A young child using a computer

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*https://www.verywellfamily.com/the-negative-effects-of-too-much-screen-time-1094877*

**Introduction**

The variety of devices enabling media consumption is constantly increasing, and there is constant improvement in their technological capabilities.  The growth in the number of websites and social networks has also attracted children and adolescents to spend more time on a device or computer screen.  As a result, there has been a steady increase in screen time for children and youth in many western countries, of an average of about seven hours a day.  Many studies in recent years have found a correlation between prolonged multimedia exposure and health problems among children. People are less aware of the other effects of screen time on health which can include harm to the endocrinal, cardio-vascular and neurological systems, as well as lead to difficulties with vision and posture.

**Effects on the Endocrine System**

Melatonin Hormone

Studies of children have found that prolonged exposure to screens- even passive viewing- causes sleep disorders, and thereby affect levels of the melatonin hormone, which regulates sleep and plays an important role in strengthening the immune system.  Sleep deprivation thus damages the immune system and may be considered an indirect cause creating risk of cancer and other illnesses.

Cortisol Hormone and the Effects of Screen Time on Functioning Under Stress

The cortisol hormone helps the body function under stressful situations by increasing blood sugar levels and reducing the response of the immune system.  Studies have shown that children using computers/devices at an average of three hours a day possessed lower cortisol levels, which can gradually damage to the body's ability to cope with stressful situations.  Studies also found that children who did not use computers/devices at all, or for less than an hour a day, possessed a higher level of cortisol.

Insulin Hormone

The insulin hormone plays a vital role in the metabolism and control of energy storage in the body.  Dysfunction in the secretion of insulin can damage the body's ability to absorb glucose to produce energy.  In a 2010 study of 496 sixteen year olds, those teens who spent over two hours a daily using computers/devices possessed higher insulin levels than those spending less time, and the higher insulin levels put them at greater risk of diabetes, to atherosclerosis, and to metabolic disorder and obesity, both which contribute to the formation of heart disease.

**The Impact of Screen Time on Obesity and on the Cardio-Vascular System**

Studies have found that among children and adolescents, screen time is linked to obesity due to unhealthy eating habits such as snacking while watching TV, or viewing TV during dinner time.  Like television, video games may also contribute to obesity since they increase food consumption by adolescents immediately after a game irrespective of actual sense of hunger.

Various studies have found that sitting during video games is linked to an increase in blood pressure, to irregular cholesterol levels, and to the narrowing of the arteries reaching the eyes, a phenomenon known as an indicator of future risk of heart disease.  The research has also found that children participating in physical activities possessed wider arteries reaching the eyes, reducing the risk of heart disease.

Other studies of pre-pubescent children found a high correlation between computers/devices time and high blood pressure (systolic and diastolic).  In contrast, activities such as drawing were not found to effect changes in blood pressure.

Risk of cardiovascular disorders such as hypertension and stroke are created by the existence of extended physical arousal (sympathetic).  A 2010 study in Finland of 478 children aged 10-14 examined the effects of exposure to information and communication technology (ICT) on the balance between the sympathetic and the parasympathetic nervous systems during sleep.  The study found that larger consumption of information and communication technology through multimedia (mobile phones, computer games, web browsing, email, chat rooms) increased physical arousal during sleep, which may harm the quality of sleep.

**Neurological Effects**

The development of screen media is based on the rapid presentation of material on the screen ("screen novelty").  This phenomenon is most evident in computer games content and in TV program content for children, and it is a major factor in media consumption. "Screen novelty" affects dopamine, an important neurotransmitter influencing arousal, attention ability, and response to new stimuli.  Dopamine is also considered a key element in the creation and maintenance of addiction.  One study found an increased and faster release of dopamine in young adults (over 18) during video games.  In light of this finding, there is an increasing concern that intensive computer games use may cause long-term changes in the brain to the point of addiction to the production of dopamine, essentially simulating a situation of substance dependence.

Although interactive computer games are thought to trigger more stimulants than watching TV or a DVD movie, the study found that computer games actually generate limited neurological activity.  In 2011 The World Federation of Neurology reported about a Japanese study mapping the brains of children playing computer games, and of children solving repetitive and simple math exercises.  The children playing computer games presented brain activity in only one the cerebral lobe associated with vision and movement.  However, the children performing the math equations presented brain activity in both frontal lobes related to learning, memory and emotions affecting social behavior.  With this in mind, the message from the study is that computer games may delay the development of the frontal lobes and the development of the ability to control social behavior.  In light of this study, the World Federation of Neurology recommends reducing the use of computer games, and the encouragement of children to play outside with children and to interact socially with others as much as possible.  An additional conclusion that can be deduced is that there is an advantage to computer games requiring a combination of two players together in the same location, and to computer games that require deeper thinking.

**Vision**

Sitting for hours in front of a screen causes eye fatigue and impairment in visual acuity, focus, ability to concentrate, and may cause headaches and neck and shoulder pain.  Symptoms appearing after prolonged periods in front of screens are dryness and myopia.  Adapting one's work environment, wearing glasses, adjusting appropriate lighting, along with scheduled breaks from the computer, will maintain one's health and enhance one's ability for comfortable viewing.

**Posture**

Sitting for long hours, especially in front of touch devices, may adversely affect posture, causing neck and shoulder pain, pain in the hands, and lead to the development of early scoliosis.  Extensive use of touch devices, keyboards and mice that are not adjusted properly can cause strain and lead to pain and inflammation in the arms and hands and wrists.

**Summary and Conclusions**

Today consensus in developed countries exists that there is an increase in risk factors as screen time exceeds two hours per day, and even less for younger ages.  Reduction in screen time can lead to significant improvements in children's health and development.  There is no need to fear that the lack of young children's exposure to screen technologies put them at a developmental and educational disadvantage; they can easily and gradually acquire computer skills in a more safe fashion as they age.

Parental rules and restrictions on screen time, and the removal of computers/devices from the bedroom, effectively reduce children's screens viewing time.  Additionally, a negative dose-response relationship was found between weekly physical activity and the risk of exceeding recommended screen time limits.  Parental modeling is another important component, and children living in homes with parents/siblings consuming much media will increase likely do the same.

Children should be encouraged to engage in alternative activities such as sports or creative activities (e.g., problem solving games, logic games) to develop additional skills.  Parents' playing with children is highly recommended, as is reading books to them.

The present reality in Israel is such that parents and authorities in the health and education sectors are simply unaware of the health hazards of screen time, and it imperative to educate them first about the risks.  The Ministry of Health has issued vague recommendations as general guidelines for reducing screen time.

A 2013 position paper of the Association of Dietitians and Nutritionists in Israel recommends limiting screen time and avoiding eating while viewing screens.  The paper emphasizes the correlation between screen time and high intake of high-calorie foods, and recommends avoiding eating in front of screens, since this leads to eating foods of poor nutritional quality such as snacks and sweets.  Another negative aspect of sitting in front of screens is their advertisements that encourage consumption of snacks and sweets.  The paper made reference to studies showing a correlation between reduced screen time and reduced energy consumption, and thereby lower obesity.

**Recommendations for Parents to Prevent Injuries to Health, and Instructions for the Safe Use of Media**

* Encourage parents to monitor and control the time their children spend in front of screens.
* Raise parents' awareness that their viewing habits are a source of emulation and may affect their children's habits; backgrounds of passive media also can influence health.
* Encourage parents to develop a comprehensive user plan for all types of media at home, including content type and time management.
* Reduce as much as possible the use of media devices during meals, an hour before sleep, and during sleep.
* Establish frequent breaks when using devices.
* Suggested daily total viewing time for all screens:

Ages 0-2:               Refrain from any viewing.  No studies demonstrate benefits of watching TV or videos at this age; many studies stress the importance of human contact with infants.

Ages 3-7:               0.5-1 hours a day

Age 7-12:              1 hour a day

Age 12-15:            1.5 hours a day

Age 16+:                                2 hours a day

* Situate the home computer in a central room accessible to all members of the family; refrain from allowing the use of any Internet-connected device in bedrooms, both to monitor content and time use, and to prevent sleep disorder.
* For young children, select media that possess a slow change rate of screen content, such as storytelling and children's performance programs, arts and crafts activities, games that require thinking and logic, and relatively older movies which possess fewer stimuli as new ones.
* Be sure to ergonomically structure the computer/device workspace environment (e.g., adjust the height of chair, table, screen, etc.)
* Create a "device free" space in your home, such as in the kitchen or at the dinner table.
* Refrain depending on multimedia as a babysitter.
* Encourage sports and cultural activities that are not computer/device based.

**Recommendations to Reduce Damage to the Eyes**

* Reduce screen brightness
* Take scheduled breaks
* Use proper lighting
* Wear glasses as needed

<http://www.netivei-reshet.org/en/node/76>

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https://www.rcpch.ac.uk/sites/default/files/2018-12/rcpch\_screen\_time\_guide\_-\_final.pdf

# Positive impact of a screen time

1. **Screen time is good when technology is used as a tool**
2. **Screen time leads to writing more**
3. **Screen time helps your child learn discernment**
4. **Screen time helps families set boundaries**
5. **Screen time is educational**
6. **Screen time can lead to responsible children**

https://literateforlife.org/screen-time-benefits/

A growing body links excessive and addictive use of digital media to physical, psychological, social and neurological adverse effects. Research is more focused on mobile device usage, and research shows that duration, content, nighttime usage, media type, and number of devices are key components in determining the effects of screen time. Physical health implications: Excessive screen time is associated with poor sleep and cardiovascular risk factors such as high blood pressure, obesity, low HDL cholesterol, poor stress regulation (high sympathetic arousal and dysregulation of cortisol), and insulin resistance. Other physical health effects include visual impairment and reduced bone density. Psychological effects: Internalizing and externalizing behaviors are associated with poor sleep. Depressive symptoms and suicidal ideation are associated with **screen time, late-night digital device use, and** sleep **deprivation** caused by **cell** phone addiction. **ADHD-related** behaviors **are associated with** sleep problems, total screen time, **dopamine** and **violent, fast-paced** content that activates reward pathways. Early and **long-term** exposure to violent content is also associated with **reduced** risk of antisocial behavior and **reduced** prosocial behavior. **Psychological and neurological** effects: **The** use of screen time **addiction** reduces the ability to **deal** with social problems and **is accompanied by** passionate behavior **similar to** that **of drug** addiction. Structural brain changes associated with cognitive control and emotional regulation are associated with addictive **behavior** in digital media.**Conclusions:** Excessive use of digital media by children and adolescents appears to be a major factor that may hinder the development of healthy psychophysiological resilience.https://pubmed.ncbi.nlm.nih.gov/29499467/#:~:text=Physical%20health%20effects%3A%20excessive%20screen,dysregulation)%2C%20and%20Insulin%20Resistance.