watching television (Cox R, 2012). Research has also shown that excessive screen use including television, video games, and the Internet predicted a variety of psychological and medical health issues (Martin, 2011). Further, research shows that children, preteens, and teenagers are using massive amounts of media and those with more screen time have been shown to have increased obesity, reduced physical activity, and decreased health (L.D. Rosen, 2014).

Recommendations

Parents and Health Care Professionals can help by (a) setting limits on daily screen time and sticking to them, (b) establishing “screen-free” zones (e.g., no smartphone use at the dinner table or in the car), (c) forbidding screens in the bedroom when it's bedtime and (d) leading by example by demonstrating responsible use of technology (College, 2021). Technological advances and cultural shifts have resulted in electronic devices being omnipresent in the lives of almost all families with young children. Findings from our study suggest that electronic devices, in particular the cell phone/smartphone, may interrupt parents' conversations and activities with their child multiple times per day.

This parent–child technology interference was found to be associated with lower response inhibition and emotional selfregulation as well as higher externalizing and internalizing. Though observed effect sizes were small. Future longitudinal and experimental research is needed to build on these findings. (Valerie Carson, 2019).

Conclusion

This paper has tried to illuminate those general factors and activities that impact children's health including children's psychological, physical and psychosocial health. These impacts of technology result in decreased physical activity also impacting children's eating habits. Overall, technology appears to impact children, teenagers and preteens thereby impacting their formative years. Parents, caregivers and teachers must be cautious of the damaging effects of technology on children's health and must encourage the children to reduce their overall technology use. Overall, the results of this study suggest that technology does appear to have an effect on health that differs between children and teenagers. These studies suggest that assisting children with eating more healthy food while simultaneously expanding their physical activity isn't the only answer for assisting them with accomplishing great wellbeing, what is additionally required is for the society to collectively think of strategies that enable children to attain holistic health and help them manage and/or moderate their usage of technology.

References

- Anderson SE, E. C. (2008). Active play and screen time in US children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: A nationally representative cross-sectional analysis. *BMC Public Health* .
- Anderson, M. A. (2018). *Teens, Social Media & Technology*. Washington, DC: Pew Research Centre.
- Associates, C. N. (2021, August). *The Impact of Technology on Children*. Retrieved from <https://www.cerritos.edu>: https://www.cerritos.edu/hr/_includes/docs/August_2021_The_Impact_of_Technology_on_Children_ua.pdf

- Binnur. (2015). How does technology affect language learning process at an early age? *ScienceDirect* .
- Brown, A. (2011). Media use by children younger than 2 years. *Journal of the American Academy*.
- Bruni, O. S. (2015). Technology use and sleep quality in preadolescence and adolescence. *Journal of clinical sleep medicine: Official Publication of the American Academy of Sleep Medicine* .
- Caitlyn Fuller, E. L. (2017). Bedtime Use of Technology and Associated Sleep Problems in Children. *Global Pediatric Health* .
- Carlson, S. (2005). The net generation goes to college. *The chronicle of higher education* .
- Cespedes, E. M.-S. (2014). Television viewing, bedroom television, and sleep duration from infancy to midchildhood. *Journal of the American Academy of Pediatrics* .
- Christakis, D. (2004). Early Television Exposure and Subsequent Attentional Problems in Children. *Pediatrics* .
- College, R. (2021). *Effects of Technology on Children During a Pandemic*. Retrieved from <https://online.regiscollege.edu>: <https://online.regiscollege.edu/blog/effects-of-technology-on-children/>
- Cox R, S. H.-T. (2012). Television viewing, television content, food intake, physical activity and body mass index: A cross-sectional study of preschool children aged 2–6 years. *Health Promotion Journal of Australia* .
- Dietz WH, S. V. (1991). Children, adolescents and television. *Current problems in pediatrics* .
- Donohue, C. (2015). Technology and digital media in the early years: Tools for teaching and learning. *Routledge* .
- Fakhouri THI, H. J. (2013). Physical activity and screen-time viewing among elementary school-aged children in the United States. *JAMA Pediatrics* .
- Firth J, T. J. (2019). The “online brain”: how the Internet may be changing our cognition. *World Psychiatry* .
- Graafland, J. H. (2018, September). New technologies and 21st century children: Recent trends and outcomes. *OECD Education Working Paper No. 179* .
- Hancox, R.J, M. B. (2004). Association between child and adolescent television

- viewing and adult health: a longitudinal birth cohort study. *Lancet* .
- Hirsh-Pasek K., Z. J. (2015). Putting education in “educational” apps: Lessons from the science of learning. *Psychol. Sci. Public Interest* .
- Hopkins, L. F. (2013). Books, bytes and brains: The implications of new knowledge for children's early literacy learning. *Australasian Journal of Early Childhood* .
- Hysing, M. P. (2015). Sleep and use of electronic devices in adolescence: Results from a large population-based study. *BMJ Open* .
- John L. Powel and Roberts, M. C. (2014). Effects of television viewing on child development. *Britannica* .
- L.D. Rosen, A. L.-R. (2014). Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits. *Computers in Human Behavior* .
- LA Murphy, S. B. (2018). The influence of technology on obesity in children and adolescents threats to, and opportunities for, health in our digital world. *Arch Dis Child* .
- Landhuis, C. (2007). Does Childhood Television Viewing Lead to Attention Problems in Adolescence? Results From a Prospective Longitudinal Study. *Pediatrics* .
- Levenson, J. C. (2016). The association between social media use and sleep disturbance among young adults. *Preventive Medicine* .
- Levine, L. E. (2007). Electronic media use, reading, and academic distractibility in college youth. *CyberPsychology & Behavior* .
- Martin, K. (2011). Electronic overload: The impact of excessive screen use on child and adolescent health and wellbeing. *Department of Sport and Recreation* .
- McDougall, P. (2015). Long-term adult outcomes of peer victimization in childhood and adolescence: Pathways to adjustment and maladjustment. *APA PsycArticles* .
- Meshi D, C. S. (2017). Social media use and perceived social isolation among young adults in the US. *American Journal of Preventive Medicine* .
- Neumann, M. M. (2014). Touch screen tablets and emergent literacy. *Early Childhood Education Journal* .

- OECD. (2022). *Children and digital technologies: Trends and outcomes*. Retrieved from [www.oecd-ilibrary.org: https://www.oecd-ilibrary.org/sites/71b7058a-en/index.html?itemId=/content/component/71b7058a-en](https://www.oecd-ilibrary.org/sites/71b7058a-en/index.html?itemId=/content/component/71b7058a-en)
- PA Kirschner and P De Bruyckere, M. P. (2017). The myths of the digital native and the multitasker, Digital natives, digital immigrants. *Teaching and Teacher Education, On the horizon* .
- Pagani, L. S. (2010). Prospective associations between early childhood television exposure and academic, psychosocial, and physical well-being by middle childhood. *Archives of Pediatrics & Adolescent Medicine* .
- Primack BA, S. A. (2017). Social media use and perceived social isolation among young adults in the U.S. . *American Journal of Preventive Medicine* .
- S.B. Låftman, B. M. (2013). Cyberbullying and subjective health: A large-scale study of students in Stockholm, Sweden. *Children and Youth Services Review* .
- Sharapan, H. (2012). From stem to steam: how early childhood educators can apply Fred Rogers approach. *Yc Young Children* .
- Sharkins, K. A. (2016). Preschool children's exposure to media, technology, and screen time: perspectives of caregivers from three early childcare settings. *Early Childhood Education Journal* .
- Sonia Livingstone, L. H. (2011). Risks and Safety on the Internet: The Perspective of European Children: Full Findings and Policy Implications From the EU Kids Online Survey of 9-16 Year Olds and Their Parents in 25 Countries. *LSE: EU Kids online* .
- Strasburger. (2011). Children, adolescents, obesity, and the media. *Pediatrics* .
- Troiano RP, F. K. (1998). Overweight children and adolescents: description, epidemiology and demographics. *Pediatrics* .
- Valerie Carson, N. K. (2019). The association between parent-child technology interference and cognitive and social-emotional development in preschool-aged children. *Wiley* .
- Williams, K. (2013). The effects of video game controls on hostility, identification, and presence. *Mass Communication & Society* .
- Zimmerman, F. A. (2005). Children's Television Viewing and Cognitive Outcomes: A Longitudinal Analysis of National Data. *Archives of Pediatrics & Adolescent Medicine* .