DEVELOPMENTAL DELAY IN CHILDREN ASSOCIATED WITH SCREEN TIME

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ABSTRACT

Children today are surrounded by both traditional and cutting-edge digital media worldwide. Children's daily life now includes screen time starting as early as infancy. Preschoolers exposed to interactive and screen media may benefit in a variety of ways, but excessive or unsuitable screen time may offer health and developmental hazards. The environment, including parents, siblings, and classmates, has a major effect on children's development. More than ever before, children are absorbing video and internet gaming content. Approximately one hour every day is spent engaging with and observing digital screens. Children Received on : 02-04-2023 Accepted on : 15-05-2023

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are interacting with screens more frequently every day as virtual learning approaches are adopted more frequently in classrooms. Even while screen time is a necessary part of life at home and at school, keeping track of how much time your child spends using screens is crucial for their general development. To encourage healthy development in this digital age, In order to promote in-person play and physical exercise among preschoolers, parents and caregivers must endeavor to reduce screen-based activities.

KEYWORDS: Media, Screen Time, Developmental Delay, Pediatrics, Children.

INTRODUCTION

Digital media use has dramatically increased throughout the world. Children today are exposed to information and amusement on screens, and it has permeated every aspect of their life. Children in the United States between the ages of 0 and 8 spend more than 2 hours per day in front of screens (1). The average daily screen time (ST) for kids in western India between the ages of 2 and 6 is 2.7 hours. (2). It is crucial to assess the effects of ST during this time since children's social and intellectual development is malleable throughout this time (3).

In addition to its psychosocial effects, excessive ST has been linked to developmental delays in language and motor skills (4, 5) children under the age of five are advised by the American Association of Pediatrics. (6). However, these recommendations have come under fire for not being supported by data (7), and systematic reviews have revealed conflicting results about the impact of ST While there is some data on how ST affects development from developed Western countries, there is a dearth of evidence from low- and middle-income nations (8). The majority of the evaluation of ST in the current studies is dependent on

caregivers' memories, which are vulnerable to prejudice. Additionally, the majority of ST research relies solely on data from pre-school, clinic, and hospital records related to immunizations and wellchild visits, without population-based studies examining how children mature at home. Numerous schools have been closed as a result of the 2019 coronavirus disease epidemic, and more students are choosing to learn online. Studies are required to create recommendations for kid-safe ST limits that are based on facts. (9).

DRAWBACKS OF TOO MUCH SCREEN TIME

Approximately one in four school-age children have developmental delays or impairments, such as communication difficulties, language issues, poor motor skills, and emotional deficiencies, according to scientific literature. One of the major risk factors that could potentially impede a child's early developing processes is excessive screen usage. Such developmental delays might hinder a child's academic progress and have a substantial negative impact on the learning process. The American Academy of Pediatrics recommends limiting a child's daily screen use to no more than an hour between the ages of 2 and 5. Similar to this, it's best to minimize screen time for kids less than 18 months (10). Nowadays, screens and digital media are a part of every child's life. Nearly 98% of US kids between the ages of 0 and 8 have access to the internet at home, and they use screens for more than 2 hours each day on average 7 hours (11). According to a new National Institutes of Health study, kids who spend about two hours per day in front of screens have weaker language processing and thinking skills. Additionally, the research revealed that youngsters who spend more than 7 hours each day in front of a screen experience thinning of the reasoning and critical thinking cortex (12).

Similar findings were made in a another study with 2441 kids aged 2 to 5 years, which discovered that kids who spend too much time on screens between the ages of 2 and 3 do poorly on developmental screening tests (13).

The pediatric recommendation that youngsters watch no more than one hour of high-quality TV per day is exceeded by this amount (14, 15). Although there are some advantages to engaging in high-quality, interactive screen time, there are a number of detrimental physiological, behavioral, and cognitive impacts that have been associated with excessive screen usage. (16, 17, 18, 19). The study also discovered that a number of variables, including the family's economic situation, mother depression, the child's sleep habits, gender, exposure to reading, and degree of physical activity, have an impact on screen exposure and performance quality. One of the top brain researchers in the world. Patricia Kuhl conducts research on more than 4,000 infants annually. She points to multiple brain scans on a computer and adds, "What we've found is that little babies, under a year old, do not learn from a machine." "Even when you show them interesting videos, the learning difference is astounding. A real person can teach you brilliant things, but a machine cannot teach you anything. This could be the reason why the (WHO) World Health Organization recommends against screen time for new-borns under the age of two and against allowing children between the ages of two and four to spend more than an hour per day on screens. (20, 21).

CHILD'S OVERALL DEVELOPMENT IMPACTED BY SCREEN TIME

Young children, especially those under the age of three, have extraordinarily rapid growth in their physical, Behavioral, emotional, and cognitive abilities. In general, kids pick up knowledge from their surroundings through watching adults especially their parents at work. Overuse of screens can dramatically reduce a child's opportunity to engage in unique daily activities, which can result in a reduction of their overall interests in non-screen-related topics and facts. In other words, a youngster who spends a lot of time in the virtual world on screens typically has less free time for play, exercise, and real-life interactions with friends and family. The whole growth and development of a child may be profoundly impacted by this. (13, 22).

BEHAVIOURAL ISSUES: More than two hours a day spent on a smartphone, computer, video game, or television increases the risk of social, emotional, and attention problems in elementary school pupils. Additionally, children who play video games have an increased risk of developing attention problems.

ACADEMIC PERFORMANCE IS AFFECTED: those in elementary school who have TVs or other devices in their rooms often perform worse on examinations than those who don't.

VIOLENCE: Excessive media exposure to violence might desensitize young people to it. As a result, kids could come to accept using violence as a common strategy for resolving conflicts.

LACK OF PLAYTIME: Too much screen time prevents children from engaging in active, imaginative play. Screen usage for your youngster may be more frequent than you thought. Start keeping an eye on it and discussing the value of moving around more and sitting less with your child's. Also, describe the restrictions on screen time and the repercussions of breaking them. (23)

LANGUAGE EFFECTS: It is common knowledge that kids learn new words while interacting or playing with adults, which is important for language development. A child's language development benefits substantially more from a two-way conversation with adults that includes both facial expressions and emotional input than it does from a one-way engagement with screens. Children who use screens the most frequently typically have poorer levels of attention and concentration and do worse on reading exams, according to studies (24).

IMPACT OF SLEEP DUE TO ST: Importantly, excessive exposure to blue light from screens can prevent you from falling asleep by preventing the release of melatonin, which is a hormone that promotes sleep. As a result, a child's cognitive development may be hampered. Studies show infants aged between six and twelve months who are exposed to screens a lot in the evening may have trouble falling asleep at night. (25)

According to another study, Children who watch screens more frequently are more likely to have trouble falling asleep or to have irregular sleep patterns. Sleep deprivation might make you weary and increase your snacking.

EMOTIONAL IMPACTS: A child's emotional behaviour can be modulated in a variety of ways by excessive screen usage. Their ability to be creative and motivated may be restricted by an overreliance on digital media. Children are less frequently able to be delighted by individuals in the immediate area due to the growing screen addiction, which eventually might lead to irritation, anxiety, and impulsive actions.

The ability of a youngster to recognize facial expressions and develop social skills may also decline as a result of excessive screen time, which may have an effect on Overall empathy of the kids. Continuous exposure to On-screen videos or graphics that move quickly can have a negative effect on a child's concentration and attention level, in contrast to reading a book where a youngster has ample time to understand the meaning of the words or visuals. (26)

All communication is non-verbal, therefore youngsters rely largely on gazing at a face and extrapolating meaning from it, according to Harvard neurologist Charles Nelson, who investigates the effects of neglect on children's brains. Are they pleased with me or are they angry with me? The two-way communication between kids and their adult carers is crucial for brain development. Babies' capacity to understand and regulate their frustration is diminished by screen exposure. Additionally, it interferes with activities like play and social interaction with other kids, which strengthen children's brains. However, if you must use screens occasionally, be sure to manage the content kids see and interact with them while they are using them. Limiting or even banning screen use in these formative years will have long-term positive effects. (27).

OBESITY: Your youngster is more likely to get overweight if they watch more TV and videos. This risk increases if a child's bedroom contains a TV or other technology. Children may also become attracted to the junk food that is advertised in advertisements and overeat when using electronics. (28) On screens, people of all ages can discover fascinating material. This is because their brains process sensory information as though it was actually happening to them, and they act accordingly. When watching a movie, people frequently feel emotions like laughter, tears, or astonishment. The same level of engagement is possible when someone plays a video game.

When a person is playing a video game, their brain creates a simulation of the real world. If there is a dangerous or hostile situation in the game, the player's body reacts properly. The exposure to the tremendous stimulation and violence in the game sets off this "fight-or-flight response" to that perceived danger. Overuse of video games can cause the brain to become constantly stimulated and hyperaroused.

Each person's hyperarousal manifests itself differently. It may include issues with focus, mood regulation, impulse management, directive following, and putting up with frustration. Some people, whether they be adults or kids, have trouble expressing their compassion and inventiveness, and they show less enthusiasm in learning. This could result in a lack of empathy for other people, which might result in violence. Additionally, children who engage with others through screens and social media tend to experience loneliness more so than children who interact in person.

Physical symptoms of chronic hyperarousal include low immunological function, irritability, jitteriness, melancholy, and unstable blood sugar levels. While playing video games, some kids may start craving sweets. Children's diets and weight can suffer as a result of gaming, especially when combined with how sedentary it is. Sometimes kids won't even stop playing the game to use the bathroom, which might cause hygienic problems. (29).

Developmental learning abilities can be shaped or unshaped by early experiences (30). The World Health Organization and several national pediatric societies advise parents to limit preschoolers' screen time to no more than one hour each day, although very few families in North America really do this. For instance, Lee et al. found that just 15% of the 151 preschoolers in their sample followed the advised screen time guidelines. (31, 32, 33). The quality of screen use, particularly the context (such as co-viewing) and content (such as educational programming), may have a differential impact on development, according to research in preschool-aged children, which suggests that the amount of screen time is probably consequential for children's developmental health (34, 35). For instance, Carson et al. showed that having more screen time than is advised at the age of 36 months was linked to an increase in behavioral problems (36). Madigan et al. (37) further confirmed the directionality of the association between screen time and child developmental outcomes: higher levels of screen time at 24 and 36 months of age were associated with delays in attaining developmental milestones at 36 and 54 months, respectively. The 1 hour per day suggestion is still often criticized for not having enough evidence to back it up, which may lead to a decline in its uptake.(38). If there is a doseresponse association between the amount of hours spent in front of a screen and child outcomes that is consistent with the guidelines of no more than one hour per day for children ages 2 to five, that is an urgent problem in the field of pediatrics (31). It is especially important to carry out this work with preschoolers since research shows that once patterns of screen usage behaviors are established, they tend to become more embedded over time. (39, 40) In the past, screen time was often assessed as a continuous variable or as meeting or surpassing standards. (36, 37, 41) It is vital to get a better understanding of the child development outcomes connected to > or 1 h/day of screen time in order to support or refute current guidelines and to encourage the adoption of screen time recommendations. Recent studies show that preschoolers (ages 1-3) in North America utilize screens on a daily basis between 0 minutes and 3.3 hours. (31, 39).

DISCUSSION

In our study, children aged 24, 36, and 60 months watched television on average for 17, 25, and 11 hours per week, equating to 2.4, 3.6, and 1.6 hours of screen time each day, respectively. This sample's level of screen time is comparable to that reported in a recent study (11) which found that children in the US watch 2 hours and 19 minutes of television on average every day. The reduction in screen time is impressive even though it would not affect cross-lag analyses that contrast mean change vs. rank-order stability at 60 months. It could be attributed to the fact that the kids in our cohort began primary school at age 5 and that before- and after-school care began at that age, which resulted in less time spent at home and a natural decline in screen time.

A child's first five years of life are a period of rapid development. The current study indicated that children's potential for healthy development can be impacted by screen use. The study examined developmental outcomes during a critical stage of growth and maturity. Children who are glued to screens may miss out on important opportunities to advance their social, physical, and communication skills. Children who watch non-interactive or physical media become more sedentary and less likely to engage in gross motor skills like walking and running, which could hamper their development in this area. Screens can also harm interactions with caregivers by limiting opportunities for verbal and nonverbal social exchanges, which are essential for fostering the best potential growth and development (42, 43, 44). Corresponding to theoretical frameworks describing the many influences on growth in a multilayer

ecological system. (45). We discovered that a range of individual-level and contextual factors, including gender, family income, mother depression, sleep patterns in children, and frequency of reading aloud to children, were associated with both screen usage and performance on developmental screening tests. Collectively, these findings suggest that a number of variables may have an impact on a child's propensity for excessive screen time. It's likely that not all children are affected by screen time in the same ways, though. There might be factors that lessen the negative effects of screen time on a child's development. Future longitudinal research examining the differential susceptibility (46) of children to screen time exposure, as well as risk and protective factors (47), will be crucial to determining when and for whom screen time is particularly harmful to child development.

This study offers various suggestions and practical repercussions. First, experts should emphasize the need for moderation in screen time and the importance of caregiver-child relationships that are free from technology interruption for a child's growth (48). Second, paediatricians and other health care professionals are recommended to develop individualized media plans with families or direct them to resources to construct media plans in order to ensure that screen use is not excessive or obstructing face-to-face interactions or family time (49). Media techniques may need to be changed to better meet the demands of each household. The plans provide guidance on how to establish screen-free zones and device curfews in the home, how to establish rules and boundaries surrounding media use depending on kid age, and how to balance and allot time for online and offline activities to ensure that family time and physical activity are prioritized.

LIMITATIONS

It takes longitudinal research methods to draw findings on the directionality and patterning of associations over time and across developmental stages. One of the major problems for longitudinal studies using screens is that technology development is progressing swiftly and outpacing research. (50) Between October 20, 2011, and October 6, 2016, data were collected in our large prospective cohort, which monitors children between the ages of 24 and 60 months. Due to technological advancements, it's probable that screen time habits have changed during this time. The fact that the first evaluation of the study variables was done after 24 months is another potential drawback. Future studies could find it useful to include an extra data lag of 12 or 18 months to further bolster the pattern of findings seen here. Given recent

indications that screen time in infancy is increasing, the inclusion of earlier lag data may be particularly relevant (11, 51).

The monodimensional focus on screen time is a third restriction. The impact of media content quality (such online video streaming in contrast to educational apps) has on the development of children should be broken down in future studies. Another flaw is the use of maternal reports to examine the link between screen use and child development. Other family members don't have to carry as much of the study burden when maternal reports are gathered by questionnaire measurements from large participant samples and, as a result, can reduce attrition. The possibility of common-method variance bias is introduced by within-informant techniques, though. On the ASQ-3, parents and professionals had strong interobserver reliability. (52) In order to test for developmental delays, the ASQ-3 (Ages & Stages Questionnaires) is probably an appropriate evaluation method. By gathering maternal and paternal opinions about early child outcomes, reporting bias may be less likely to occur in future studies. In order to independently verify the findings of the current research using a multi-informant approach, future research may consider using monitoring apps on devices to observe user behavior when it comes to screen time.

CONCLUSION

In current high-digital consumption era, children are frequently and easily exposed to media gadgets because of how dynamic the digital world is. This study demonstrates a relationship between preschoolers' screen use and behavioral, developmental, and linguistic measures. Children who watch two to three hours of television each day are more likely than those who watch less than an hour to have at-risk behavior problems, delayed language development, and developmental milestone delays. The vast majority of the research analyzed demonstrate that more screen time and early commencement of viewing had detrimental impacts on language development, Especially for young toddlers under two, delayed viewing onset has shown some benefits. Video characteristics, content, and cowatching have an impact on language development as well. By capturing maternal and paternal opinions about early child outcomes, future research could reduce the likelihood of reporting bias. In order to corroborate the results of the current study, future research may use tracking applications on devices to unbiasedly observe screen time behavior using a multi-informant method.

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