

# Survey of ocular and extraocular symptoms in medical students due to online classes due to coronavirus disease-19 lockdown in North West India

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Received: April 13, 2021; Accepted: June 19, 2021

## ABSTRACT

**Background:** The Coronavirus disease (COVID)-19 pandemic has resulted in an increase in the trend of continuing education through virtual mode in the form of online training and classes to benefit the medical students. This has led to an increase in the esthenopic symptoms among medical students. **Objectives:** This survey aims to find out the prevalence of ocular and extraocular effects of online classes provided by means of Google E classrooms which were started in mid-April month of year 2020 during lockdown. **Materials and Methods:** It was a cross-sectional study, conducted among medical students who are pursuing MBBS in a medical college. The data were collected over a period of 4 months with the means of a questionnaire filled by medical students (mean age – 22.06 years) through online platform. This study does not involve administration of any kind of drug to any human being; hence, the scientific committee of our department has approved this study without any need of an ethical clearance. P value was calculated by SPSS software to analyze the data. **Results:** Sample size was of 200 students, 52.5% of whom were females. The statistical analysis revealed that the eye fatigue ( $P = 0.00$ ), watering of eyes ( $P = 0.01$ ), burning or itching sensation ( $P = 0.01$ ), and headache ( $P = 0.006$ ) were the most significant ocular symptoms experienced by medical students. Whereas among systemic symptoms, day time sleepiness ( $P = 0.001$ ) and shoulder ache ( $P = 0.02$ ) were most commonly experienced by medical students. **Conclusion:** The upcoming trend of education through online classes due to COVID-19 lockdown has caused an increase in ocular and extraocular symptoms among medical students, which needs to be managed properly.

**KEY WORDS:** Coronavirus disease-19; Lockdown; Ocular Symptoms

## INTRODUCTION


Although e-learning is not a new phenomenon, the outbreak of Coronavirus disease (COVID)-19 and the country going under lockdown shifted the whole education system into a virtual mode. At present, during consultation with patients, we get to see a lot of medical students coming with the complaints of eye fatigue, headache, watering eyes, burning, and itching sensation in eyes<sup>[1]</sup> that might be contributed to an

increase in the screen time of students due to the lockdown in the country due to COVID-19 pandemic. Computer vision syndrome was the most common diagnosis (25.9%), followed by conjunctivitis (17.7%) according to a recent report.<sup>[2]</sup>

This study aims to find out the most prevalent ocular and extraocular symptoms that disturb the medical students after spending a good amount of screen time for their classes. A knowledge of these symptoms will help in efficient management of these symptoms.

## MATERIALS AND METHODS

Students of all the professional years in MBBS of age group 19–25 years were provided a questionnaire (Appendix 1) through online platform during a period of 4 months from May

Access this article online	
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DOI: 10.5455/ijmsph.2021.04032202119062021	

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1, 2020, to August 31, 2020. The questionnaire consisted of three sections. First section dealt with the mode of attending online classes and time spent in it. The second section was concerned with the ocular effects namely headache, dryness of eyes, watering, redness, burning or itching sensation, glare, double vision, eye fatigue, change in color perception, contact lens discomfort, and slowness in changing focus. Third section asked about the extraocular effects namely backache, shoulder ache, sleep deprivation, and day time sleepiness.<sup>[3]</sup>

**Statistics**

*P* value was calculated by SPSS software to know the significance of each symptom developed in the students.

**RESULTS**

Out of 200 responses received, females (52.5%) were more than males [Table 1]. Mean age of students was 22.06 years. About 53 % of students were already myopic for both the eyes. 92 students (46%) attended online classes for 2–4 h whereas 23 students attended for <2 h, 73 students attended classes for 4–6 h, and 18 students attended online classes for more than 6 h. 92 students (47.3%) attended online classes daily except weekends. 134 students (67%) used smartphones to attend online classes whereas 62 students used laptop and 25 students used tablets. 88 students (44%) used online platforms for other recreational activities for an additional 2–4 h whereas 58 students used it for <2 h, 43 students used it for 4–6 h, and 13 students used it for an additional of more than six hrs. While attending online classes, students did not experience any significant increase in symptoms of dryness of eyes, light or glare sensitivity, redness, double vision, contact lens discomfort, and changes in color perception. However, they experienced significant eye fatigue (*P* = 0.00) [Figure 1], watering of eyes (*P* = 0.01) [Figure 2], burning or itching sensation (*P* = 0.01) [Figure 3], and headache (*P* = 0.006) [Figure 4]. Among systemic symptoms, day time sleepiness (*P* = 0.001) [Figure 5] and shoulder ache (*P* = 0.02) [Figure 6] were significantly experienced by medical students.

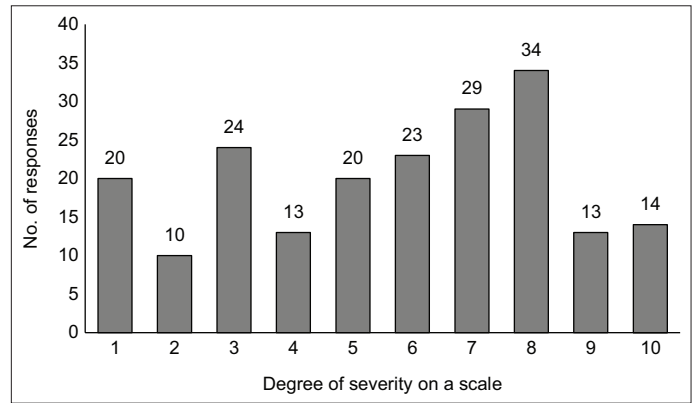
**DISCUSSION**

In this study, eye fatigue came out to be the most significant ocular symptom and day time sleepiness was the most significant extraocular symptom among medical students.

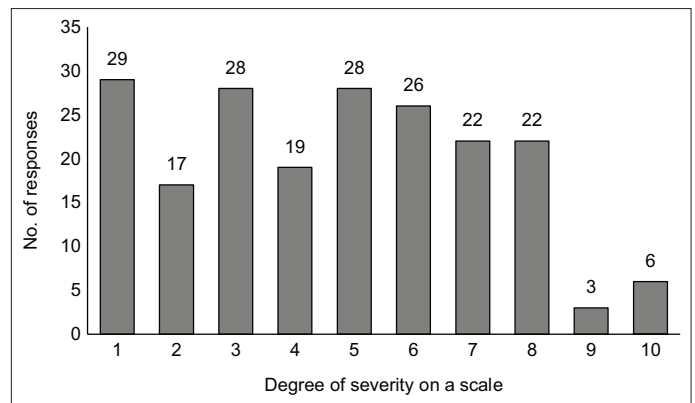
As noted above, increase in screen time on electronic devices during lockdown due to COVID-19 has led to increase in the

**Table 1:** Gender distribution

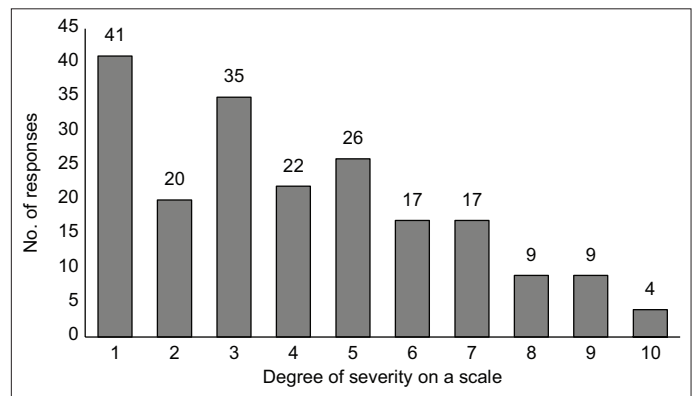
Gender	Frequency	Percent
Male	95	47.50
Female	105	52.50
Total	200	100.0



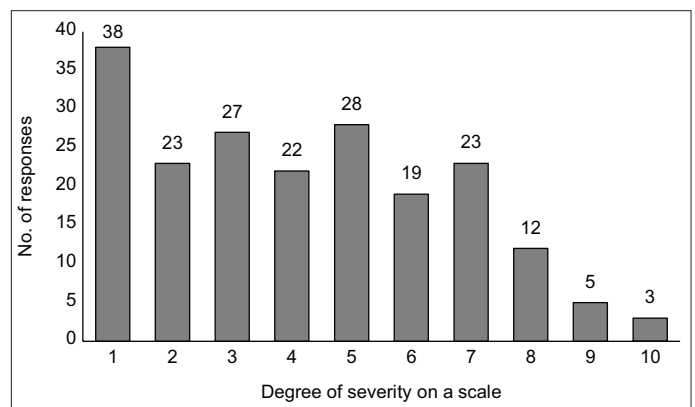
**Figure 1:** Degree of severity on a scale for eye fatigue



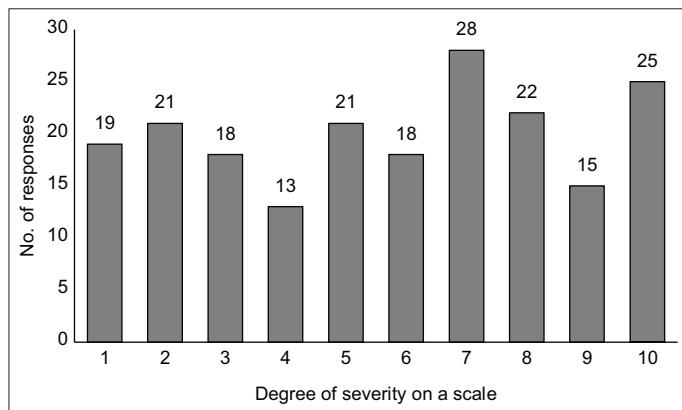
**Figure 2:** Degree of severity on a scale for watering in eyes



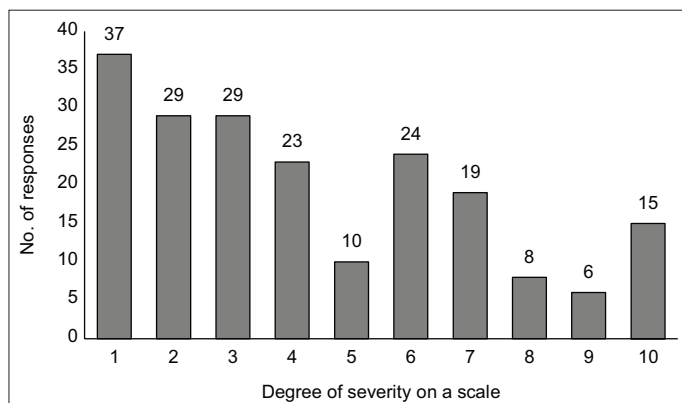
**Figure 3:** Degree of severity on a scale for burning or itching sensation in eyes



**Figure 4:** Degree of severity on a scale for headache



**Figure 5:** Degree of severity on a scale for daytime sleepiness



**Figure 6:** Degree of severity on a scale for daytime shoulder ache

symptoms of eye strain which is well established in other studies as well.<sup>[1,4]</sup> This has also lead to a disturbing effect on sleep quality.<sup>[5]</sup> More work needs to be done to specifically define the processes that cause these symptoms and to develop and improve effective treatments that successfully address these causes.<sup>[6]</sup> Lubricating eye drops and special computer glasses help relieve ocular surface-related symptoms as seen in other studies.<sup>[7-10]</sup>

This study is limited by the small sample size and recall bias by the participants in filling the questionnaire. This study is strengthened by the fact that analysis has been done after an authentic collection of the data. Furthermore, the findings of this survey can contribute in formation of a certain set of guidelines to improve the visual hygiene of medical students.

## CONCLUSION

Thus, from this study, it can be concluded that in modern digital world, an increasing use of electronic devices for both work and leisure activities has caused an increase in visual symptoms in the students. An inability to satisfy these visual requirements could present significant lifestyle difficulties for medical students.<sup>[3]</sup> The effect of inclusion of lifestyle modifications such as regular exercises and healthy diet by medical students needs to be studied to further come up with the appropriate solutions to the above symptoms. In most of the developed countries, there are recommendations issued by renowned medical

associations with regard to the definition, the diagnosis, and the methods for the prevention, treatment and periodical control of the symptoms found in computer users, in conjunction with an extremely detailed ergonomic legislation.

Eye fatigue and watering eyes were significantly experienced by students after starting online classes for which they were advised orthoptic exercises, lubricating eye drops, and special computer glasses. They have been advised to sit in a proper posture to avoid backache and shoulder ache. They were advised to sit in a well illuminated room, to take breaks in between after every 20 min for 20 s and to look at far off objects about 20 feet away to relax accommodation, to have an appropriate distance between them and screen and to go for regular eye checkups. In view of an increasing exposure to digital screens in day to day life of medical students, more guidelines and investigative efforts are needed to maintain visual health.

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**How to cite this article:** Bansal P, Manohar JM. Survey of ocular and extraocular symptoms in medical students due to online classes due to coronavirus disease-19 lockdown in North West India. *Int J Med Sci Public Health* 2021;10(1):114-117.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.

**APPENDIX 1****QUESTIONNAIRE****Section 1**

NAME (optional):

AGE:

GENDER:

EMAIL ID:

Ph no.(optional):

Refractive status of right eye- myope/hypermetrope  
Prescription for spectacles of right eye.

Refractive status of left eye-myope/hypermetrope  
Prescription for spectacles of left eye.

Q 1. How many hours of online classes do you attend daily?

- a. 2 h or less      b. 2 h–4 h  
c. 4h–6 h      d. >6 h

Q 2. What is the frequency of attending the online classes?

- a. Daily      b. Daily except weekends  
c. Weekends only      d. other (kindly mention)

Q 3. On which device do you attend online classes?

- a. Smartphone      b. Laptop  
c. Tablet      d. Any other (kindly mention).

Q 4. Except attending online classes, what is the screen time spent on other recreational activities such as movies, videos, online games, and projects?

- a. 2 h or less      b. 2 h–4 h

c. 4 h–6 h

d. &gt;6 h

Q 5. How much is the increase in the screen time due to above activities during lockdown as compared to the time before lockdown was implemented?

**Section 2**

Q 6. Mark the degree of severity on a scale of 1 to 10 (1 being the least severe and 10 being the most severe) if you experience following ocular symptoms since you are attending online classes –

- a. Headache
- b. Dryness of eyes
- c. Watering in eyes
- d. Redness in eyes
- e. Burning or itching sensation in eyes
- f. Light or glare sensitivity
- g. Double vision
- h. Eye fatigue
- i. Changes in color perception
- j. Contact lens discomfort
- k. Slowness in changing focus

**Section 3**

Q 7. Mark the degree of severity on a scale of 1 to 10 (1 being the least severe and 10 being the most severe) if you experience following extraocular symptoms since you are attending online classes –

- a. Back ache
- b. Shoulder ache
- c. Sleep deprivation
- d. Day time sleepiness