Excessive screen time, autism-related symptoms, and treatment outcomes: What does research say?

With the rise of digital devices, many parents and clinicians are understandably concerned about how this exposure may impact a child's development, particularly regarding autism spectrum disorder (ASD). Autism is a condition that affects how children communicate and interact socially, making it crucial to explore any factors that could influence its onset and severity.

We have researched the latest findings regarding screen time and autism, and compiled a list of the latest evidence to help you make informed decisions.

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Studies linking screen time to autism

1. Does Television Cause Autism?

This paper shows that early childhood television viewing is an important trigger for autism. Using data from the American Time Use Survey, researchers first found a surprising link between the amount of television young children watch and the amount of rainfall in their area. Their findings showed that in areas with more rain, autism rates were higher. They also looked at the percentage of households with cable television and results indicated that the rise in cable TV subscriptions was linked to an increase in autism diagnoses. Specifically, results show that just under forty percent of autism diagnoses are the result of television watching due to precipitation and approximately seventeen percent of the growth in autism in California and Pennsylvania during the 1970s and 1980s is due to the growth of cable television.

Waldman, M., Nicholson, S., & Adilov, N. (2006).

2. Comparison of television viewing between children with autism spectrum disorder and controls

This study shows that children diagnosed with ASD began to watch television significantly earlier than children not diagnosed with ASD, respectively at around 6 months of age, prior to the development of their receptive and expressive language. Regarding the frequency of television viewing, those with ASD spent significantly more time watching television than children not diagnosed with ASD.

Children with ASD were more likely to watch adult programmes including advertisements, TV series, news, games, entertainment shows and music videos than children not diagnosed with ASD. Furthermore, children with ASD were more likely to be allowed to watch television on their own.

Therefore, the onset of television use at approximately 6 months of age may be an indirect clue for social and/or language deficits in those who are at risk of ASD.

Chonchaiya, W., Nuntnarumit, P., & Pruksananonda, C. (2011).

3. Causation Model of Autism: Audiovisual Brain Specialization in Infancy Competes with Social Brain Networks

While genetics play a role, studies indicate that environmental factors, including exposure to screens, may also contribute to the development of autism spectrum disorder (ASD).

As more audiovisual (AV) content has become available, we've seen an increase in screen time for infants. Children are naturally drawn to engaging AV materials, but they may not understand these experiences as social interactions.

This study proposes a model where excessive screen exposure in genetically vulnerable infants may lead to a focus on non-social processing in the brain. This shift can interfere with the development of social skills and contribute to broader developmental delays. This model helps explain why some children with ASD may struggle with recognizing faces and understanding speech, preferring to watch screens instead of interacting with people. It also sheds light on the unique abilities some children with ASD have in areas like visual and auditory processing.

Importantly, the model suggests that early intervention can have positive effects.

Heffler, K. F., & Oestreicher, L. M. (2016b).

4. The consumption of virtual environment more than 4 hours/day, in the children between 0-3 years old, can cause a syndrome similar with the autism spectrum disorder

This study looked at two groups of children: children diagnosed with ASD who spent more than four hours a day in virtual environments (such as screens) between ages 0-3, and children diagnosed with ASD who did not. The findings revealed that children diagnosed with ASD who had high screen time during those early years showed a faster recovery in their QD/IQ, respectively a 37% higher QD/QI from their first to second psychological evaluation, needing three times less support compared to the other group.

This suggests that children with ASD who spent an average of more than four hours a day in virtual environments responded differently and more positively to therapy compared to those with less screen exposure and points to a possible link between high screen time and behaviors similar to those in ASD. Researchers have termed this phenomenon "Virtual Autism."

Zamfir, M. (2018).

5. Plea for a new syndrome “Early and Excessive Exposure to Screens” (EEPS)

This paper describes screens as a “major environmental disruptor” that can lead to several challenges for children, such as attention disorders, language delays, and difficulties in forming relationships. This happens because screens can overstimulate children and capture their attention in ways that prevent them from engaging deeply with their caregivers and surroundings. Moreover, THE authors suggest that it may be necessary to completely remove screens from a child's environment to help them recover and develop healthier habits.

Marcelli, D., Bossiere, M.-C., Ducanda, A.-L. (2020).

6. Changes in autism symptoms associated with screen exposure: Case report of two young children

This study discusses two young children with autism spectrum disorder (ASD) who had high early-life screen exposure. After their screen time was reduced and replaced with more social interaction with their parents, both children showed significant improvements in their development. However, there was a period when their screen time increased again, which led to a return of some symptoms.

6. Changes in autism symptoms associated with screen exposure: Case report of two young children *(continued)*

The improvements were clear when the children spent less time on screens and more time engaging with their parents. Conversely, their symptoms worsened when they went back to higher screen exposure. One child, in particular, showed significant changes in repetitive behaviors that seemed linked to their screen time changes.

These cases support existing research suggesting that screen exposure can affect how young children with autism respond to therapy.

Heffler, K. F., Frome, L. R., & Gullo, D. F. (2022).

7. Screen time and autistic-like behaviors among preschool children in China

This study aimed to see if there's a link between early screen exposure and behaviors similar to autism in preschool-aged children. Researchers studied 29,461 child-caregiver pairs at kindergartens in Longhua New District, Shenzhen, China and revealed that watching screens at a younger age, spending more time on screens each day, and having more years of screen exposure were all linked to more autistic-like behaviors in preschoolers. Specifically, the first three years of life seemed to be a critical time when screen exposure could increase the risk of these behaviors.

Chen, J.-Y., Strodl, E., Wu, C., Huang, L.-H., Yin, X.-N., Wen, G.-M., Sun, D.-L., Xian, D.-X., Chen, Y.-J., Yang, G.-Y., & Chen, W.-Q. (2020).

8. Early Electronic Screen Exposure and Autistic-Like Behaviors among Preschoolers: The Mediating Role of Caregiver-Child Interaction, Sleep Duration and Outdoor Activities

Researchers gathered data from 29,595 child-caregiver pairs and the results showed that children who had more screen time during their early years were more likely to display autistic-like behaviors as preschoolers. The link was stronger with more daily screen time. Decreased caregiver-child interactions and sleep duration contributed to understanding this connection, but outdoor activities didn't seem to have an impact on the increase of autistic-like behaviors.

Chen, J.-Y., Strodl, E., Huang, L.-H., Chen, Y.-J., Yang, G.-Y., & Chen, W.-Q. (2020).

9. Association of Early-Life Social and Digital Media Experiences With Development of Autism Spectrum Disorder–Like Symptoms

The study found that more screen time and less playtime with caregivers in early life were associated with increased signs of ASD-like behaviors later on.
Results show that among the 2,152 children (about 51% boys), those who watched TV or videos at 12 months showed more signs of ASD-like behaviors by age 2. However, this screen time was not linked to an increased risk of being diagnosed with ASD. On the other hand, children who played with their caregivers daily showed fewer ASD-like symptoms at 2 years old. Interestingly, high screen time at 18 months did not show a significant link to ASD-like symptoms or risk at age 2.

Heffler, K. F., Sienko, D. M., Subedi, K., McCann, K. A., & Bennett, D. S. (2020).

10. Correlation Between Screen Time and Autistic Symptoms as Well as Development Quotients in Children With Autism Spectrum Disorder

The study found that children with ASD spent significantly more time on screens—about 3.34 hours per day—compared to just 0.91 hours for typically developing (TD) children.

Increased screen time in children with ASD was linked to more severe autism symptoms, especially sensory issues, and lower scores in language development. Longer screen time negatively affected various developmental skills, especially language and social abilities. This suggests that excessive screen time might limit children's opportunities for important social interactions and physical play.

Dong, H.-Y., Wang, B., Li, H.-H., Yue, X.-J., & Jia, F.-Y. (2021).

11. Amount of Screen Time and Occurrence of Autistic-Like Symptoms in Toddlers in a Tertiary Care Hospital

These researchers wanted to understand the impact of screen exposure on toddlers, specifically looking at potential links to autism-like traits, and here are their results. A concerning 53% of toddlers who spent more than 4 hours on screens each day were found to be at high risk for developing autism-related symptoms. More screen time was associated with greater signs of autism-like behaviors.

11. Amount of Screen Time and Occurrence of Autistic-Like Symptoms in Toddlers in a Tertiary Care Hospital *(continued)*

Most toddlers in the study were between 12 and 24 months old, and many started using screens around 13 to 24 months. Higher rates of autism-like symptoms were noted in toddlers who watched screens for 3 to 4 hours a day.

Excessive screen time can reduce opportunities for social interaction and imaginative play, which are vital for healthy development. Instead of engaging with toys or playing outside, toddlers may become fixated on screens, limiting their sensory and social experiences.

The study also found that 80% of the toddlers had some interaction with their parents. Those with less interaction were more likely to show autism-like symptoms, emphasizing the importance of parent-child engagement in healthy development.

Dikkala, V. P., Murthy, P. S., Prasad, R. V., Sharma, V., & Chaudhury, S. (2022).

12. Differentiating Post-Digital Nannying Autism Syndrome from Autism Spectrum Disorders in Young Children: A Comparative Cross-Sectional Study

This study aimed to understand the differences between children showing signs of what we're calling Post-Digital Nannying Autism Syndrome (PDNAS), children with autism spectrum disorder (ASD), and typically developing children (TDC). Children with PDNAS are children who showed some signs of autism but had not been diagnosed and spent more than half of their waking hours on screens.

There was no significant difference in the severity of autism symptoms between the children with ASD and those with PDNAS. This suggests that, at a young age, it can be hard to tell the difference between these two groups based on symptoms alone.

Although children with PDNAS share similar symptoms with those who have ASD, they differ in terms of cognitive and behavioral skills.

Pouretemad, H. R., Sadeghi, S., Badv, R. S., & Brand, S. (2022).

13. Autism's Direct Cause? Failure of Infant–Mother Eye Contact in a Complex Adaptive System

This paper discusses a hypothesis that suggests autism may start with challenges in early learning. It proposes that changing the environment where young children learn could significantly reduce the number of autism cases.

The paper suggests that autism may be linked to a lack of early eye contact between infants and their mothers, a problem that could become more common as screen time increases. Understanding how early interactions shape personality could have significant implications for brain science.

McDowell, M. J. (2015).

14. Screen Media and Autism Spectrum Disorder: A Systematic Literature Review

This article reviews the existing research on how screen time relates to ASD. The review analyzed studies up until April 2018 and found that children and teens with ASD tend to spend more time on screens compared to their peers who don't have ASD. This increased screen time often begins at a younger age. The way screens are used—such as whether children are watching alone or with parents—can also influence behavior.

Slobodin, O., Heffler, K. F., & Davidovitch, M. (2019).

15. Screen Time and Autism Spectrum Disorder - A Systematic Review and Meta-Analysis

While the review suggests a possible link between screen use and ASD, the evidence is not strong enough to make definitive claims. Parents are still encouraged to monitor their children's screen time, especially during crucial developmental stages. Ultimately, while the topic is complex and still under investigation, maintaining a balanced approach to screen time can support healthy development in children.

Ophir, Y., Rosenberg, H., Tikochinski, R., Dalyot, S., & Lipshits-Braziler, Y. (2023).

16. Early Screen-Time Exposure and Its Association With Risk of Developing Autism Spectrum Disorder: A Systematic Review

This review looked at existing studies to understand the relationship between early screen time and the risk of developing ASD. Key Findings: the longer a child is exposed to screens, the higher the risk of developing ASD; children who start using screens at a younger age are at an even greater risk compared to those who are exposed later.

Sarfraz, S., Shlaghya, G., Narayana, S. H., Mushtaq, U., Shaman Ameen, B., Nie, C., Nechi, D., Mazhar, I. J., Yasir, M., & Arcia Franchini, A. (2023).

17. Intensive early screen exposure as a causal factor for symptoms of autistic spectrum disorder: The case for «Virtual autism»

Research cited in this article has shown that intensive early screen exposure (watching screens for more than 4 hours a day) can negatively affect children's development in areas like attention, language, emotional regulation, and social skills.

Following a well-known framework for understanding cause-and-effect relationships, researchers now have increasing evidence that excessive screen use at an early age may be linked to symptoms of Autism Spectrum Disorder (ASD) in some children under 6 years old, especially those who might be more vulnerable.

Interestingly, there are also cases where children show significant improvement or even recovery when parents decide to stop allowing excessive screen time for a few months. Instead, they focus on more meaningful interactions with their child and daily one-on-one time without screens, which has been shown to help improve development, with no known harmful side effects.

Harlé, B. (2019).

18. Association Between Screen Time Exposure in Children at 1 Year of Age and Autism Spectrum Disorder at 3 Years of Age

Conducted in Japan with 84,030 mother-child dyads, this study found a significant association between increased screen time at 1 year and a higher likelihood of an ASD diagnosis at age 3, but only in boys.

18. Association Between Screen Time Exposure in Children at 1 Year of Age and Autism Spectrum Disorder at 3 Years of Age *(continued)*

The study revealed that boys who had more than 1 hour of screen time per day at 1 year of age were more likely to be diagnosed with ASD at 3 years. The association was strongest in boys with 2 or more hours of screen time daily, where the odds of ASD diagnosis were more than three times higher. In contrast, no such association was found among girls.

Kushima, M., Kojima, R., Shinohara, R., Horiuchi, S., Otawa, S., Ooka, T., Akiyama, Y., Miyake, K., Yokomichi, H., Yamagata, Z., Kamijima, M., Yamazaki, S., Ohya, Y., Kishi, R., Yaegashi, N., Hashimoto, K., Mori, C., Ito, S., Yamagata, Z., ... Katoh, T. (2022).

19. Early Media Overexposure Syndrome Must Be Suspected in Toddlers Who Display Speech Delay With Autism-Like Symptoms

This article explores a new condition, "Early Media Overexposure" (EMO) syndrome, which links excessive screen time in infancy to speech delays and autism-like symptoms. The authors suggest that early overexposure to media, particularly screen time, can negatively affect a child's social-emotional development, cognitive functions, and behavior, potentially mimicking symptoms of Autism Spectrum Disorder (ASD). One case study is presented where a child, initially diagnosed with speech delay, was found to display autism-like symptoms. Upon investigation, it was discovered that the child had been exposed to extensive screen time, including background television and heavy use of mobile phones, which may have disrupted important family interactions and led to the developmental concerns.

The condition appears to be reversible by completely ceasing screen exposure. A 2-month media fast in the case study led to significant improvement in the child’s symptoms, suggesting that reducing screen time can help restore healthy interactions and social development.

Dieu-Osika, S., Bossière, M.-C., & Osika, E. (2020).

Studies concerning screen time effects on psychological and neuropsychological development in children with autism spectrum disorders

1. Comparison of sedentary behaviors between children with autism spectrum disorders and typically developing children

Many children spend a lot of time in sedentary activities, especially when it comes to using screens. This study looked at how the time spent on screens and other sedentary behaviors differs between children with autism spectrum disorder (ASD) and those who are typically developing (TD).

On weekdays, children with ASD spent about one more hour in sedentary activities compared to TD children (5.2 hours for ASD vs. 4.2 hours for TD). Much of this extra time was due to screen use.

Must, A., Phillips, S. M., Curtin, C., Anderson, S. E., Maslin, M., Lividini, K., & Bandini, L. G. (2013).

2. Screen Time and Autism: Current Situation and Risk Factors for Screen Time Among Pre-school Children With ASD

On average, children with ASD spent about 2.64 hours a day on screens. Nearly half of these children used two or more electronic devices, with watching cartoons being the most popular activity.

More screen time was linked to higher autism symptoms and lower developmental skills. Factors contributing to more screen time included lower education levels of fathers, less supervision from guardians, and children having their own devices. Many children with ASD spend over two hours daily on screens. Interestingly, weekday screen time tended to be longer than on weekends, possibly due to more parent-child interaction when parents are home.

Almost half of the children used more than two types of electronic screens, with TVs and smartphones being the favorites.

Many children had screen time before bed, which can affect sleep quality and overall behavior. Managing screen time, especially before sleep, could help with sleep issues.

2. Screen Time and Autism: Current Situation and Risk Factors for Screen Time Among Pre-school Children With ASD *(continued)*

Higher screen time was associated with more autism symptoms and lower speech and language development. This emphasizes the importance of monitoring screen time, particularly in younger children with ASD.

Dong, H.-Y., Feng, J.-Y., Wang, B., Shan, L., & Jia, F.-Y. (2021).

3. Associations between Symptom Severity of Autism Spectrum Disorder and Screen Time among Toddlers Aged 16 to 36 Months

This study reveals that for every additional hour spent on screens, the severity of ASD symptoms increased. Conversely, spending more time in social interactions was linked to fewer symptoms.

Toddlers who spent longer on screens showed higher levels of restrictive and repetitive behaviors often seen in ASD.

Higher screen time correlated with shorter periods of social engagement. This suggests that when children are more engaged with screens, they miss out on valuable social experiences that can help them develop important communication skills.

Both types of screen time (foreground, like watching cartoons, and background, like TV in the background) were found to negatively affect symptom severity, with foreground time having a stronger impact.

Sadeghi, S., Pouretemad, H. R., Badv, R. S., & Brand, S. (2023).

4. A study of the effects of screen exposure on the neuropsychological development in children with autism spectrum disorders based on ScreenQ

This study looked into how screen time affects neuropsychological development and autism symptoms in children with autism spectrum disorders (ASD). Researchers examined data from 636 children with ASD, aged around 41 months, and compared it to 43 typically developing children of similar age and found that higher screen exposure negatively affected several areas of development in children with ASD, including: personal-social skills, hearing and speech skills, eye-hand coordination.

4. A study of the effects of screen exposure on the neuropsychological development in children with autism spectrum disorders based on Screen *(continued)*

The frequency of screen use was particularly impactful, suggesting that more screen time is linked to delays in these developmental areas.

The study indicates that excessive screen exposure can lead to less interaction with parents and fewer opportunities for social engagement. This could hinder the development of important communication and social skills.

Watching screens together with adults (co-viewing) also contributed to higher autism symptoms, suggesting that even shared screen time may not be beneficial if it limits other forms of interaction.

Peng, X., Xue, Y., Dong, H., Ma, C., Jia, F., & Du, L. (2024).

Studies concerning screen time reduction and treatment outcomes

1. Behavioral and Electrophysiological Evidence for Parent Training in Young Children with Autism Symptoms and Excessive Screen-Time

This research highlights the benefits of parent training for young children showing signs of autism and excessive screen time. Here are some key takeaways:
After two months of parent-child interaction, parents also reported improved communication with their children.

Along with reduced screen time, there was a noticeable decrease in behaviors that were repetitive, which are often associated with autism.

The study looked at brain activity through EEG (electroencephalography) and found changes that corresponded with the improvements in behavior. This suggests that parent-child interactions during this critical developmental period can positively influence brain function.

The findings support the idea that when parents learn to engage more with their children and manage screen time effectively, it can lead to healthier development. This includes fostering better social interactions and potentially reducing the risk of developing more severe autism symptoms in the future.

Sadeghi, S., Pouretemad, H., Khosrowabadi, R., Fathabadi, J., & Nikbakht, S. (2019).

2. Parent–child interaction effects on autism symptoms and EEG relative power in young children with excessive screen-time

In this recent study involving 12 children with autism symptoms (averaging 33 months old) who were spending excessive time on screens, parents received training to improve their interaction with their child over two months. These are the results:

After the training, the severity of autism symptoms in the children significantly decreased. This suggests that more engaging interactions can make a real difference. Positive changes in specific brain wave patterns were found, indicating improvements in how the children's brains were functioning.

Sadeghi, S., Pouretemad, H. R., Khosrowabadi, R., Fathabadi, J., & Nikbakht, S. (2019).

3. Screen time reduction and focus on social engagement in autism spectrum disorder: A pilot study

In this study, researchers worked with nine children aged 18 to 40 months who had been diagnosed with ASD and were watching screens for at least 2 hours a day. They looked at their screen time and social interactions before and after an intervention.

The intervention included training to help parents understand the impact of screen time and in-home support**.**

They measured changes in autism symptoms, functional behavior, and overall development before and after the intervention and found that there were notable improvements in autism symptoms and a decrease in parental stress levels after the intervention.

Heffler, K. F., Frome, L. R., Garvin, B., Bungert, L. M., & Bennett, D. S. (2022).