



Hazardous Health Impact of Virtual Education during COVID-19

Abhisek Mishra^{1*}, Byomakesh Debata², Pooja Patnaik³, Bhawani Prasad Bag⁴
and Iswar Baitharu⁵

¹School of Management, Gangadhar Meher University, India.

²Department of Economics & Finance, BITS, Pilani, India.

³School of Business and Management, CHRIST University, India.

⁴Department of Biotechnology and Bioinformatics, Sambalpur University, India.

⁵Department of Environmental Sciences, Sambalpur University, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Short Communication

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ABSTRACT

The rapid spread of COVID-19 compelled the infected nations to close down their educational institutions to check the rigor of spread. In such context, to provide uninterrupted education to the students, virtual education through internet was widely adopted. This paper throws a light on how the students engaged in virtual education are exposed to various unexpected health perils due to the use of internet and smartphones. Moreover, this paper suggests taking a holistic approach through the introduction of "Yoga" in the course curriculum to avoid the unexpected health hazards.

Keywords: COVID-19; virtual education; health hazards; mental health; yoga.

1. INTRODUCTION

The world health organisation declared COVID-19 as a pandemic due to its rapid transmission [1]. To check the rigor of its spread, infected nations wisely took decisions for closure of educational institutions. In such scenario, providing uninterrupted education to the students was a monumental challenge. However, in mitigating the problem of providing continuous education to students, online or virtual classes through internet were introduced as the new line of teaching process. Cost-effectiveness and flexibility in conducting classes are the benefits of this format of teaching [2].

2. STUDENTS' EXPOSURE TO POSSIBLE HEALTH HAZARDS THROUGH ONLINE CLASSES

Notwithstanding the above advantages, exposure of students to various health hazards due to frequent use of internet in this new format of teaching is a major concern which cannot be overlooked. Because, it is reported that mobile operators providing internet facility use radio frequency waves ranging from 2-3 GHz [3], which is several fold higher than the prescribed safe frequency of 300 Hz or 30 KHz or 0.2 mT,[3]. Moreover, disturbed sleep is known to be the common health complaints among youths attributing to electromagnetic field (EMF) exposure [4]. Hyper tension, impaired immune system, cardiovascular disease, disorder of mood and loneliness are the resultants of inadequate sleep [5]. Further, enhancements in the blood glucose level, increment in the lipid level, and decline in the testosterone level are reported due to the augmented exposure to EMF [6]. In addition to the above health issues, different epidemiological studies have also established the association between exposure to electromagnetic field and risk of cancer, leukemia and tumors [7,3]. Computer vision syndrome (CVS, a spectrum of clinical vision related symptoms) is the resultant of prolonged use of visual display terminals (VDTs) like computers, smart phones and televisions. Students are engaged in the online classes either through computers or smart phones. In that case, they are also exposed to symptoms of CVS like dryness & irritation and blurred vision [8]. Along with the above health perils, online mode of teaching has several disadvantages like Ineffective teaching practices and lowered quality of interactions [9].

Empirical studies conducted in China [10], Japan [11], United States [12], Turkey [13], and India

[14,15] report various vision related problems like dryness of eye, declined vision, eyes hurting and eyestrain due to frequent exposure to VDTs. Further, studies [16-18] report that use of smart phones for more than two hours daily increases the incidence of Digital-eye-strain¹ among children. Moreover, association between use of internet and poor mental health and depression are also evident [19-21]. The above description depicts two scenarios; first, the use of internet is inevitable for educating the students in the present pandemic situation. Second, it will affect the mental health of students due to stress and disturbed sleeps caused by excessive use of internet and frequent exposure to VDTs for hours together, which may further damage their physical health [10].

3. IMPORTANCE OF PHYSICAL ACTIVITIES IN PROVIDING MENTAL AND PHYSICAL WELL-BEING

Physical activity and fitness (both mental and physical) of a student affect their cognitive function and academic performance [22]. Therefore, students' engagement in various physical activities for specific hours in a week as a part of course curriculum is evident in developed countries like Germany, France, Ireland, Spain and United Kingdom [23]. During the ongoing pandemic situation, where the restrictions on movements are imposed, it becomes difficult for students being engaged in physical activities. Thus, considering the importance of mental and physical health in academic learning, educational institutions should adopt a holistic approach other than physical activity in the present pandemic situation.

4. YOGA: A HOLISTIC APPROACH IN PROVIDING MENTAL AND PHYSICAL WELL-BEING

Yoga is an ancient practice that provides an art of living in maintaining healthy and peaceful life. It has also been considered as a therapeutic intervention with many psychological and physiological benefits since early 20th century. Metaphorically, Yoga comprises eight aspects or limbs such as disciplined life (*yama* and *niyama*), physical posture (*asana*), breathing regulation (*pranayama*), sense control (*pratyahar*), concentration (*dharana*) and bliss (*samadhi*).

¹ A term used to explain all aspects of eyesight problems aroused due to long term exposure to digital screen.

Amongst all, *pranayama* has been given more importance in *ashtanga* Yoga for maintaining good health [24]. *Kapalabhati*, *anulomaviloma*, *bastrika*, and *bhramari* are the mostly used yogic breathing practices. The yogic breathing practices are effectively helpful in stress reduction, cardiovascular and blood pressure related disorders [25,26]. Realising the importance of yogic practices in providing mental and physical wellness, 'Yoga' can be introduced in the course curriculum during the online classes to avoid the unexpected health perils. The next prime concern is how yoga can be implemented in the virtual education system? From a survey on students' response on online classes it is evident that students' prefer to have each online class with a duration less than 40 minutes and a break of 10-20 minutes between each class to make the online classes more interactive and informative [15]. Therefore, in the break time, students can be engaged in performing *Kapalabhati*, *anulomaviloma*, and *bhramari* are pranayama for 10 minutes (3 minutes each). Further, before introducing this practice, students should be well aware of the benefits of yoga and the objective of doing that; because awareness helps in learning and enhances the efficiency in performing a task.

5. CONCLUSION

Thus, in a nut-shell, this paper concludes with the suggestion of introducing yoga in the break time for addressing unexpected health threats faced by the students engaged in virtual education system.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Patra et al. Emerging molecular prospective SARS-CoV-2: Feasible nanotechnology based detection and inhibition. *Frontiers in Microbiology*; 2020. DOI:<https://doi.org/10.3389/fmicb.2020.02098>.
2. O'Neill K, Singh G, O'Donoghue J. Implementing eLearning Programmes for Higher Education: A Review of the Literature. *Journal of Information Technology Education*. 2004;3:313-323. DOI:<https://doi.org/10.28945/304>.
3. Moradi et al. Effect of ultra high frequency mobile phone radiation on human health. *Electronic Physician*. 2016;8(5):2452-2457.
4. Schreier N, Huss A, Roosli M. The prevalence of symptoms attributed to electro magnetic field exposure a cross sectional representative study in Switzerland. *SOZ Praventivmed*. 2006;51: 202-209.
5. Worley SL. The Extra ordinary Importance of Sleep: The detrimental effects of inadequate sleep on health and public safety drive on explosion of sleep research. *P&T*. 2018;43(12): 758:763.
6. Barsam et al. Effect of extremely low frequency electro magnetic exposure on sleep quality in high voltage substations. *Iranian Journal of Environmental health Sciences & Engineering*. 2012;9(15):1-7.
7. Brown M. *Power supply cookbook*. 2nd ed. Boston Oxford Johannesburg Melbourne: New Delhi Publication; 2001.
8. Mehra D, Galor A. Digital screen se and dry eye: A review. *Asia Pacific Academy of Ophthalmology*; 2020.
9. Dumford AD, Miller AL. Online learning in higher education: exploring advantages and disadvantages for engagement. *Journal of Computing in Higher Education*. 2018;30:452-465.
10. Zheng Y, et al. Internet use and its impact on individual physical health. *IEEE Access*. 2016; 4:5135-42.
11. Uchino M, Schaumberg DA, Dogru M, et al. Prevalence of dry eye disease among Japanese visual display terminal users. *Ophthalmology*. 2008;115:1982-1988.
12. Dana R, Bradley JL, Guerin A, et al. Estimated prevalence and incidence of dry eye disease based on coding analysis of a large, all-age United States health care system. *American Journal of Ophthalmology*. 2019;202:47-54. DOI:<https://doi.org/10.1016/j.ajo.2019.01.026>
13. Kaya H. Investigation of the effect of online education on eye health in Covid-19 pandemic. *International Journal of Assessment Tools in Education*. 2020;7(3):486-496. DOI:<https://doi.org/10.21449/ijate.788078>
14. Ichhpujani P, et al. Visual implications of digital device usage in school children: a cross sectional study. *BMC Ophthalmology*; 2019.
15. Singh HK, et al. A survey of E-learning methods in nursing and medical education

- during Covid-19 pandemic in India. Nurse Education Today. 2021;99. April, DOI:<https://doi.org/10.1016/j.nedt.2021.104796>
16. Moon JH, Lee MY, Moon NJ. Association between video display terminal use and dry eye disease in school children. Journal of Paediatric Ophthalmology & Strabismus. 2014;51:87–92. DOI:<https://doi.org/10.3928/01913913-20140128-01>
 17. Moon JH, Kim KW, Moon NJ. Smartphone use is a risk factor for paediatric dry eye disease according to region and age: a case control study. BMC Ophthalmology. 2016;16:188. DOI:<https://doi.org/10.1186/s12886-016-0364-4>
 18. Kim J, Hwang Y, et al. Association between exposure to smartphones and Ocular health in adolescents. Ophthalmic Epidemiology. 2016;23(4). DOI:<https://doi.org/10.3109/09286586.2015.1136652>
 19. Bessiere K, Pressman S, Kiesler S, Krant R. Effects of internet use on health depression: A longitudinal study. Journal of Medical Internet Research. 2010; 12(1). DOI:<https://dx.doi.org/10.2196%2Fjmir.1149>
 20. Mars B, et al. Prospective association between internet use and poor mental health: a population based study. PLOS ONE. 2020;15(7). DOI:<https://doi.org/10.1371/journal.pone.0235889>
 21. Mylona I, et al. The impact of internet and video gaming addiction on adolescent vision a review of literature. Frontiers in Public Health. 2020;8:63. DOI:<https://dx.doi.org/10.3389%2Fpubh.2020.00063>
 22. Donnelly et al. Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. Medicine & Science in Sports & Exercises. 2016;48(6):1197-1222.
 23. Weichselbaum et al. Physical activity in schools across Europe. Nutrition Bulletin. 2012;37: 262-269.
 24. Kuppusamy et al. Effects of Bhramari Pranayam on health- a systematic review. Journal of Traditional & Contemporary Medicine; 2017. DOI:<http://dx.doi.org/10.1016/j.jtcme.2017.02.003> (accessed on 16 October 2020).
 25. Rajesh SK, Ilavarasu JV, Srinivasan TM. Effect of Bhramari Pranayama on response Inhibition: evidence from the stop signal task. International Journal of Yoga. 2014;7(2):138-141. DOI:<https://doi.org/10.4103/0973-6131.133896>
 26. Jain G, Rajak C, Rampalliwar S. Effect of Bhramari Pranayama on volunteers having cardiovascular hyper-reactivity to cold pressor test. Journal of Yoga & Physical Therapy 2011;1:102.

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