

# Increased Screen Time and Dry Eye: Another Complication of COVID-19

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During a time of relative social isolation because of the coronavirus disease 2019 (COVID-19) virus, electronic devices have enabled people to continue to work, learn, and socialize. The long-term effects of this increase in electronic device use on physical and mental health are unknown and will take years to determine. Before COVID-19, the negative effect of prolonged screen time on the health of the ocular surface was known<sup>1</sup> and the increased use of electronic devices necessitated by the pandemic will exacerbate this problem.<sup>2</sup> In addition, once the current health crisis subsides, many people will continue to work, learn, and socialize remotely through electronic devices so that the effect of screen time on the ocular health will continue to be an issue for the foreseeable future.

In India, where COVID-19 continues to overwhelm the health care system, Bahkir and Grandee<sup>3</sup> surveyed 407 people (average age 27.4 years) through social media platforms and found that the average increase in screen time during lockdown was  $4.8 \pm 2.8$  hr per day, resulting in an average screen time usage of  $8.65 \pm 3.74$  hr. Not surprisingly, 95.8% of respondents experienced at least one symptom related to digital device usage and 56.5% reported an increase in symptoms frequency and intensity during lockdown.<sup>3</sup> This is also true for patients of almost all ages; before COVID-19, in 2018, Sheppard and Wolffsohn<sup>4</sup> reported that 68% of children regularly use a computer by age 3 and 37% of adults aged 60 years and older spend 5 or more hours daily on digital devices. Mineshita et al.'s<sup>1</sup> recent study of 7,419 elementary school children in Japan found that, in addition to dry eye, increased screen time is associated with obesity, decreased physical activity, and reduced academic performance.

With all of the mortality and morbidity caused by COVID-19, an increase in ocular surface disease caused by an increase in screen time seems insignificant. However, dry eye disease is associated with increased rates of depression and suicide,<sup>5</sup> both of which maybe increased during a pandemic (although it is still too early to determine the effect of COVID-19 on depression and suicide rates). Therefore, if there are modifiable risk factors for dry eye, now is the time to address them. The decreased blink rate is likely the primary mechanism by which electronic device use worsens dry eye. Patel et al.<sup>6</sup> showed that the blink rate decreased from 18.4 blinks/min before computer use to 3.6 blinks/min during computer use.

Now that multiple vaccines are available, COVID-19 restrictions are being lifted in some parts of the world. However, the use of

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computers, smart phones, tablets, and other electronic devices will continue, so we need to educate our patients and advise them on best practices. In addition to limiting the overall digital screen exposure, people should be advised to take breaks at regular intervals during which time they may close their eyes, apply a tear drop, or look away into the distance (preferably outside).<sup>7,8</sup> Some monitors offer the option of “night light” (Microsoft) or “night shift” (Apple) screen settings, but there are no data as to whether these settings mitigate the risk to the ocular surface of screen time in general.<sup>1</sup> When setting up workstations, people should position their screens to look downward instead of upward or straight ahead to decrease the palpebral aperture.

Fortunately, some, if not all, of the increase in dry eye disease associated with digital device use is reversible. In 2014, Moon et al.<sup>9</sup> studied smartphone use and dry eye signs and symptoms in children in South Korea and found that both signs and symptoms resolved after 4 weeks of screen time cessation. They also found that time spent outdoors was protective against dry eye disease, which gives us all another reason to spend time outside after more than a year of too much time inside. The most important advice we can give our patients with dry eye symptoms is to be mindful of their use of electronic devices and to seek out alternative modalities for working, learning, and socializing when possible.

## REFERENCES

1. Mineshita Y, Kim HK, Chijiki H, et al. Screen time duration and timing: Effects on obesity, physical activity, dry eyes, and learning ability in elementary school children. *BMC Public Health* 2021;21:422.
2. Napoli PE, Nioi M, Fossarello M. The “Quarantine Dry Eye”: The lockdown for coronavirus disease 2019 and its implications for ocular surface health. *Risk Manag Healthc Policy* 2021;14:1629–1636.
3. Bahkir FA, Grandee SS. Impact of the COVID-19 lockdown on digital device-related ocular health. *Indian J Ophthalmol* 2020;68:2378–2383.
4. Sheppard AL, Wolffsohn JS. Digital eye strain: Prevalence, measurement and amelioration. *BMJ Open Ophthalmol* 2018;3:e000146.
5. Um SB, Yeom H, Kim NH, et al. Association between dry eye symptoms and suicidal ideation in a Korean adult population. *PLoS One* 2018;13:e0199131.
6. Patel S, Henderson R, Bradley L, et al. Effect of visual display unit use on blink rate and tear stability. *Optom Vis Sci* 1991;68:888–892.
7. Kim DJ, Lim CY, Gu N, et al. Visual fatigue induced by viewing a tablet computer with a high-resolution display. *Korean J Ophthalmol* 2017;31:388–393.
8. Hu JW, Zhu XP, Pan SY, et al. Prevalence and risk factors of dry eye disease in young and middle-aged office employee: A Xi'an Study. *Int J Ophthalmol* 2021;14:567–573.
9. Moon JH, Kim KW, Moon NJ. Smartphone use is a risk factor for pediatric dry eye disease according to region and age: A case control study. *BMC Ophthalmol* 2016;16:188.