

Effects of online education on students' eye health during the Covid-19 pandemic

Efeitos da educação online na saúde ocular dos estudantes durante a pandemia da Covid-19

Milton Ruiz Alves¹, Ricardo Nogueira Louzada²

1. Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brasil.

2. Programa de Pós-Graduação em Ciências Cirúrgicas, Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brasil.

"Life cannot be saved for tomorrow.

It always happens in the present."

Rubem Alves

Globally, the rates of new cases and deaths from the coronavirus disease 2019 (COVID-19) pandemic continue to rise, with nearly 4 million new cases and 60,000 new deaths recorded. Approximately 53.7 million COVID-19 cases and 1.3 million deaths were confirmed and reported to the World Health Organization¹ until November 15, 2020. According to the United Nations Educational, Scientific and Cultural Organization, as part of broader measures to curb the spread of COVID-19, since February 2020, 191 countries have taken steps to implement the closure of educational institutions across the country, including nurseries, schools, vocational training colleges, and universities. During this period, approximately 1.58 billion students were away from schools, representing over 90% of the total students enrolled worldwide—an unprecedented situation in the history of education². An important consequence of home confinement over children's eye health may have a significant impact on the overall development and/or worsening of myopia³. "Quarantine myopia," manifested earlier in the pediatric population, may put the vision of these children at risk³ in the future. Increased academic pressure and decreased time spent outdoors are important risk factors for the development of myopia⁴⁻⁸. Adequate exposure of children to sunlight, for at least 1 h per day during the pandemic, can be achieved with effective occupation of spaces around the house such as the terrace, balcony, and garden, which have very high lighting levels, even in shaded environments compared with indoor environments⁹. Therefore, a post-pandemic ophthalmological surveillance program for children with myopia involving decision making based on demographic and clinical characteristics, risk factors, and individual preference should be considered to control the progression of myopia³.

Corresponding author: Milton R. Alves. E-mail: miltonruizcbo@gmail.com

Received on: November 21, 2020. **Accepted on:** November 26, 2020

Funding: The author declares there is none. **Conflicts of interest:** The author declares there is none. **CEP opinion:** not applicable.

How to cite: Alves MR, Louzada RN. Effects of online education on students' eye health during the Covid-19 pandemic. eOftalmo. 2020;6(4):68-70.

DOI: 10.17545/eOftalmo/2020.0015



This content is licensed under a Creative Commons Attribution 4.0 International License.

Universities were also closed as part of social isolation measures to flatten the COVID-19 span curve and classroom teaching was also replaced by *online* education. During the pandemic, *online* education may be contributing both to reducing the transmission rate of the virus and to producing negative effects on students' eye health¹⁰. Evaluations of eye health and asthenopia or eye fatigue related to online education were conducted in 402 university students, with a mean age of 20.26 years¹⁰. The study showed that the eye health of the university students during the COVID-19 pandemic was negatively affected by *online* education. In other words, asthenopia or eye fatigue increased due to worsening of eye health impairment by *online* education¹⁰. The repercussions of online teaching on students' eye health may have been intensified by the excessive use of devices with digital screens, used without adequate pauses, manifested as part of the digital asthenopia spectrum¹¹.

The ophthalmological examination of the students should include in addition to measuring the refractive error under cycloplegia, vergence accommodation measures, plus evaluations of extrinsic ocular motility, lacrimal film, and ergonomics related to the use of electronic devices¹². Students should be instructed to follow the 20–20–20 rule, that is, they should take a 20-s break and focus the eyes on objects at least 20 ft (6 m) away from their devices every 20 min. Then, they should blink voluntarily and completely as much as they can to reduce the symptoms of asthenopia and dryness of the eyes¹³. Accommodative dysfunctions, including accommodative spasm (pseudomyopia) and acute esotropia have been reported in the literature due to excessive use of electronic devices¹⁴. Proper sleep hygiene is also essential for maintaining eye health, and for this, students should be educated in relation to the web applications based on *Family Link* (by Google) that can be installed on digital devices to monitor and restrict the screen time and set pauses and sleep time¹² as an alternative to wearing blue light-blocking glasses¹⁵.

The eye health of all people, but particularly of children, is of paramount importance, especially during these times of social isolation when we use the digital world more often, almost constantly and with an important functional and affective role^{16,17}. It is the collective responsibility of all health professionals, parents, teachers, and stakeholders to create a safe visual environment for children during and after

the COVID-19 pandemic. There is no doubt that it is necessary to build a national eye health policy with the aim of delaying the onset and progression of myopia in Brazilian elementary school students as soon as possible¹⁸. These programs should provide students with sunlight exposure during outdoor activities for 10–14 h per week and also restrict close range visual tasks at very short distances and those longer than 2 h daily, especially using a smartphone, tablet, or computer. They will need to acknowledge that the prevalence of myopia and high myopia is increasing throughout the world and also among us and that the bioenvironmental factors are playing the most important role in this increase. Therefore, campaigns focusing on eye health education should emphasize primarily on environmental and behavioral changes in our students. They should consider that even partial results in preventing and/or delaying the progression of myopia will represent a significant reduction in the number of people with high myopia and irreversible vision loss¹⁸ in the future.

REFERENCES

1. WHO(2020) Coronavirus disease (COVID-19) weekly epidemiological update - 17 November 2020. Disponível: <https://www.who.int/publications/m/item/weekly-epidemiological-update---17-november-2020>. Acessado: 20/11/ 2020.
2. UNESCO (2020) COVID-19 education response: Preparing the reopening of schools: resource paper. Disponível: <https://unesdoc.unesco.org/ark:/48223/pf0000373401?posInSet=17&queryId=68f3db81-cb77-4344-862e-bfc1e78829b3>. Acessado: 20/11/ 2020.
3. Pellegrini M, Bernabei F, Scoria V, Giannaccare G. May home confinement during the COVID-19 outbreak worsen the global burden of myopia? Graefes Arch Clin Exp Ophthalmol. 2020;258(9):2069-2070. doi:10.1007/s00417-020-04728-2.
4. Alves MR, Alves MRR, Lui AF, Carvalho KMM. Tempo em ambiente externo, exposição à luz violeta e prevenção da miopia em crianças. eOftalmo. 2018;4(3):92-5. <http://dx.doi.org/10.17545/eoftalmo/2018.0017>
5. Hsu C-C, Huang N, Lin P-Y, Fang S-Y, Tsai D-C, Chen S-Y, Tsai C-Y, Woung L-C, Chiou S-H, Liu J-L. Risk factors for myopia progression in second-grade primary school children in Taipei: a population-based cohort study. Br J Ophthalmol. 2017;101: 1611-1617.
6. Williams KM, Bertelsen G, Cumberland P, Wolfram C, Verhoeven VJM, Anastasopoulos E, et al. Increasing prevalence of Myopia in Europe and the impact of education. Ophthalmology. 2015; 122(7):1489- 97. doi: 10.1016/j.ophtha.2015.03.018
7. Lingham G, Mackey DA, Lucas R, Yazar S. How does spending time outdoors protect against myopia? A review. Br J Ophthalmol. 2020;104(5):593-9. doi: 10.1136/bjophthalmol-2019-314675

8. Wen L, Cao Y, Cheng Q, Li X, Pan L, Zhu H, et al. Objectively measured near work, outdoor exposure and myopia in children. *Br J Ophthalmol*. 2020;104(11):1542-7. doi:10.1136/bjophthalmol-2019-315258
9. Lanca C, Teo A, Vivagandan A, Htoon HM, Najjar RP, Spiegel DP, et al. The effects of different outdoor environments, sunglasses and hats on light levels: Implications for myopia prevention. *Transl Vis Sci Technol*. 2019;8(4):7. doi:https://doi.org/10.1167/tvst.8.4.7
10. Kaya H. Investigation of the effect of online education on eye health in Covid-19 pandemic. *Int J Asst Tools in Educ*. 2020;7(3):488-96. https://doi.org/10.21449/ijate.788078
11. Bathacharya S, Saleem SM, Singh A. Digital strain in the era of COVID-19 pandemic; A emerging public health threat. *Indian J Ophthalmol*. 2020;68(8):1709-10.
12. Hussaindeen JR, Gopalakrishnan A, Sivaraman V, Swaminathan M. Managing the myopia epidemic and digital eye strain post COVID-19 pandemic – What eye care practitioners need to know and implement? *Indian J Ophthalmol*. 2020;68(8):1710-2.
13. Coles-Brennan C, Sulley A, Young G. Management of digital eye strain. *Clin Exp Optom*. 2019;102(1):18-29. https://doi.org/10.1111/cxo.12798
14. Lee HS, Park SW, Heo H. Acute acquired comitant esotropia related to excessive Smartphone use. *BMC Ophthalmol*. 2016 Apr 9;16:37. doi: 10.1186/s12886-016-0213-5
15. Aliomis ACFL, Lui Netto A, Lui Netto AF, Alves MR. .Efeitos de lente oftálmica com filtro de luz azul na astenopia induzida por computador. *eOftalmo*. 2020;6(3):51-5. 10.17545/eOftalmo/2020.0011
16. Recomendações sobre o uso saudável das telas digitais em tempos de pandemia da COVID-19. Grupo de Trabalho Saúde na Era Digital. Sociedade Brasileira de Pediatria. Disponível: https://www.sbp.com.br/imprensa/detalhe/nid/recomendacoes-sobre-o-uso-saudavel-das-telas-digitais-em-tempos-de-pandemia-da-covid-19-boas-telas-mais-saude/ Acessado: 20/11/2020.
17. Menos telas # mais saúde. Grupo de Trabalho Saúde na Era Digital. Sociedade Brasileira de Pediatria. Disponível: https://www.sbp.com.br/fileadmin/user_upload/_22246c-ManOrient_-_MenosTelas__MaisSaude.pdf Acessado: 20/11/2020.
18. Alves MR. Sobre a necessidade de se construir uma política nacional de saúde ocular para retardar o início e a progressão da miopia em escolares do ensino fundamental *eOftalmo*. 2018; 4(3):90-1.

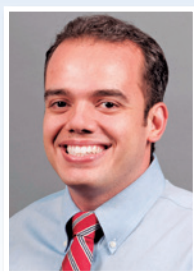
AUTHOR'S INFORMATION



» Milton Ruiz Alves

<https://orcid.org/0000-0001-6759-5259>

<http://lattes.cnpq.br/6210321951145266>



» Ricardo Noguera Louzada

<https://orcid.org/0000-0002-9610-5768>

<http://lattes.cnpq.br/5978866539118374>