



Ophthalmology

“EVALUATION OF EYE STRAIN AND DRY EYES DUE TO EXCESSIVE SCREEN USASGE AFTER THE PANDEMIC AND INCREASED WORK FROM HOME CULTURE.”

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ABSTRACT Dry eye is a multifactorial disease. The use of computers and other screens-on gadgets reduces the amount of eye blinks, which causes incomplete blinking, tear evaporation, and ultimately dry eye illness[1]. Evaporative dry eye illness is the most prevalent kind, and computer use is especially significant in this group. The American Optometric Association has identified computer vision syndrome, often known as digital eye strain, as an eye and vision issue experienced by frequent computer, tablet, and mobile phone users.[2] In this study, we evaluated the results of the Schirmer test, tear break-up time, OSDI scores which are the parameters of dry eye disease related to a long-term computer use, in order to identify the points to be noted with regard to use of devices with screen displays important for this public health problem. **Objective:** Current study aims to observe and study the impact of increased digital device uses on ocular and visual symptoms associated with them after the COVID-19 pandemic in a tertiary care hospital. **Methodology:** An observational study conducted amongst 250 individuals aged 18 and above, who presented with symptoms of dry eyes and had excessive screen use. **Conclusion:** Digitalisation has led to a drastic increase in prevalence of digital strain. There is need for reduction in screen time along with increase in awareness regarding proper use of digital gadgets for prevention of this epidemic.

KEYWORDS : Digital Eye Strain (DES), Computer Vision Syndrome (CVS), Dry eyes.

INTRODUCTION:

A significant portion of our population was indoors throughout the COVID lockdown, using digital platforms for work, play, and enjoyment.

The rate of Digital Eye Strain, commonly known as Computer Vision Syndrome and Dry eye symptoms, has increased due to the greater usage of digital screens in lockdown.

Long-term exposure to the digital rays from digital devices is linked to changes in tear film stability, mucin concentration, reduced eye blinking, and increased tear evaporation, all of which can injure the ocular surface^[1,2,3].

Hence, CVS-related vision issues and ocular discomfort are lowering performance and productivity at work place as well as affecting the quality of life of computer users^[4].

The retinal cells are damaged by the high energy waves emitted by these gadgets, leaving users susceptible to a range of eye issues.^[5]

Unknowingly, the introduction of unrestricted online lessons has increased the strain on students' eyes.

Eye strain, dry eyes, headaches, impaired vision, and neck or shoulder pain are common symptoms that frequently get worse the more time is spent using digital devices.^[6,7]

The purpose of this study was to determine the frequency and severity of digital eye strain among patients who attended their opd appointments at a tertiary care facility.

The goal of the study is to raise awareness among eye-care professionals, educators, and policymakers so that they may develop and put into action an interventional approach to reduce the symptoms of Digital device use.

AIMAND OBEJECTIVE:

Current study aims to observe and study the impact of increased digital device uses on ocular and visual symptoms associated with them after the COVID-19 pandemic in a tertiary care hospital.

METHODOLOGY:

- An observational study conducted amongst 250 individuals aged 18 and above, who presented with symptoms of dry eyes and had excessive screen use.
- A structured questionnaire was given to all participants and informed consent was taken.

- The questionnaire included questions pertaining to: duration of online studies refractive status of eye type of gadget used distance of viewing role of other factors symptoms observed related to dryness

Tests like tear film break up time (TBUT) and schirmer's test and ocular surface disease index (OSDI)^[5] were also done to rule out symptoms of dry eyes due to excessive screen use.

RESULTS:

- The majority of people were observed using two or more digital devices during the pandemic lockdown (70%) (TV and mobile phones being the most common ones).
- Mobile phones saw the most digital use (90%).
- More than 4 hours of digital device use was being done by about 30% of users in dimly lit or darkened areas.
- Over 10 hours a day on a screen was used by 25% of people.
- The following symptoms, such as headache, eye strain, dryness, and redness, and increased daily hours spent using digital devices during lockdown, were found to be positively correlated:
- In the study population out of 250 people, 155 people had various device use for 4-6 hours, 60 people had various device use for 6-8 hours and 35 patients had device use of more than 10 hours.
- The following figure shows symptoms and related percentage seen in study population:

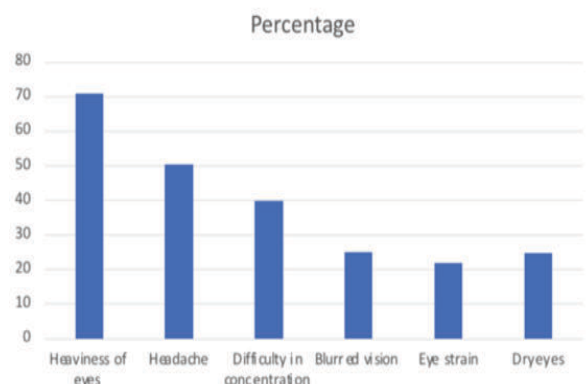


Figure No. 1: Graphical representation of symptoms and their percentage.

Tabular Representation:

Table no. 1 : Symptoms and their percentage in study population using devices > 6hours

SYMPTOMS	PERCENTAGE
Heaviness / tiredness of eyes	70.8
Headache	50.8
Blurred vision	25
Dry eye	24.7
Eye strain	22
Glare discomfort	20.6
Irritated eyes	10

The following table shows the tear film breakup time in the study population:

Table no. 2: Tear film breakup time in the study population.

Tear film breakup time	Results
> 10 seconds	158 people
5-10 seconds	62 people
<5 seconds	30 people

The following table shows the results of schirmer's test performed on the subjects:

Table no. 3: schirmer's test results in study population

Schirmer test	Results
>15 mm in 5 minutes	100 people
< 5 mm in 5 minutes	15 people

Schirmer's test was within normal limits in majority of study population, which meant the dry eye was due to evaporation of tears (evaporative type) rather than due to decreased secretion.

The following table shows the OSDI scores in the study population

Table no. 4: OSDI scores in the study population

Osdi scores	Results
0-12	140 people
13-22	67 people
23-32	33 people
>33	10 people

These findings suggest that when exposure time to digital or computer screens lengthens, dry eye problems worsen.

DISCUSSION:

After the COVID- 19 outbreak, the usage of devices for online literacy and enjoyment has significantly increased. In this study, the prevalence of digital eye strain (DES) was estimated, the pattern of gadget operation was described, and the risk factors for DES were examined. In a study by Patil SD et al, the mean OSDI score was lesser in cases who used computers for more than six hours per day as opposed to subjects who used computers for 4- 6 hours per day^[5]. The study of Gajta A et al, also verified that working on a computer for longer time significantly increases the threat of DED^[9]. Digital eye strain (DES) or computer vision syndrome as defined by the American Optometric Association encompasses a range of visual and optical symptoms arising due to the prolonged use of digital electronic devices.^[10] Due to the rapid advancements in internet and digital device technologies over the past ten times, further people are using gadgets. Sarwar et al. showed that laptop/ desktop shipment increased from 200 million units in 2005 to 400 million units in 2013. Similarly, shipment of smartphones increased from lower than 100 million units in 2005 to nearly 800 million units in 2013.^[11] After analysing the symptoms, it was clear that respondents who spent more than six hours using digital devices constantly endured watery, dry, and red eyes, as well as eye pain and strain. Shoulder, back, and headache discomfort are examples of systemic symptoms.^[12] The two main non-ocular symptoms were concentration problems (40 percent) and sleep issues. It's necessary to take action to treat the symptoms of digital eye strain, also known as computer vision syndrome, which is a classic example of a lifestyle-related health problem that can be avoided. People need to be made aware of the various ergonomic practices to help digital eye strain as follows:^[13]

Your face should be at least 25 inches down from your computer screen, which should be at arm's length down.^[14] The screen's centre should be deposited 10 to 15 degrees below eye position.^[15] To revive your eyes, use artificial tear substitutes. The room you're utilising should have acceptable illumination. Give your eyes a break by wearing spectacles if you constantly wear contact lenses.

Regularly check your eyes. A different set of spectacles with antiglare properties may be needed if you are using a computer.^[16] Device should be made light free by using matte screen pollutants.

20-20-20 rule should be followed : Every 20 minutes, look at an object 20 feet down, for atleast 20 seconds. For those working from home, a new " office space " with a proper screen positioning, table height, ergonomic seating arrangements, and optimal lighting will lessen the strain on the eyes while also helping to avoid issues caused by bad posture. Podcasts can be preferred over videotape classes to exclude the visual strain.

CONCLUSION:

In conclusion, a increase in the use of gadgets during the pandemic has led to increase in screen time and consequent eye strain. This study aims at providing information on reducing the total screen time and on the ergonomic use of gadgets to avoid eye strain Health practitioners should communicate information about CVS and accompanying discomfort as well as prevention techniques because we rely on digital screens for many daily activities, especially after lockdown. Those who have had eye disorders in the past and those whose jobs require lengthy screen exposure should take extra precautions to prevent DES. At this crucial time, studies to evaluate ocular strain in youngsters (under the age of 18) are also necessary since they represent another population that could be at risk.

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