



Screen time and ADHD

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Screen time and ADHD

- ❑ Studies on school-age children and adolescents have shown that screen time is significantly related to attention problems
- ❑ The association between screen time and ADHD has received widespread attention in preschool.
- ❑ It is estimated that preschool children are exposed to an average of **two hours of screen time** per day in **Canada** .
- ❑ Excessive screen time (**defined as more than 2.8 h/day**) is prevalent in preschool children in **Shanghai city (China)**.

- ❑ A study in **Frontiers in Pediatrics** reported that the average daily screen time among children under 5 worldwide ranges from **0.1 to 5 hours per day**, depending on the country.
- ❑ A meta-analysis in JAMA Pediatrics found:
 - ❑ Only 24.7% of children under age 2 meet the WHO guideline of “no screen time.”
 - ❑ Only 35.6% of children aged 2–5 meet the recommendation of “maximum 1 hour per day.”

Screen time and ADHD

- ❑ As an integrated part of children's lives, long screen time has become a **public health problem that cannot be ignored.**

Screen time and ADHD

- ❑ As for the association between screen time and ADHD, **two hypotheses have been suggested.**
- ❑ **First**, fast-paced media forces children to repeatedly shift their attention, which increases arousal .
- ❑ With frequent exposure, the reduced arousal level may ultimately lead to ADHD-related behaviors

Forcing the Brain to Constantly Shift Attention

- ❑ When scenes, sounds, and images change very quickly, the child's brain is forced to:
 - ❑ Jump rapidly from one stimulus to another
 - ❑ Interrupt and restart focus repeatedly
 - ❑ Continuously redirect attention
- ❑ These constant attention shifts create a pattern in the brain that resembles ADHD-like attention difficulties.

Increasing Arousal Levels

- ❑ Fast-paced media trigger the release of stimulating chemicals like dopamine.
- ❑ As a result:
 - ❑ The child becomes more excited
 - ❑ The brain enters a state of high arousal
 - ❑ Short-term, quick attention becomes active instead of sustained, long-term attention

Brain Adaptation → Reduced Arousal Threshold

- ❑ If a child is exposed to these media frequently:
 - ❑ The brain becomes accustomed to high stimulation
 - ❑ Activities that are slower, quieter, or without special effects (like reading, homework, or classroom tasks) feel boring
 - ❑ The child has less ability to stay focused on low-stimulation tasks
- ❑ This is known as **arousal dysregulation**
- ❑ difficulty regulating stimulation levels.

Final Result: ADHD-Like Behaviors

- ❑ When the brain gets used to fast, high stimulation:
 - ❑ Restlessness increases
 - ❑ Focus on slow or routine tasks decreases
 - ❑ The child loses sustained attention
 - ❑ They jump quickly from one activity to another
- ❑ These outcomes look very similar to symptoms of ADHD, even if the child doesn't actually have the disorder.

Screen time and ADHD

- ❑ **A second hypothesis** argues that the fast pacing of media prevents children from developing attentional focusing skills.
- ❑ Therefore, it is important to clarify the relationship between screen time and ADHD symptoms in preschool children.

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- ❑ Preschool years (roughly ages 3–5) are a critical period for developing the ability to:
 - ❑ Stay focused on a single task
 - ❑ ignore distractions
 - ❑ shift attention slowly and deliberately
 - ❑ persist with activities that require patience
- ❑ These skills develop through everyday experiences such as listening to stories, building with blocks, drawing, or engaging in imaginative play—activities that naturally require sustained, calm attention.

Development of Attention Skills in Children



- ❑ 1) Sustained Attention

- ❑ Initial development: ages 4–5

- ❑ Further maturation: ages 12–15

- ❑ 2) Executive Functions of the Brain: (Planning, self-control, working memory—core components of attention)

- ❑ Strong developmental phase: ages 4–7

- ❑ Major improvement: ages 8–12

- ❑ Full maturation: around age 25

- ❑ 3) **Selective Attention:** (Ability to focus on one stimulus while ignoring others)
 - ❖ Effective beginning: ages 5–7
 - ❖ Maturation: ages 9–12

- ❑ 4) **Divided Attention:**(Doing two tasks at the same time)
 - ❖ Initial emergence: ages 11–14
 - ❖ Improvement: ages 15–18
 - ❖ Maximum ability: early 20s

How Fast-Paced Media Interferes With This Development

- ❑ Fast-paced media, such as rapid cartoons, quick-cut videos, and fast-moving games, expose children to:
 - ❑ very short scenes
 - ❑ sudden transitions
 - ❑ constant novelty and stimulation
- ❑ Because the content changes so quickly, the child's brain does not need to practice slow, steady attention.
- ❑ Instead, attention is constantly pulled toward new visual and auditory stimuli.

Over time, this may lead to:

- ❑ reduced ability to stay focused on slow or quiet tasks
- ❑ difficulty tolerating boredom
- ❑ weaker development of internal self-regulation mechanisms
- ❑ In other words, the brain becomes accustomed to “fast changing” stimulation and does not develop the ability to remain focused during real-life tasks that do not change rapidly.

1. Difficulty in Attention Regulation

□ ADHD and Attention:

- 1. Individuals with ADHD often struggle with attention regulation, meaning they can become easily distracted or have trouble sustaining focus on tasks.*
- 2. Screen time, especially with fast-paced or highly stimulating content (e.g., social media, video games, or YouTube), can exacerbate this issue by further reducing attention span*

2.Social and Emotional Impacts

❑ **Social Media and ADHD:**

- ❑ *People with ADHD may be more susceptible to the negative effects of social media, including feelings of inadequacy, anxiety, and low self-esteem.*
- ❑ *Constantly seeking validation or becoming overwhelmed by information overload is more likely in individuals who already have difficulties with impulse control or emotional regulation.*

❑ **Isolation and Withdrawal:**

- ❑ *Excessive screen time can sometimes lead to social isolation, as individuals may prefer online activities over face-to-face interactions, which can compound feelings of loneliness or disconnection, particularly in adolescents.*

3. Behavioral Issues and Impulse Control

❑ Instant Gratification:

- ❑ ADHD is often associated with difficulties in managing delayed gratification.
- ❑ *The immediate rewards provided by screens (e.g., watching a quick video, achieving something in a game, receiving likes or comments on social media) can make it even harder for individuals to engage in tasks that require patience or sustained focus, such as schoolwork or chores.*

- ❑ **Hyperfocus:** On the flip side, people with ADHD sometimes experience "hyperfocus," where they become intensely absorbed in a particular activity.
- ❑ **Screen-based activities**, especially **video games**, can trigger this hyperfocus, leading to extended periods of screen time and difficulty transitioning to other activities.

Screen time, impulsivity, neuropsychological functions and their relationship to growth in adolescent ADHD symptoms.

❑ **Main Findings:**

- ❑ **Screen Time & Impulsivity:** Adolescents who spent more time on screens tended to show greater impulsivity.
- ❑ This impulsivity, in turn, was associated with worsening ADHD symptoms (e.g., increased inattention, hyperactivity, and impulsivity).
- ❑ More screen time was linked to poorer performance in neuropsychological functions, such as **working memory and response inhibition**.

❑ Causal Relationship:

- ❑ Adolescents who showed higher levels of impulsivity (linked with ADHD) were more likely to engage in excessive screen time, creating a feedback loop that exacerbates ADHD symptoms over time.

❑ Neuropsychological Functioning:

- ❑ **Neuropsychological impairments** (especially in working memory and response inhibition) were observed in adolescents with higher screen time, which might influence ADHD symptom progression.
- ❑ **Cognitive dysfunctions** such as difficulty focusing and controlling impulses were found to be predictive of increased ADHD symptoms over the study period.

❑ Longitudinal Effects:

- ❑ The study followed adolescents for 5 years, showing that higher screen time at the beginning of the study predicted greater ADHD symptom severity over time, especially in terms of impulsivity and attention problems.
- ❑ The relationship between screen time and ADHD symptoms was consistent even after accounting for other factors like socio-economic status and baseline ADHD severity.

Conclusion:

- ❑ The research highlights a potential vicious cycle between screen time, impulsivity, and ADHD symptoms.
- ❑ Excessive screen time exacerbates ADHD symptoms, especially impulsivity, and negatively impacts neuropsychological functions.

Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study

- The study examined whether the amount of screen time at an early age is associated with inattention and ADHD-like behavioral problems in preschool children.

Methods

- ❑ Data came from more than 3,500 children in the Canadian CHILD birth cohort.
- ❑ Screen time at age 3 was reported by parents.
- ❑ Inattention and behavioral problems at age 5 were assessed using standardized psychological questionnaires.
- ❑ Researchers controlled for multiple factors such as sleep, family income, parental education, and parenting style.

Key Findings

- ❑ Children who had more than 2 hours of screen time per day at age 3:
 - Were 7 times more likely to show inattention symptoms at age 5.
 - Also had higher levels of impulsivity and emotional difficulties.
- ❑ Children with less than 30 minutes per day had the lowest levels of inattention problems.
- ❑ Even after adjusting for socioeconomic and family factors, high screen time remained independently associated with greater inattention.

Conclusion

- ❑ High screen time during early childhood is linked to an increased risk of attention problems and ADHD-like behaviors by preschool age.
- ❑ The authors recommend strict limitation of screen time for children under 5 and emphasize the importance of real-life play, social interaction, and adequate sleep.

- ❑ **The study investigated how screen time, impulsivity, and neuropsychological functions (such as attention, executive function, and cognitive control) contribute to the development and progression of ADHD symptoms in adolescents.**

Methods

- ❑ Adolescents (typically early–mid teenage years) were assessed across multiple time points.
- ❑ Measures included:
 - Daily screen time (TV, phones, gaming, social media)
 - Impulsivity levels (self-report or behavioral tasks)
 - Neuropsychological performance (attention, working memory, inhibitory control)
 - ADHD symptom ratings (inattention + hyperactivity/impulsivity) Longitudinal analyses were used to track symptom growth over time.

Key Findings:

❑ 1. High Screen Time Predicts ADHD Symptom Growth

❑ Adolescents with higher daily screen exposure, especially fast-paced or highly stimulating digital media, showed:

- Increased inattention
- Increased impulsivity
- Faster growth of ADHD symptoms over time.

❑ 2. Impulsivity Plays a Central Mediating Role

- Impulsive adolescents tended to use more screen media.
- Impulsivity partially explained why screen time predicts ADHD symptoms.
- The relationship between screen time and ADHD was bidirectional, but screen time had an independent predictive effect.

❑ 3. Weak Executive Function Amplifies the Effects

❑ Adolescents with poorer:

- ❖ working memory
- ❖ response inhibition
- ❖ sustained attention

❑ were more vulnerable to the negative impacts of high screen time.

- ❑ 4. Type of Screen Use Matters Fast-paced games, social media multitasking, and media with rapid reward cycles were more strongly linked to:
 - ❑ Increased impulsivity
 - ❑ Worsening attention
 - ❑ Escalation of ADHD symptoms
- ❑ Compared to educational or slow-paced content.

Conclusions

- ❑ High screen time, especially stimulating digital media, is associated with worsening ADHD symptoms during adolescence.
- ❑ Impulsivity and weak executive function increase susceptibility to these effects.
- ❑ Reducing screen time and targeting impulsivity/executive function may help slow ADHD symptom growth.



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