



## A Survey based Study: Usage of Electronic Devices and Ocular Manifestations during Quarantine (Covid-19) among Students

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### Abstract

**Purpose:** To evaluate the ocular manifestation due to electronic devices on the eye during a lockdown and ocular symptoms due to excessive use of devices for education purpose.

**Methods:** A self-made questionnaire about qualitative and quantitative usage of the electronic devices was completed by students attending online classes during the quarantine phase of pandemic COVID 19. All the data were gathered and analyzed using a statistical package for social sciences (Version 22).

**Results:** A total of 500 students were responded to this survey. The most common usage devices among students were 60% mobiles phone, 20% for laptops, and 20% for other electronic devices. 75% of students had eye strain after using devices at day end followed by 25% of students who had no ocular discomfort. There is a strong relation ( $p = 0.05$ ) between ocular manifestation and excessive use of the electronic device.

**Conclusion:** Eye health issues are emerging as electronic devices time increases for students due to institutes being closed and on-line mode of education started in the Covid-19 pandemic. As there is a strong association between usage of electronic devices (smartphones and laptops) and ocular manifestations including blurriness of vision, burning sensation in eyes, headache, and strain in eyes.

**Keywords:** Electronic Devices; Laptop; SmartPhones; Ocular Manifestations; COVID19; Quarantine; Pandemic; Survey

### Introduction

COVID 19 made very changes in many features of diurnal life. This contagious disease Corona Virus has deeply affected globally. World Health Organisation declared COVID19 as a Pandemic global public health emergency [1]. COVID disrupts the normal functioning of life in many aspects. This pandemic affects schools,

colleges, and universities to remain closed temporarily. Despite all, Education becomes much affected during covid. While lockdown, students resist becoming at home and study from home. This becomes very challenging throughout to world to change the mode of education from classrooms to online mode of teaching and learning with the distinctive rise of e-learning via different applications i.e. google classrooms, zoom, google meet, etc.

We are living in a modern era with advancement which leads toward the digitalization of small things to all, leaving nothing unharmed from its path. Our society is telling about the future where digital devices are a vital part of our life, such as e-books that alter the old books and paper throughout the world. In electronic devices, a soft form of the book has changed the way information is formed, spread, and shown throughout the universe. Electronic books are present in all electronic devices that can install and shown in the software of devices, describe one of many benefits that are preferred by old papers and books. The advantage of new technologies includes but is not limited to change the font size of the subject or text, in devices soft forms of books are 60% cheaper than the older books, electronics books storage capacity is unlimited we can install the complete library in our devices. Every person in this era used e-books for education purposes and also for communication [2]. One of the main current conditions in our society is that electronic devices are a vital part of our daily lives and are relying on them for our daily life tasks. Mobiles are easy to carry that contains many functions consist of often facilitating communication as, camera, global positioning system, phone, MP3 players [3]. Electronics devices are also used in multiple scientific tasks and can help those persons who cannot compensate for their physical abnormality with motion and verbal activated applications are present in devices. However, the internalization of mobile phones to every person in society has arisen many health problems. Electronic devices have caused many serious psychophysical health problems in the whole world. More use of electronic devices does not effect on mental health, but also have a physical issue. Such as decreased distance vision, dry eyes, stiffness neck muscles, wrist, and back pain. asthenopia symptoms are induced by spending more time on screen [4]. Asthenopic symptoms are also called as computing vision syndrome because it is caused by excessive use of electronic devices such as mobile phones and computer screens [5,6].

**Materials and Methods**

Students from the Isra School of Optometry and the University of Faisalabad, who underwent online mode of education during quarantine or lockdown were included in this survey. Data were collected by using a self-made questionnaire on Google classroom. The questionnaire link was sent to the students by creating Google classroom. Students asked to complete the survey online. The survey form was based on questions regarding the usage of electronic devices and associated discomfort. Data analysis was done on the

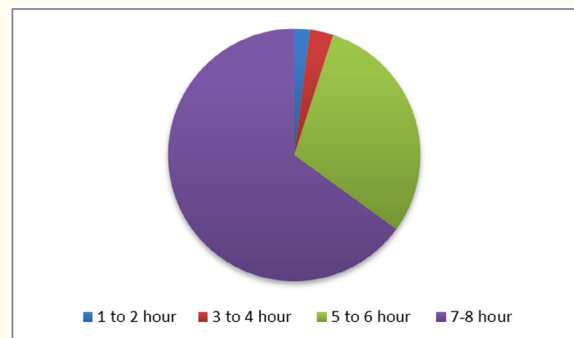
statistical package for social science (SPSS) version 20.0. Statistical changes were present in the form of charts, frequency, etc.

**Results**

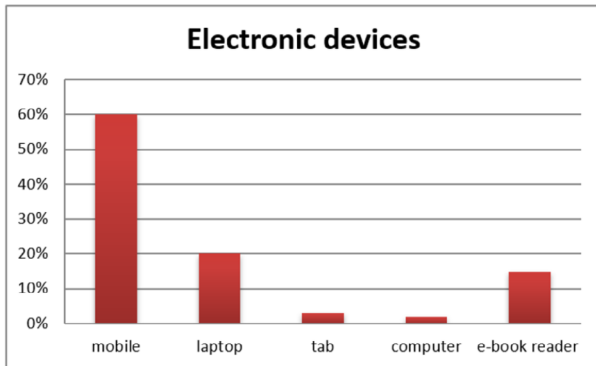
The study included 500 students with the age group from 20 to 25 years old. 95% of students were using electronic devices on daily basis (Graph 1). Out of them, 65% of students spent time 7 - 8 hours on devices, followed by 30% spent 5 - 6 hours, 3% 4 hours, and 2% 2 hours daily (Graph 2). Most students 60% had mobile phones, followed by 20% had laptops and 20% had different gadgets (tabs, computers, etc) (Graph 3). The majority of them responded that they had their devices for educational purposes. Students felt blurriness of vision, also headache and eye strain (60%, 70%, 75%) respectively (Graph 4). 60% of students responded that they had a very close working distance of 25 cm, followed by 30% who had less than 25 cm, only 10% had 60 cm usually called arm's length distance.



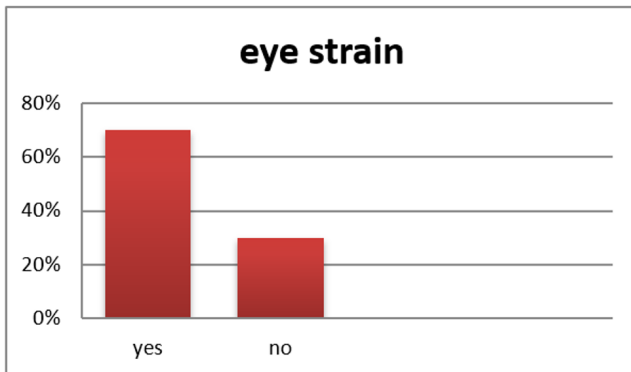
**Graph 1:** How often do you use these electronic devices?



**Graph 2:** How much time students spend on electronic devices?



Graph 3: Device usage?



Graph 4: Ocular eye strain during usage of electronic devices.

**Discussion**

According to a current study, fourteen percent of middle school going students has electronic device addictions [7].

A study was conducted that children with the age of 8 - 18 years students spend almost one-third of their day using mobile screens. Maximum of their times spent watching mobile phones, TV and playing video games on computers or mobiles [8]. Children spending most of the time on screens, it has become a very important concern for their parents and eye practitioner such as optometrist and ophthalmologists can manage that burden of ocular manifestation will greatly increase [9].

<b>1. How often do you use these electronic devices?</b>			
1 - 2 times (week)	3 - 4 times (week)	Everyday	
2%	3%	95%	
<b>2. Spends time on electronic devices?</b>			
1 - 2 hours (day)	3 - 4 hours	5 - 6 hours	7 - 8 hour
2%	3%	30%	65%
<b>3. Which of the following device do you use?</b>			
Laptop	Mobiles phone	Others	
20%	60%	20%	
<b>4. Students Use device at distance?</b>			
25 cm	Less than 25 cm	At arm length	
60%	30%	10%	
<b>5. For what purpose use?</b>			
Education purpose	For social	Others	
55%	25%	20%	
<b>6. Does the student feel blurriness while using the device?</b>			
Yes		No	
65%		35%	
<b>7. Does student the feel a headache while using the device?</b>			
Yes		No	
70%		30%	
<b>8. Does the student feel burning while using the device?</b>			
Yes		No	
60%		40%	
<b>9. Does the student feel eye strain while using the device?</b>			
Yes		No	
75%		25%	
<b>10. Students use mobile at bedtime when the light switched off?</b>			
Yes		No	
80%		20%	

Table 1: Descriptive statistics.

A study was conducted in a population by comparing the LCD with ink print. In a research 3 different sessions were conducted separated by almost 10 days [10]. In sessions of long term reading that was greater than one hour and both persons with LCD and ink print tested for asthenopic symptoms at the test and end of the ses-

sions. Research data was gathered and analyzed. The person who used LCD has high ocular fatigue [11].

### Conclusion

This study concluded that there were discomfort emerging issues emerging as electronic devices time increases for students due to institutes being closed and online mode of education started in the Covid-19 pandemic.

### Recommendations

Knowledge should be spread to students and teachers while online education that Students should maintain proper distance while using electronic devices. Every student should follow the rule of vision 20/20 which means after every 20 minutes of work, the person should look at the distance of 20 meters for 20 seconds, which reduces the eye strain. And do not use any electronic devices in dim light because it leads to induce myopia and dry eye issues.

### Conflict of Interest

None.

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