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Virtual Autism and Electronic Media: Impact of Screen Time on Early Childhood Development

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Abstract

Autism Spectrum Disorder (ASD) has been on the rise in recent years, and researchers have been identifying a number of potential contributing factors. One such concern arises from the association of excessive screen time with the development of ASD-like symptoms, which has created the concept of "Virtual Autism." This research paper investigates the impact that high-frequency electronic media and digital device use have on early childhood development and its potential link to ASD. The paper explores how a reduction in screen time reduces the threats associated with Virtual Autism. This paper brings forth the results that highlight parent-children interaction and free play as fundamental bricks towards healthy brain development at this early age. The conclusion thus is that the onset of ASD symptoms linked to screen addiction can be either prevented or reversed by restricting screen time while enhancing direct interactions. The paper contributes to the novel discussion on the role of media in child development and the wider aspects of controlling and preventing ASD.

1. INTRODUCTION

The footprint of technology and its interface with diverse dimensions of human life at this point becomes more visible than it has ever been before in today's rapidly changing digital landscape. One such interesting concept that has cropped up is "virtual autism," where long-time exposure to virtual environments might lead to autism-like behaviors **(Simeonov et al., 2024)**. It attracts attention because the child's autism-type symptoms arise from a deep immersion in the virtual world of games, media, and endless screen scrolling. A term first used in 2018 by the Romanian psychologist Marius Teodor Zamfir is "Virtual Autism." The latter noticed that children, particularly those under three years of age, who use a screen for more than four hours a day, are prone to suffer from "sensory-motor and socio-affective deprivation." Sensory-motor and socio-affective deprivation closely resemble most symptoms of Autism, like sensory, motor, cognitive, and socio-affective difficulties **(Zamfir, 2018)**. It is really important to understand what virtual autism is in the current digital world. It

describes behavior that is much like that of a person with autism spectrum disorder and emanates from virtual exposure over time **(Andersen, 2024)**. Virtual autism must be differentiated from ASD, as the latter is an inherent disease that cannot be brought on by excessive or long-term interaction with computer programs. Whereas sufferers of ASD have impairment with intrinsic communication and interaction, virtual autism shows behavior elicited by the virtual environment **(Sanjeevanam Hospital, 2024)**. Indeed, this disorder can be developed or exacerbated as a direct consequence of excessive implementation of digital technology. The name itself implies that observed patterns are related to the prolonged use of digital platforms or specific devices. These patterns are not symptoms of ASD but rather a response to the virtual environment stimuli. While ASD is characterized by real difficulties in communication and interaction, "virtual autism" implies that behavior can be influenced by a high level of involvement with digital technologies. This is where the important distinction starts coming in addressing the particularity of each of those concepts **(Adina, 2024)**. The boundary between virtual and real life has been blurred in a world where technology has become an indispensable part of everyday life. Children nowadays are exposed to screens more than ever, from educational tools to digital babysitters. Virtual autism can be diagnosed in children under three years of age, and this condition typically results from many hours of being in front of a screen, manifesting most symptoms associated with ASD. Some of these problems include communication problems, interaction challenges, repetitive behavior, and sensory hypersensitivity—all exacerbated by the digital world that holds their attention. This article is expected to define and emphasize the meaning of the term virtual autism, explore its association with technology, and present potential effects on cognitive and development. We illustrate how virtual autism shows its findings of research through case studies and expert opinion to understand the implications this has in a digital era.

2. UNDERSTANDING VIRTUAL AUTISM

Imagine a world where a child's main interaction is through a screen. In this digital world, virtual autism appears. This is a condition seen in young kids who show autism-like signs after spending too much time with screens. This isn't about a quick video call with a family member or a short educational game. It's about long, often unsupervised screen time that takes the place of physical play, exploring, and face-to-face interactions. The term "virtual autism" describes when young kids develop autism-like symptoms because they have been exposed to screens too much. This condition includes problems with communication, unusual behaviors, and difficulties with interaction **(Moller, 2024)**. It is important to tell the difference between virtual autism and autism spectrum disorder (ASD) because virtual autism is a temporary condition that can be improved with the right help, while ASD is a lifelong developmental disorder (Andersen, 2024).

3. VIRTUAL AUTISM VS. AUTISM SPECTRUM DISORDER (ASD)

The idea of Virtual Autism in today's digital age shows how too much screen time can affect young children, especially those under three years old. It shows symptoms similar to classic autism, like sensitivity to sensory inputs, delayed language development, and reduced interaction. Figure 1 explains the differences between Virtual Autism, which is mainly caused by too much screen time, and Classic Autism, also known as Autism Spectrum Disorder, which is influenced by genetics and environmental factors. Both forms show changes in behavior and repetitive actions, but their management strategies are different.
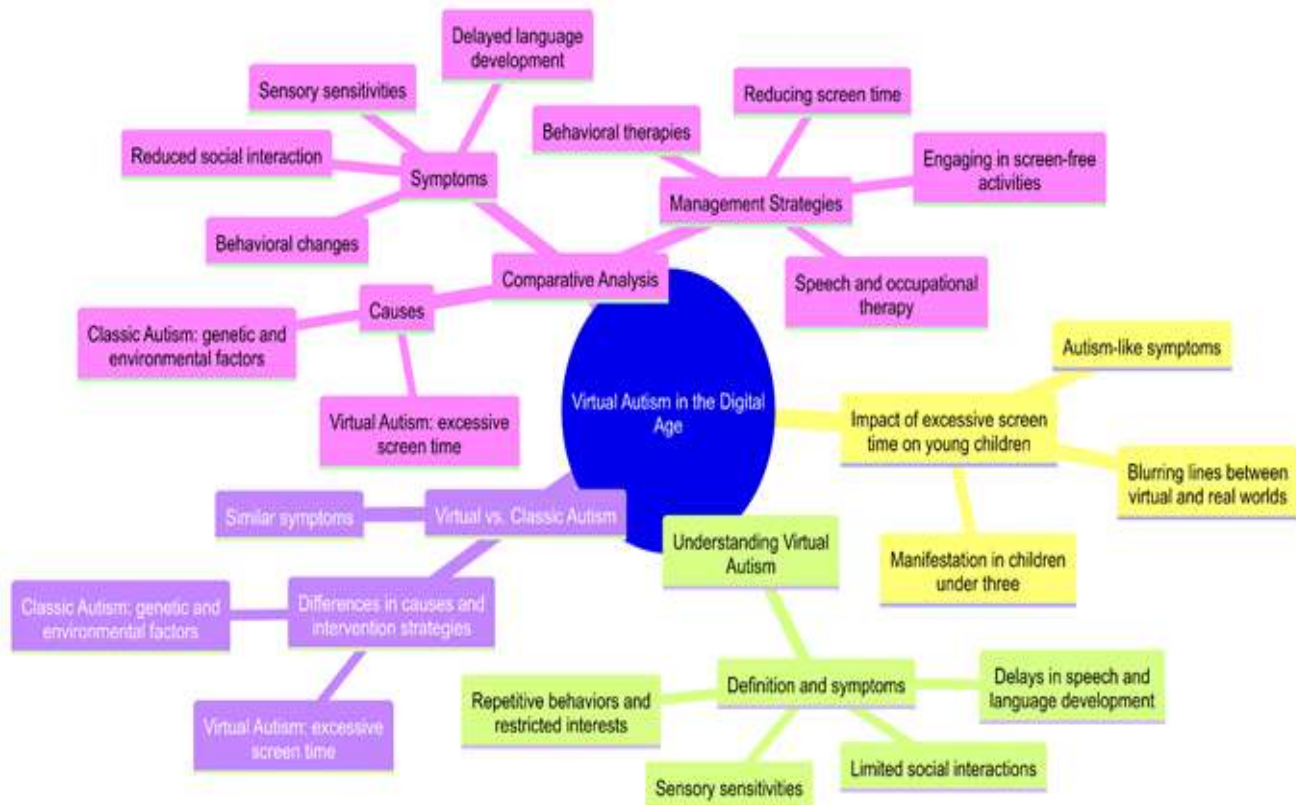
Fig-1: Virtual Autism in the Digital Age

Effective Management for Virtual Autism involves cutting down on screen time, doing activities without screens, and including behavioral, speech, and occupational therapies. When comparing Virtual Autism and Classic Autism, we find that while they have similar symptoms, their causes and treatment methods are different. Classic Autism is mostly due to genetic and environmental factors, which require long-term and complex treatments, whereas Virtual Autism can improve significantly with simple behavior changes like reducing screen time and increasing face-to-face interactions.

4. THEORIES OF VIRTUAL AUTISM

Children who spend much time on screens miss out on the usual language experiences and conversations with their parents, grandparents, and others. The fast-moving and overwhelming sounds and images from screens can be too much for the brain to handle, stopping important mental processes from developing **(Radesky et al., 2015).** As a result, children might get used to just watching passively, losing interest in understanding the real world and being satisfied with only sensory experiences. Interacting with virtual environments is quite different from

experiencing real life because they are fake and do not involve physical contact.

Research shows that not having real-world interactions and hands-on experiences can stop the proper growth of the brain pathways needed for thinking and learning. Watching TV and other screen activities takes away the quiet time children need to develop their inner language and thinking skills **(Christakis, 2009)**. The virtual world encourages passive learning instead of actively participating in gaining knowledge, leading to a state of mental inactivity. When children are introduced to the fun of screen-based entertainment, their brain development might be at risk. In early childhood, the brain needs stimuli from the outside world and movement to grow properly. During the first 2 years, known as the sensory-motor development stage, children learn to connect what they see, hear, and feel with their movements, becoming aware of their surroundings and how they can interact with them **(Swider-cios et al., 2023)**.

At birth, sensory experiences are not fully developed, but they grow into perceptions through interactions with the world. In cases of autism, various problematic behaviors might appear, like not being able to express or understand language, being sensitive to certain sounds, having limited

food choices, and repetitive behaviors (Kasari et al., 2013). The lack of physical interactions can badly affect a child's mental and emotional development, as shown by studies on sensory deprivation and lack of contact by Donald O. Hebb (1947).

When exposed to virtual environments, children receive information mainly through sight and sound, which they cannot process effectively at a young age. This lack of information from other senses like touch, smell, taste, and balance can hinder their brain development. The emotional bond between a parent and child, crucial for feeling safe and confident, grows gradually, especially during the first two years (Passarello et al., 2022). Attachment security is vital in shaping personality and behavior, with early childhood attachment issues stemming from inadequate parental care. The intellectual and emotional growth of children is complex and influenced by both genetic and non-genetic factors (Pagani et al., 2010). Recent studies have shown that environmental factors significantly impact child development, highlighting the importance of early childhood experiences in the growth and maturity of the nervous system.

Bruno Bettelheim's studies in 1967 on the parent-child relationship as a cause of autism pointed to the impact of colder parental relationships on psychological issues. These problems show up as emotional, cognitive, and language development issues. Although this is controversial, further research has supported the link between parental care and child development, stressing that time spent on emotional interactions is crucial for a child's emotional growth (Balan, 2018).

5. CAUSES OF VIRTUAL AUTISM

The excessive use of screens, encompassing smartphones, tablets, computers, and television, is increasingly recognized as a significant risk factor contributing to developmental challenges among toddlers, often termed "virtual autism." This phenomenon is exacerbated by reduced real-world interactions and limited physical play, particularly within nuclear family settings.

A UNICEF-sponsored report, drawing on research from CGWC-IMHANS, reveals that autism spectrum disorder (ASD) affects approximately 2.34 percent of children aged four to six years in the Kashmir valley. These statistics underscore the urgent need for targeted interventions and awareness initiatives to address the emerging issue of virtual autism in this region (Bashir, 2023). Healthcare professionals advocate for collaborative efforts involving educators and parents to formulate strategies that balance the benefits of technology with its potential developmental risks to young children. The findings from the CGWC-IMHANS report should serve as a pivotal reminder to authorities and caregivers alike to prioritize comprehensive development and mental well-being amidst the evolving digital landscape (Bashir, 2023). As screens have integrated into everyday routines, they are frequently used to soothe children during activities like meals, travel, and exercise, potentially increasing the risk of virtual autism. The COVID-19 pandemic has also seen a rise in cases where children exhibit behaviors resembling autism, often noticed by educators. Excessive use of media and devices has been associated with children's attention span challenges. (Express News Service, 2024).

6. RESEARCH QUESTIONS

The research paper addressed the following research questions:
➢ How does the amount of time that young children spend on screens relate to the showing of behaviors like Virtual Autism?
➢ What kinds of screen activity (such as media or video games) affect how Virtual Autism behaviors will develop in a child?
➢ What ways effectively lower the risk of Virtual Autism from too much screen time in young children?
➢ How do activities like playing with parents stop or slow down the symptoms of Virtual Autism?

7. RESEARCH OBJECTIVES

The following research objectives were supported by the research questions:
➢ To study how screen time affects virtual autism.
➢ To evaluate strategies for mitigating virtual autism risks.

8. RESEARCH METHODOLOGY

The research used an exploratory design to study the relationship between screen time and Virtual Autism. The study intended to research

new concepts and lay a foundation of hypotheses for future studies. This would be a case study approach, and it would facilitate the collection and analysis of data to derive an insight into Virtual Autism among children. Specifically, how screen time relates to Virtual Autism and if there are good strategies that reduce this bad trend. For Objective 2, data was collected through a questionnaire administered to parents of pre-primary level children, with their consent, to gather insights into their perceptions and practices regarding screen time management and its impacts on Virtual Autism.

9. FINDINGS AND OUTCOMES

i. To study how screen time affects virtual autism the following case studies have been reviewed:

Case 1: Robin thought she was doing her best as a mother by preparing delicious meals and keeping her Midwestern U.S. home neat while her toddler son quietly watched TV shows made for babies nearby. She didn't realize, however, that this frequent screen time was contributing to a newly recognized condition called "Virtual Autism." Robin started noticing changes in her 14-month-old son, like decreased eye contact, delayed speech, and new autistic-like behaviors such as hand-flapping, spinning, and not responding to his name. Suspecting that his increased screen time especially watching CoComelon during the COVID lockdowns might be the cause, she began researching and discovered information about Virtual Autism. After she eliminated screen time, she observed immediate improvements: her son started waving again, became more clingy, and made better eye contact. Over the following months, Robin worked diligently on his developmental skills, using the M-CHAT toddler screening questionnaire as a guide. With the help of speech therapy, her son's language skills eventually reached age-appropriate levels. Robin realized that removing screens improved their daily presence and engagement, and she understood that screens had been more of a crutch than a help. She now warns other parents that heavy screen use, which has become quite normalized, can be harmful—comparing it to outdated misconceptions about lead paint and asbestos. As Robin expects her second child, she

shares her experience to raise awareness about the potential dangers of excessive screen time and advocates for proactive measures to ensure healthy child development **(Jenifer, 2024)**.

Case 2: Martha discovered that her nearly 3-year-old son had Virtual Autism due to excessive screen time. She noticed that he had reduced eye contact, lacked speech, and exhibited repetitive behaviors. Realizing these issues coincided with his increased TV watching during the COVID lockdown, she swiftly cut down on his screen time, which resulted in improved sleep and eye contact. Martha then enrolled him in a screen-free daycare and engaged him in meaningful activities at home, such as talking, playing, and reading. Although she hadn't started therapy yet, Martha recognized its potential benefits and remained committed to her son's recovery. She understood that the time it took to see full improvements might match the length of his screen exposure. Overcoming feelings of guilt, she focused on providing a supportive and interactive environment, hoping for steady progress. Martha underscored the importance of parental involvement in addressing Virtual Autism **(Jenifer, 2024)**.

The cases above illustrate that today's children are exposed to electronic media far more than previous generations. This increased screen time is linked with changes in brain function that can lead to abnormal behaviors and impairments in cognitive and language development. Children often receive limited sensory input (primarily visual and auditory) from virtual environments, which makes it difficult for them to connect these with other senses like vestibular (balance), tactile (touch), olfactory (smell), and gustatory (taste). Without early intervention (before the age of 2-3 years), these sensory integration issues can become increasingly severe, hampering their overall development. Using screens as digital pacifiers during meals, travel, or to alleviate boredom can unintentionally worsen this issue. Such reliance on screens limits children's exposure to diverse sensory experiences that are crucial for their development. As a result, their ability to integrate various types of sensory input may be impaired, potentially leading to more pronounced developmental issues. The diagram in Figure 2 explains this concept more clearly:
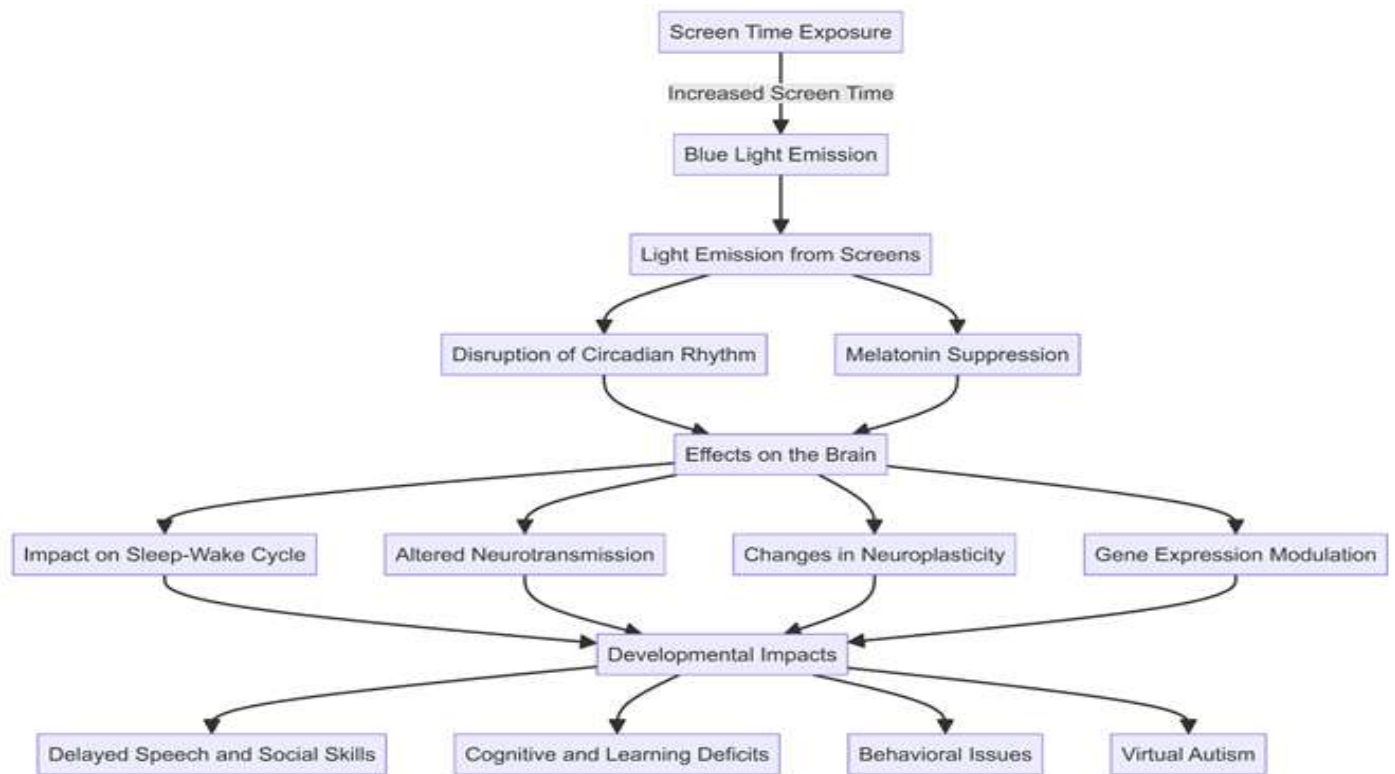
Fig-2: Effect of Screen Time on Virtual Autism

This diagram illustrates how increased screen time leads to blue light emission, disrupting circadian rhythms and suppressing melatonin. These changes affect the brain's sleep-wake cycle (regulation of sleep patterns), neurotransmission (communication between neurons), neuroplasticity (the brain's ability to reorganize itself), and gene expression (the process by which information from a gene is used to synthesize functional gene products), potentially resulting in developmental impacts such as delayed speech, cognitive deficits, behavioral issues, and virtual autism in young children.

10. ARE SOME SCREENS WORSE THAN OTHERS?

Although traditional television is less interactive and more controllable than modern digital devices, it still poses risks if used excessively. For very young children, even the relatively predictable and controlled environment of television can limit sensory experiences and reduce opportunities for interactive play, which are essential for healthy development. However, the stationary nature and easier regulation of television make it somewhat less problematic compared to more interactive devices. Tablets and smartphones, being highly portable and interactive, pose greater risks for young children. Their constant access to a vast array of digital

content can significantly contribute to behaviors associated with Virtual Autism. The interactive and immersive nature of these devices can intensify the sensory deprivation experienced by children, as they primarily engage with visual and auditory stimuli while missing out on crucial tactile, vestibular, and other sensory experiences **(Aplesset, 2023)**.

11. YOUTUBE AND INSTAGRAM: CHALLENGES FOR YOUNG CHILDREN

YouTube: YouTube's algorithm can trap children in a cycle of endless video watching, reducing the time spent engaging in other sensory activities. This constant visual and auditory stimulation can exacerbate issues related to Virtual Autism by diminishing exposure to diverse sensory experiences needed for healthy brain development. The wide range of content on YouTube includes videos that may be inappropriate or overstimulating for young children. Exposure to such content can lead to behavioral changes resembling Autism Spectrum Disorder (ASD), such as reduced interaction and increased repetitive behaviors. Although educational content is available, much of YouTube's material lacks substantive educational value. Prolonged exposure to non-educational or low-quality content can further impair cognitive

and language development, aligning with the symptoms of Virtual Autism.

Instagram: Instagram's focus on curated images and short videos can create unrealistic standards and pressures. For very young children, exposure to such content can disrupt emotional development and lead to behaviors consistent with Virtual Autism, such as withdrawal and increased anxiety. Despite some content moderation, Instagram still exposes children to a broad spectrum of user-generated material. The potential for encountering harmful or inappropriate content increases the risk of developmental issues, including those associated with Virtual Autism. Instagram's design encourages frequent use through features like likes and comments, contributing to addictive behaviors. Excessive screen time can lead to sensory deprivation and disrupt the balance of sensory experiences necessary for healthy development, further aggravating Virtual Autism symptoms.

ii. To evaluate strategies for mitigating virtual autism risks, a questionnaire has been provided to the parents of children at the preprimary level. 20 parents were selected; 10 from families where both the mother and father work, and 10 from families where only one parent works. The following questions were asked of the parents:
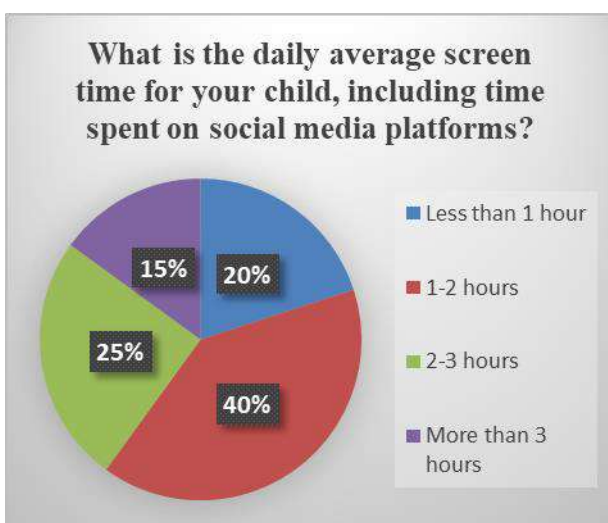

Fig-3:*The majority of parents (60%) report that their children have 1-2 hours or less of screen time daily. This suggests that limiting screen time to under 2 hours may be beneficial in reducing the risk of virtual autism.*
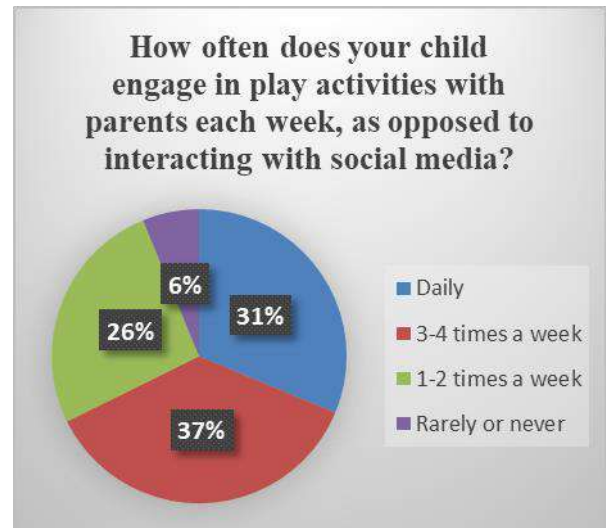

Fig-4:*Most parents (65%) indicate that their children engage in play activities with them at least 3 times a week. Regular interactive play with parents appears to be a key strategy in mitigating the effects of excessive screen time.*
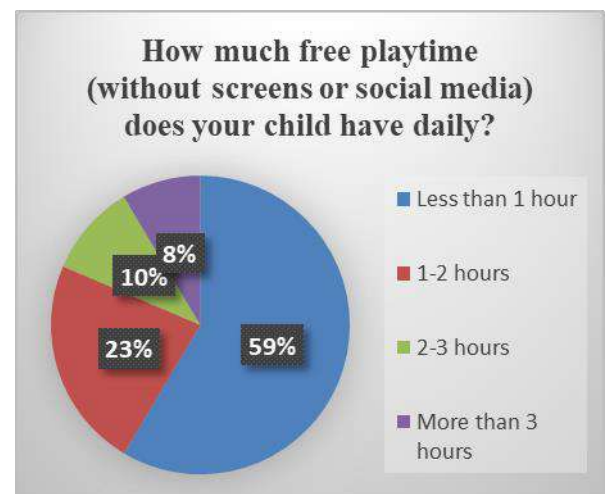

Fig-5:*Most parents (85%) reported that their children have at least 1-2 hours of free playtime daily without screens. Promoting free playtime without screens for at least 1-2 hours daily is another effective strategy.*
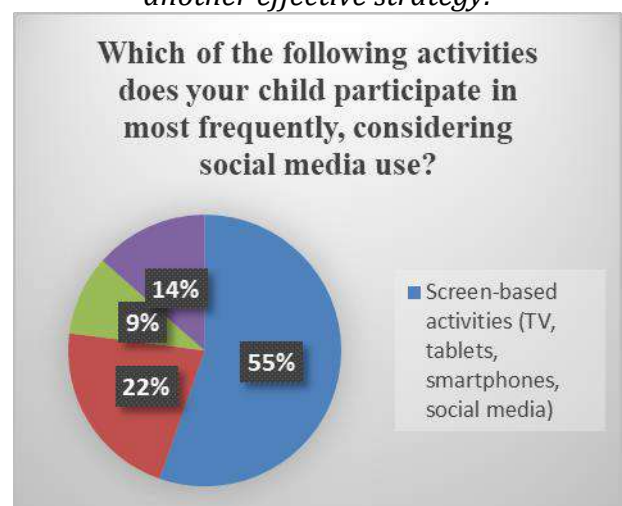
Fig-6: *While screen-based activities are the most frequent, a significant number of children also engage in outdoor play and reading. Balancing screen time with outdoor and creative activities is crucial for mitigating virtual autism risks.*
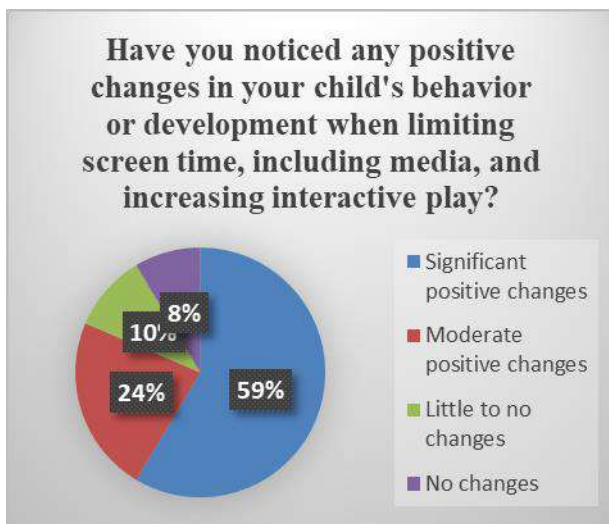

Fig-7: *A majority of parents (82%) observed either a significant or moderate reduction in ASD-like symptoms when screen time was limited, and interactive play was increased. This indicates that reducing screen time and increasing interactive play can effectively mitigate symptoms of virtual autism.*

12. BEHAVIORAL SIGNS OF VIRTUAL AUTISM

Virtual Autism is a term that describes behaviors in children that resemble those found in Autism Spectrum Disorder (ASD), which may be linked to excessive screen time. Here are some behavioral signs that might suggest virtual autism:

➢ *Hyperactivity*: Children may display unusually high levels of activity and restlessness.
➢ *Short Attention Span*: Difficulty maintaining focus on tasks or activities.
➢ *Irritability*: Increased irritability and frequent mood swings.
➢ *Difficulty with Interactions*: Challenges in engaging and interacting with peers and adults.
➢ *Delayed or Impaired Language Development*: Slower development of language skills, including vocabulary and speech.
➢ *Repetitive Behaviors*: Engaging in repetitive motions or routines similar to those seen in ASD.

It's important to note that these behaviors often improve or even disappear when screen exposure is reduced or eliminated, suggesting a significant link between excessive screen time and developmental issues in children. Recognizing these signs early can be crucial for parents and caregivers, as reducing screen time may lead to noticeable improvements in behavior and development.

13. NEGATIVE HEALTH OUTCOMES

Excessive screen time in young children is associated with several negative health outcomes, which can include:

➢ Decreased Cognitive Ability: Prolonged screen exposure can impact brain development and cognitive functions.
➢ Impaired Language Development: Language skills may develop more slowly due to reduced face-to-face interaction and engagement.
➢ Mood Issues: Increased likelihood of mood swings and emotional instability.
➢ Autistic-like Behavior: Behaviors such as hyperactivity, short attention span, and irritability that are similar to those seen in children with ASD.

The potential impact of excessive screen time on young children's health and development is a growing concern. While more research is needed to fully understand the long-term effects, there is evidence to suggest that reducing screen time can help mitigate these negative outcomes.

14. PROMOTING HEALTHY DEVELOPMENT

Parents and caregivers play a critical role in fostering healthy development in young children by managing screen time. Striking a balance between screen exposure and other activities is essential for promoting cognitive, and emotional growth. Encouraging activities that involve physical play, interaction, and hands-on learning can support a child's overall development. By being aware of the symptoms and potential impacts of virtual autism, parents can take proactive steps to create a healthier environment for their children, ensuring they have ample opportunities to develop the skills necessary for a well-rounded childhood. To effectively limit the time children spend in front of TVs, tablets, computers, and mobile phones, parents should adhere to the following strategies:

➢ *Create a Daily Schedule*: Develop a daily schedule with the child, ensuring a balanced routine that includes various activities.

- ➢ *Establish Usage Rules*: Set clear rules for the use of the TV, computer, and phone by the child.
- ➢ *Remove Gadgets from Sight*: Keep gadgets out of the child's visual contact to reduce temptation.
- ➢ *Offer Rewards*: Provide rewards when the child respects the daily schedule, reinforcing positive behavior.
- ➢ *Build an Exciting Play Area*: Designate a special place in the house with engaging and exciting things that can be used when the child gets bored and wishes to play on the tablet, redirecting their focus to new activities.
- ➢ *No Gadgets During Homework*: Ensure the TV and computer are turned off while homework is being done to maintain focus.
- ➢ *Select Content Wisely*: Choose TV shows and computer games with discernment, opting for educational and age-appropriate content.
- ➢ *Promote Physical Activities*: Emphasize the importance of physical activities and walking, which have a significant impact on the child's emotional and physical development.
- ➢ *Emotional Health and Physical Activities*: Emotional health is crucial for a child's development and can be greatly enhanced through movement and sports. Sports activities help children grow physically, mentally, and emotionally. They stimulate interactions and teach important life skills such as patience, responsibility, respect for others, accountability, and adaptability. Engaging in sports also provides opportunities for children to make friends of the same age with similar interests, fostering connections and shared passions.

15. CONCLUSION

This research paper provides insight into a complex relationship between the developments of Autism Spectrum Disorder (ASD)-like behaviors, often termed Virtual Autism, and an increase in time spent in front of screens in young children. More intensive exposure to digital screens during these critical developmental phases led to a negative impact on cognitive, motor, and language development. Importantly, Robin and Martha's stories illustrate how parental intervention, such as reduced screen time and increased interactive play, can significantly improve developmental outcomes.

This study revealed that screen activities do not equally impact children. Interactive digital devices, such as smartphones and tablets, in conjunction with certain websites like YouTube and Instagram, are particularly risky because their interactivity is engaging and more immersive than static broadcast content. Using these devices and platforms often restricts the necessary sensory experiences beyond audio-visual input, leading to deficits in development mirroring those seen in classic Autism Spectrum Disorders. The study indicated that strategic interventions needed to be in place to buffer the risks associated with the development of Virtual Autism. Strategies like promoting free play, limiting screen exposure, and having more parent-child interactions are effective in counterbalancing the negative effects of screen time.

These strategies, combined with knowledgeable parental guidance and societal support, create a more benign environment for child development. Virtual autism has effects beyond just the family and should be a matter of interest for educators, policy-makers, and health practitioners. Given the universal nature of technology in present-day society, future research interests must explore the potential long-term effects of this screen exposure while also finding new ways to create balance in this digital age. In conclusion, this research highlights that digital media carries with it several advantages and conveniences, but screen time needs to be managed responsibly to safeguard children's health. Through the adoption of healthy developmental practices as a priority, and with the realization that there may be potential dangers to be avoided relative to Virtual Autism, society can already actively care for and contribute to this crucial proactive effort.

How should parents and caregivers balance taking advantage of technology for educational purposes and mitigate the potential risks it poses to child development? How does that change with technology slowly getting integrated into our lives, and what are the specific measures and strategies that need to be adopted by parents in order to avoid a situation where screen time can hamper their growth both cognitive and emotional? Factoring in the stated issues within the society, what then should policymakers and the education institutions be

expected to do within the regulations that control the issue of screen time for children? How shall the creation of access to development activities ensure holistic growth, and how can community-based initiatives and government policies sufficiently reach and support all families regardless of their economic backgrounds? Virtual Autism is a serious issue, emphasizing how the amount of screen time has an impact on children's development and why it is so important to learn a balanced approach to media.

Reflecting upon the following questions, readers are not just called on to think about their role in limiting the risks of excessive screen exposure but are to find practical ways that help children accomplish healthier developmental outcomes. Technology is changing constantly, and our understanding and supervision of its effects on young minds must evolve with it. This makes it very important for parents, educators, policy-makers, and technology companies to work in unison to develop a safe and healthy environment for digital interaction. This issue can be prevented, by making proactive efforts and informed choices so as not to compromise the developmental health of future generations and to ensure that technology becomes a tool for positive growth but not a barrier against growth. Avoiding Virtual Autism is everyone's responsibility, and collective efforts and awareness are needed to arrive at a feasible solution. It is through such thoughtful consideration and action that we can navigate the complexities of our digital age to ensure that children reach their potential both online and offline.

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