

Conclusive Evidence Proves Screens Destroy Your Eyes

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Myopia (nearsightedness) is a vision problem in which close objects appear clear but distant objects are blurry
- › Nearsightedness is thought to be caused by refractive errors in your eye, which occur when the shape of your eye prevents light from focusing properly on your retina, either due to changes in the shape of your eye, the shape of your cornea and/or changes in your lens due to aging
- › According to recent research, excessive staring at electronic screens results in significantly increased risk for myopia and speeds its progression by altering the structure of your eyeball
- › Excessive screen time also causes the glands that keep your eyes moist to atrophy, resulting in painful dry eyes
- › Melatonin and lutein are important for eye health. Lutein in particular has been shown to significantly reduce your risk for myopia. The most important prevention strategy, however, appears to be spending more time outdoors in natural daylight and cutting screen time

Nearsightedness (myopia) is incredibly common, affecting 41.6% of Americans.¹ By 2050, myopia is predicted to affect half the global population.^{2,3}

Myopia is a vision problem in which close objects appear clear but distant objects are blurry. This condition is thought to be caused by refractive errors in your eye. Refraction

is the bending of light as it passes through one object to another.

When light rays are refracted through your eye's cornea and lens, they become focused on the retina, which then converts the light into messages sent through the optic nerve to your brain, which then interprets the messages into images.

Refractive errors occur when the shape of your eye prevents light from focusing properly on your retina due to changes in the shape of your eye, such as the length of your eyeball or shape of your cornea, and/or changes in your lens due to aging. But what exactly is responsible for these changes?

Conclusive Proof: Excessive Screen Time Promotes Myopia

According to recent research, excessive staring at electronic screens is to blame. As reported by CBC News:⁴

“Eye health experts say research now links overuse of computer and smartphone screens to several progressive, irreversible eye disorders, such as dry eye disease and myopia, at rates not seen before ...

Over time, staring too long at screens can change the structure of the eyeball and lead to atrophy of the glands that keep it moist. Research is now pointing to excessive screen time for the rise in eye disorders, such as dry eye and myopia, which are becoming more common and affect more young people ...

While myopia or nearsightedness has a genetic component, it has been shown to progress faster in people who overuse screens ... When the eye is forced to stare at something too close, the brain and eye adjust or ‘accommodate’ to increase close-up vision.

Over time, the squeezing of muscles can change the shape of or elongate the eyeball. This can cause dramatic changes in eye function, especially in a child's eye that's not fully developed ...

[Dr. Vivian Hill, a Calgary-based pediatric ophthalmologist and surgeon who chairs the Council on Advocacy of the Canadian Ophthalmological Society] calls the pandemic the 'worst' thing for myopia, as rates spiked worldwide. She also said she's seeing more cases of crossed eyes and double vision.]

How Long Is Too Long?

Unfortunately, we still do not know exactly how many hours is too many when it comes to screen time. Hill suggests that rather than fixating on a specific number of hours, be aware of how your eyes feel while you're watching TV, working on your computer or browsing the net on your phone. If your eyes feel dry, tense or tired, take more frequent breaks and be conscious of your need to blink more often.

That said, children between the ages of 5 and 17 should keep their screen time below two hours a day, Hill suggests. Overall, there appears to be a linear progression between screen time and the risk for myopia, so the more time a child spends looking at electronic screens, the higher their risk for nearsightedness. In the first year of life, a baby should not be exposed to electronic screens at all. Dr. Rana Taji, an ophthalmologist with Toronto Medical Eye Associates, told CBC news:⁵

"There is an explosion of a faster progression of myopia in children. Just the other day I had a patient who was 9 or 10 years old, and we've been watching him. His prescription has progressed at an alarming rate, faster than the average. We've had multiple discussions about reducing screen time and increasing outdoor activity."

Spending Time Outdoors Is Protective

Hill stresses that slowing the progression of myopia in children is crucial, because myopia raises the child's risk of retinal detachment, glaucoma and other eye problems later on.

Like Taji, Hill advises her young patients to spend recess and lunch outdoors, to take breaks when using digital devices, and to make sure they're getting daily exposure to natural sunlight. Sunlight releases dopamine in your retina, slowing the growth of your eye and therefore possibly slowing the elongation of the eye and changes to your sight.⁶

Remarkably, a British survey from 2016 found that 75% of children in the U.K. spent less time outdoors than prison inmates.⁷ Considering we've just gone through three years of on-and-off lockdowns and school shutdowns, this statistic may be even worse nowadays.

Electronic Screens Also Promote Dry Eye

Dry eye is another common eye problem that can be triggered or exacerbated by excessive screen time. Research⁸ has shown that looking at digital devices reduces your blink rate, which in turn degrades your gland function. As reported by CBC news:⁹

"When humans stare at screens, their blink rate decreases. Blinking activates the meibomian glands. If the eye does not blink enough, this can clog the glands and, over time, damage them. Dr. Vivian Hill ... said it's critical to give eyes a break and lubricate them by blinking.

'Whenever we're staring at a screen, our blink rate goes down to about 10% of normal. So that means we're blinking once instead of 10 times,' she said. 'The eyelids are little windshield wipers that have oil glands in them that basically smooth the oily tears, the moisturizing tears, over the eyeball.'"

Melatonin's Role in Myopia

Melatonin can be synthesized in your eye tissues including the lens, retina and cornea, which have melatonin receptors,¹⁰ all of which hints at melatonin's importance for regulating eye processes.

Several studies have also associated myopia with poor sleep, including poor quality sleep, insufficient hours of sleep, late bedtime and delayed melatonin circadian timing, which further suggests melatonin plays a role – although the extent or precise nature of that role is still unclear. As reported in the February 1, 2023, issue of Review of Myopia Management:¹¹

“Of the identified risk factors, two major behavioral risk factors for childhood myopia incidence and progression, namely education and insufficient outdoor time, have been confirmed across many studies. Lately, emerging evidence from several studies has been accumulating for the role of sleep in childhood myopia ...

[S]everal studies have associated more myopia with problematic sleep ... Additionally, a higher concentration of melatonin, the hormone that initiates sleep, was identified among myopic individuals in the morning compared to non-myopes.

Does this mean that myopes have more overnight melatonin residue, which can increase their daytime sleepiness? Is this difference associated with daily outdoor hours? Future studies may be able to answer this question.

The importance of a regular light-dark cycle or circadian rhythm on the normal development of the eye was noticed early in the 1950s and has been endorsed by many later studies.

Genetic factors involved in circadian entrainment were associated with refractive error development; modifications to the Clock Gene that regulates circadian rhythm could stimulate abnormal ocular growth and induce myopia. Meanwhile, diurnal rhythms were detected in various ocular components.

For instance, axial length of the eye is the longest around midday and decreases to the shortest around midnight before elongation starts. Amongst those rhythms, variations in axial length and choroidal thickness are of particular interest to myopia research.

A recent study found significant differences in refractive error and axial length diurnal changing patterns between late versus early sleepers, suggesting a connection between poor sleep and myopia through disrupted ocular rhythms ...

[A]lthough outdoor time is a well-established protective factor against childhood myopia, the mechanisms underlying its protective effect are not well understood ... [T]aking sleep into consideration may offer a new perspective. Outdoor activities can produce better sleep as it promotes the regulation of melatonin secretion, leading to regular sleep onset in children.

Seasonal variations, probably due to differences in day lengths or light hours between seasons, were observed in myopia development, axial length diurnal rhythms, and sleep patterns, indicating a complex relationship among these factors."

As detailed in "[Can Melatonin Impact Your Eye Health?](#)" melatonin has also been shown to lower intraocular pressure in patients with glaucoma^{12,13,14} and counteract lens damage associated with cataracts. It may also be useful for age-related macular degeneration and dry macular degeneration.

Lutein Protects Against Myopia and Other Eye Diseases

Lutein is another nutrient that is really important for eye health and helps to protect against myopia. In one 2020 study,¹⁵ subjects with the highest lutein concentrations were found to have a 40% reduced risk of nearsightedness. An earlier study,¹⁶ published in 2017, found people with the highest plasma lutein concentrations had a 43% lower risk of myopia.

Lutein also helps ward off age-related macular degeneration, cataracts, glaucoma and other eye diseases. Lutein concentrates in your macula, which is the part of your retina responsible for central vision. It's also found in your lens.

Importantly, lutein is very efficient at filtering out blue light – the type that comes from cellphones, computers, tablets and LED lights. Blue light induces oxidative stress in your

eyes, which increases your risk of macular diseases. Lutein, however, acts as a shield against it.

Your body cannot make lutein, so you must get it from your diet. Following are 10 foods that are particularly rich sources of lutein.

Dark leafy greens	Carrots
Broccoli	Egg yolks
Red and yellow peppers	Sweet corn
Avocados	Raspberries
Cherries	Paprika

Lutein and other carotenoids are fat-soluble, so to optimize absorption be sure to consume it along with a source of healthy fat, such as coconut oil or grass-fed butter. Because organic, pastured egg yolks contain fat, they're among the healthiest sources of lutein.

Spend More Time Outdoors

While certain nutrients are important, the recommendation to spend more time outdoors may be the real key here. Two studies, the first published in 2007¹⁷ and the second in 2008,¹⁸ found that rates of nearsightedness in children appeared to be closely linked to the amount of time spent outdoors. The greater the number of hours spent playing outside, the lower the risk of nearsightedness.

“ The most important prevention strategy appears to be spending more time outdoors in natural daylight and cutting screen time. ”

Research¹⁹ published in June 2022 highlights the benefit children reap when spending more time outdoors. Among children aged 5 to 17 who live in urban areas, the myopia rate is 41%, whereas children who live in rural areas – and tend to spend more time engaged in outdoor activities – have a myopia rate of just 15.7%.

One previous study^{20,21} concluded that spending just one more hour outdoors each week may decrease a child's risk of myopia by 14%. Another study showed that by encouraging children at one school to spend their daily 80-minute break outdoors, rates of myopia dropped to 8% compared to 18% at another nearby school.²²

According to optometrist Donald Mutti, children who are genetically predisposed to nearsightedness are 300% less likely to need glasses if they spend at least 14 hours a week outdoors.²³

Research by Ian Morgan of the Australian National University suggests that exposure to light levels of at least 10,000 lux for three hours a day may protect children from nearsightedness.²⁴

This is the amount of light you would be exposed to on a bright summer day. An indoor classroom, by comparison, would only provide about 500 lux. So, a simple way for parents to protect their children's eyesight is to make sure they trade some of their screen time for outdoor playtime.

The Bates Method for Nearsightedness

While the conventional view is that myopia is irreversible, many have been able to improve their nearsightedness using a method conceived by Dr. William H. Bates over 100 years ago.

A board-certified ophthalmologist at the top of his field, Bates taught his method to many, and it was so effective that it ended up being banned in New York after the optometrists lobbied the local politicians. Today, his method is being taught by Bates Method International.²⁵ It's also detailed in Bates' book, "The Bates Method for Better Eyesight Without Glasses."

The Bates Method works by relaxing the muscles surrounding your eyes. You have six muscles on the outside of your eye that allow your eye to move and follow visual interests. The problem is that any number of factors can cause you to strain, and as soon as you strain, your vision starts to blur.

The action of straining essentially squeezes your eyeballs, contorting them. This makes your vision blurry, as it alters where the field of vision "lands" on your retina. Now you have three basic choices.

1) You can get corrective lenses. The problem is that now you're creating permanent strain, 2) you can get laser in-situ keratomileusis (LASIK), which permanently alters your focal length, or 3) find out what's making you strain, then relax and get your vision back.

One of the most famous Bates Method techniques is palming. Here's a quick summary of how it's done. First, look around and notice the level of clarity of your vision at present. Then:

1. Place the center of your palms over your eyes. Relax your shoulders. You may want to lean forward onto a table or a stack of pillows, to facilitate relaxation.
2. Relax like this for at least two minutes.
3. Remove your hands, open your eyes, and notice whether anything looks clearer. Usually, it will.

The Bates Method is quite simple, yet it requires patience and a certain amount of finesse. Remember, the goal is not to "train" or exercise your eyes to make them stronger. The goal is to relax them.

Bates was also a proponent of sun exposure to the eyes to help correct vision problems,²⁶ and recent research suggests he was on the right track 100 years ago. It just goes to show that, as humans, we cannot extract ourselves too far from the natural world.

Indeed, we depend on the natural order of things to thrive, and that includes being exposed to sunlight during the daytime, and avoiding light exposure once the sun has

set. Altering this natural order has consequences for our health, including but certainly not limited to our vision.

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