

What day this is? This is I-lost-count-of-the-quarantine-day. But we are somewhere in week four of home-schooling. The idea that my kids get on their bikes to their respective schools is a distant memory by now. The teens have locked themselves up in their rooms for the remainder of the day. I have to say, the way they respond to this crisis is impressive. They work; they work hard – and stay up to speed with what the schools dictate. Big thumbs up to the schools as well. This is a Guinness-book ‘turning-physical-schooling-into-digital-schooling’ record. An achievement that makes me proud: of my kids and the system.

Device-Induced Dryness

It is a little bit trickier when it comes to ‘downtime’. Typically, after a full day of school with people around them constantly – I can totally see the need of some Netflixing or gaming. They still deserve that kind of their favourite downtime.... but we lost count of ‘screen time’. Apart from the near work/myopia thing and what it does to the mind psychologically, there is something else when it comes to the significant use of devices by our teens. I see them at the end of the day, with red eyes of staring at screens.

Prolonged screen time leads to eye-fatigue and ocular discomfort. One simple explanation for eye-redness is the alteration in eyeblink-pattern. It has been well established that if we stare at screens – that our eyeblink rate goes down. The average eyeblink rate is 14.5 in primary gaze, 21.5 during conversation – but drops to 7.9 while we are reading (screen or not).

The tear film is a beautiful, yet complex system, which deserves an award. If you think about it: how does a water phase layer adhere to human tissue? It involves mucins. Not one or two, but at least 16 different types of mucins have been detected in the tear film. Some mucins produced by the corneal epithelium adhere to other mucins in the tear film produced by Goblet cells. This process attaches the tear film to the corneal epithelium. Apart from mucins the tear film involves a large component of water. So, the aqueous phase of the tear film can be adhered to the cornea via the mucins – but it would evaporate drastically fast if there was no protection. This protection comes in the form of lipids – yet produced somewhere else (the Meibomian glands). They form an oily layer on top of the tear film, to prevent evaporation.

Lagophthalmos

This complex mechanism is easily disrupted. By blinking less, water evaporates faster and the tear film ‘breaks open’, which can be measured as break-up-time (BUT) in seconds after the last blink. It can lead to corneal staining – epithelial cells that are exposed and get damaged through dryness. The problem is that we blink less, and in addition the quality of the eyeblinks diminishes when on devices. We produce more ‘half-blinks’ and ‘incomplete-blinks’ when we stare at screens. As a result, the eyes ‘stay open’ for longer periods. There is a condition called lagophthalmos, which is the inability to close the eyelids during sleep. The name derives from the Greek **λαγῶς** or “hare” referring to that allegedly hares sleep with their eyes open. While this is a myth, the need for good eye blinking in our teens to prevent device induced dryness, is not a myth. In other words: we have to tell our teens to apply proper eyelid hygiene, to sleep less but close their eyes more. Parenting. Never easy.

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