



ASSESSMENT OF DRY EYE & ITS AWARENESS AMONG STUDENTS IN ITM UNIVERSITY, GWALIOR

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Abstract

Introduction: Assessment of visual performance are more crucial among all age group especially in young adults. It is common that maximum students have digital gadget like mobile, phone, tab, laptop etc. For many reasons they have to use all these gadgets after the emergence of COVID pandemic. Dependency in digital gadgets has importantly increased due to shifting of Education mode from offline to online, in this study we tried to find out the outcomes of digital screen usage identify the occurrence of dryness and its awareness in young adults of age group 18-30 years if ITM University, Gwalior.

Purpose: To study occurrence of dryness and its awareness after prolonged usage of digital gadgets.

Methods: A cross sectional study in which we enrolled 60 young adults and their data were collected via questionnaire from the selected subjects. Ocular examination and Schirmer test-1 was performed.

Results: A total of 60 young adults aged 18 to 30 years old participated in this study, with 60% (35) being male and 40% (25) being female. Most of the participants were using mobile phone among the entire digital gadget. The majority of participants 43.3 % (26) spending 4-6 hours and 41.7% (25) spending 2-4 hours, while the least amount of time spent was 6-9 hours. The most experienced symptoms were burning sensation experienced by 56.7%, irritation 55%, dryness 20%, headache 18.3%, eyepain 16.7%, redness 15% and 11.7% were suffering from all the mentioned symptoms. precautions for dryness and related symptoms are unknown to 95 % (57 out of 60) of students, while only 5% (3 out of 60) were aware.

Conclusion: Excessive use of a digital screen causes dryness-related symptoms in the eyes of students, particularly those who are unaware of how to control dryness-related symptoms we can control dryness and related symptoms with a few simple preventive measures, finally, we must enlighten them about dry eyes and how to prevent the using various methods.

Keywords: digital screen, gadgets, awareness, ocular, effect, young adults

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1. Introduction

In recent years, the widespread adoption of digital devices has transformed the way we live, work, and communicates. From smart phones to tablets, laptops to desktop computers, digital screens have become an integral part of our daily lives. The emergence of the COVID-19 pandemic has brought about unprecedented changes in our daily lives, including a significant increase in digitalization. However, the increased use of digital screens among young adults has raised concerns about potential adverse effects on eye health, particularly regarding dryness and discomfort.

Young adults are among the most frequent users of digital devices, spending countless hours engaged in activities such as studying, working, socializing, and entertainment that require prolonged screen time. While digital screens offer convenience, productivity, and connectivity, they also expose the eyes to unique challenges, one of which is the development of dry eye symptoms.

Dry eye syndrome occurs when the eyes do not produce enough tears or when the tears evaporate too quickly, resulting in a range of uncomfortable symptoms. The extended periods of screen use often lead to reduced blink rate and incomplete blinking, which can exacerbate the risk of dryness and discomfort in the eyes.

Understanding the impact of digital eye screen use on dryness in young adults is crucial, as this demographic is particularly vulnerable due to their extensive reliance on digital devices. This issue can have significant consequences, affecting not only visual comfort but also productivity, quality of life, and overall eye health.

In this discussion, we will explore the relationship between digital eye screen use and dryness in young adults of ITM University, Gwalior. We will delve into the factors contributing to dryness, examine the potential mechanisms behind its development, and highlight effective strategies for managing and mitigating dry eye symptoms. By increasing awareness and providing practical solutions, we aim to empower young adults with the knowledge and tools necessary to maintain healthy eyes while engaging with digital technology.

Dry eye

Dry eye disease is a common problem that occurs when your tears are unable to adequately moisten our eyes. For a variety of reasons, tears may be insufficient and unsteady. If you don't have

enough tears or having tear with poor quality can results in dry eye. Tear in stability can cause dryness and further inflammation which can damage to the ocular surface.

Dry eye can occur due to variety of conditions like over exposure of air-conditioned room, prolonged usage of digital gadgets without blinking much, exposure to extreme hot climates and various systemic illnesses. Treatments for dry eyes may help you feel better. Lifestyle adjustments and eyedrops are examples of these treatments. To control the symptoms of dry eye, artificial tears, to follow 20-20-20 rule, nutritional supplements, eyelid hygiene, avoid smoking and drinking alcohol, blinking exercises and to avoid irritants.

Digital screen and dry eye

Screen time has become an accepted component of most individual's daily life. The time you spend focusing on a screen, whether on a smart phone, tablet, laptop, or other device, may frequently be felt in your eyes.

How using digital devices can lead to dry eye syndrome

The use of computers and other display devices with screens reduces the amount of eye blinks, resulting in partial blinking, tear evaporation, and dry eye conditions. Evaporative dry eye disease is the most common kind, and computer use is especially relevant in this group.

Tips to protect your eyes from dry eye syndrome

Here are some recommendations for managing the dry eye syndrome when using digital device:

- Blink frequently
- Use a cool-mist humidifier at workplace.
- When using a fan or air conditioner, avoid blowing air directly into your face.
- Drink plenty of water, fresh fruit or vegetable juices, milk, or soups to stay hydrated.
- Water-based dairy products, such as yoghurt, smoothies, and oats, should be consumed.
- If necessary, use artificial tears or prescription eye drops.

Objective: To study dryness and awareness due to digital screen use in young adults of ITM University, Gwalior.

Review of literature

Zaina Al-Mohtaseb, in his article "The Relationship between Dry Eye Disease and Digital Screen Use" stated that increased use of digital screens for work, communication, and entertainment, especially during times of pandemic, may contribute to dry eye. Smartphone use duration has also been found to be greater in

school-age children with dry eye disease than in those without dry eye disease. Rozalina Loebis. In an article "Correlation between the exposure time to mobile devices and the prevalence of evaporative dry eyes as one of the symptoms of computer vision syndrome among Senior High School students in East Java, Indonesia" states that, the risk of developing evaporative dry eyes, as one of the symptoms of CVS in young age with normal tear production, could be induced even with minimal exposure to mobile devices. Sukanya Jaiswal. In an article "Ocular and visual discomfort associated with smart phones, tablets and computers: what we do and do not know" stated that between 2011 and 2015, the use of smart phones by Australian teenagers increased from less than 25% to 80%. However, ocular surface discomfort includes sore eyes, dryness, stinging, burning, itchiness and irritation. Pratyusha Ganne. In an article "Digital Eye Strain Epidemic amid COVID- 19Pandemic" stated that the prevalence of eye strain was higher among students taking online classes compared to the general public. There was an increase in screen time during the pandemic compared to pre-pandemic time.

2. Methods

Across sectional study was conducted at Dept. Optometry, ITM University Gwalior. A total of 60 students of ITM University, Gwalior of age group 18-30 years were enrolled in this study. Ocular examination along with Schirmer test-1 were conducted, A questionnaire administered to subjects consisted of digital screen usage time, type of digital Screen, average times spent on digital screen and awareness about the problems were also collected from those subjects. Detailed history was taken for each subject which included ocular history, family history, systemic history, history of any trauma as well as history of any allergy. Also, subjects were asked about any previous ocular diagnosis and any documents they were having for that. At the same time, they were also asked about the chief complaints they had at that time. Visual Acuity was assessed using distance Bailey-Lovie chart: designed with constant size progression ratio, each row having the same number of letters. Anterior segment of eye was assessed by using Zeiss SL 800 slit lamp, Lids, conjunctiva, cornea, anterior chamber angle, iris, pupillary reaction and its contour etc. Schirmer's test -1 was performed to identify the severity of dryness. Whatmann filter paper no

41 were used for performing Schirmer's test-1.

Inclusion criteria:

- Subjects those who are a regular user of digital gadgets
- Age group of 18-30 years, both male and female.
- Subjects without any systemic disorder and any other ocular disease condition

Exclusion criteria:

- Contact lens wearer
- Regular smokers
- Consumption of alcohol
- Prior refractive surgeries (LASIK, PRK, PK etc.)

Collected data were analyzed through graphical representation by using SPSS Modeler 16.0.

3. Result

A total of 60 young adult students aged 7 to 17 years old participated in this study, with 60% (35) being male and 40% (25) being female and studying in undergraduate & post graduate. The majority of the participants were students of graduate program and rest of them from post graduate program. The mobile phone was the most widely used digital gadget. 53 out of 60 students (88.3%) were using cell phone, with the majority of participants 43.3 % (26) spending 4-6 hours and 41.7 % (25) spending 2-4 hours, while the least amount of time spent was 6-9 hours. 11.4% (7) and 3.3% (2 out of 60) for more than 12 hours. 41.7% (25) of those surveyed wear spectacles, whereas 58.3% (35) do not wear spectacles or contact lenses. 90.1 % 52 of the 60 participants exhibited one or more symptoms that affected the eye and caused dryness. The most experienced symptoms were burning sensation experienced by 56.7%, irritation 55%, dryness 20%, headache 18.3%, eye pain 16.7%, redness 15% & 11.7% suffer from all the mentioned symptoms. We performed the Schirmer's test 1 test to identify the severity of dryness. Our data showed 46.7 % (28 out of 60) of the participant have more than 15 mm wetting of the Schirmer's strip, 36.3% (26 out of 60) have 10-15 mm wetting, and least 15 % (9 out of 60) have 0-5 mm wetting of strips. Precautions for dryness and related symptoms were unknown to 95% (57 out of 60) of students, while only 5% (3 out of 60) were aware of dryness and its complications.

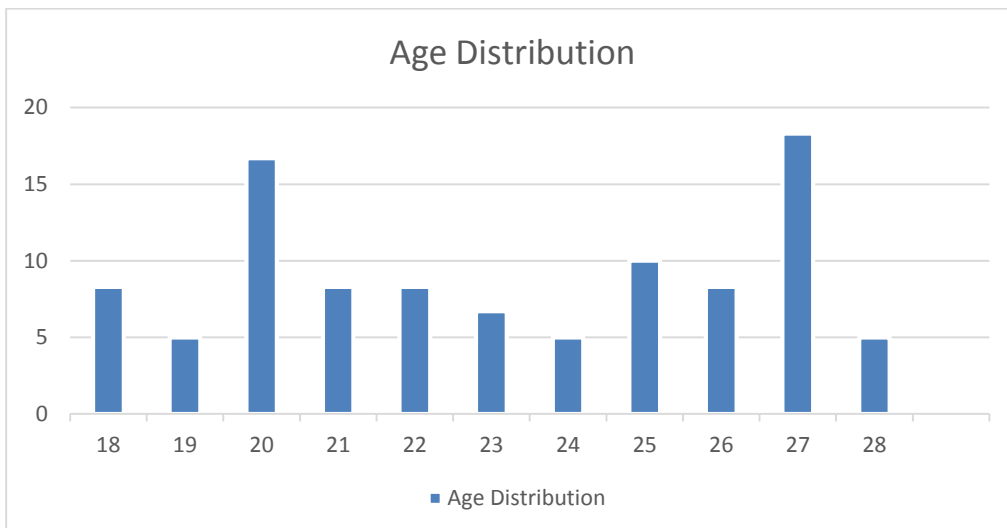


Fig 1A: Age distribution graph (Age in years on X-axis, Percentage on Y-axis)

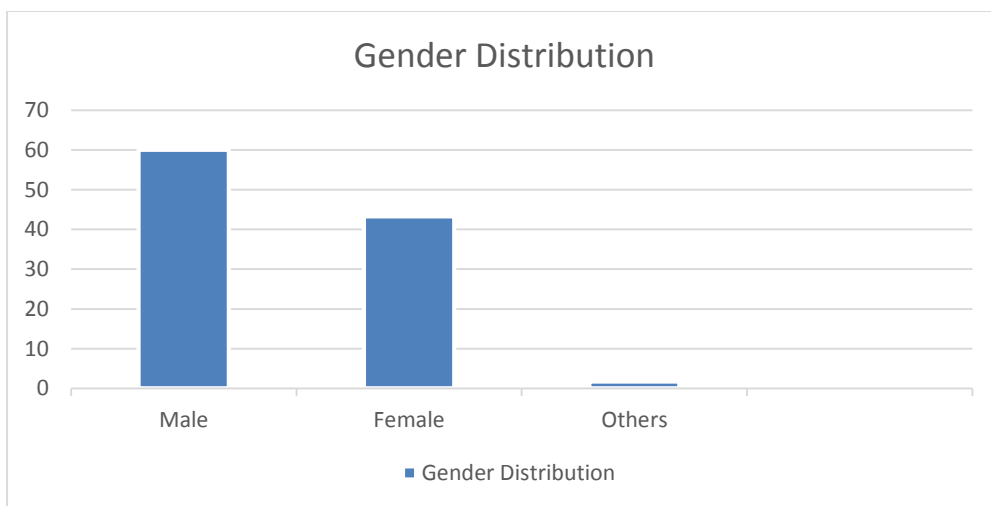


Fig 1B: Gender distribution graph (Gender in years on X-axis, Percentage on Y-axis)

History of using spectacles/contact lens

60 responses

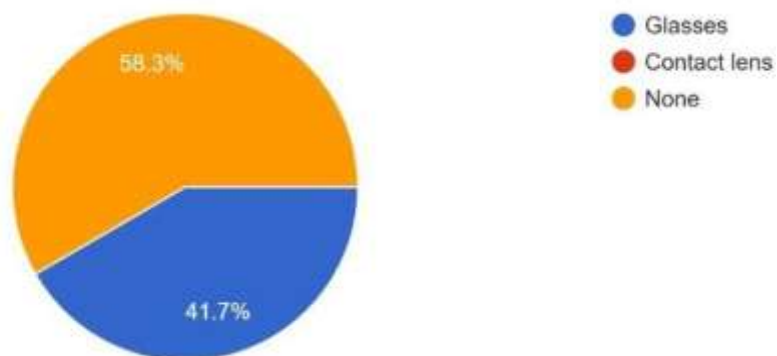


Fig 1D: Shows the screen interaction on various digital gadgets.

Medium of screen interaction

60 responses

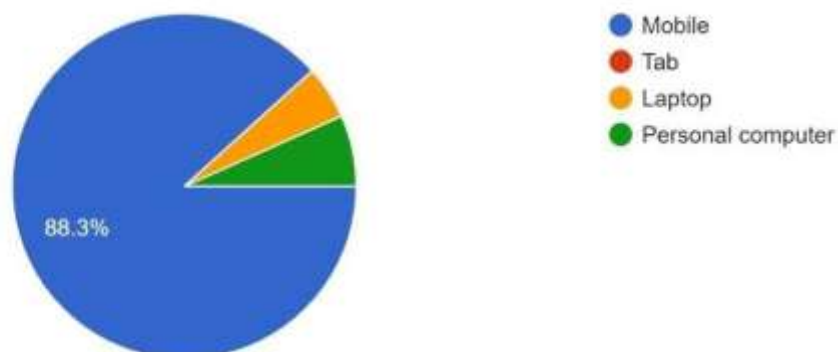
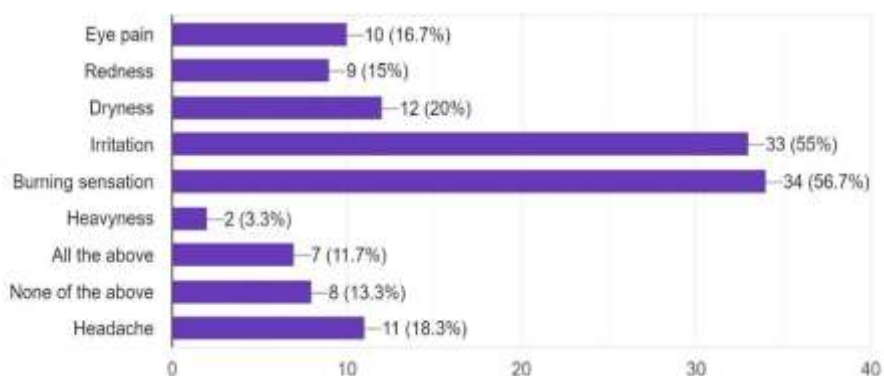


Fig 1E: Shows the responses of subject's symptoms while/after using digital gadgets

Have you ever experienced any of the following symptoms while using/after using the digital screen?

60 responses



Are you aware about how to get relief from dryness & related symptoms mentioned above? If yes then what

60 responses

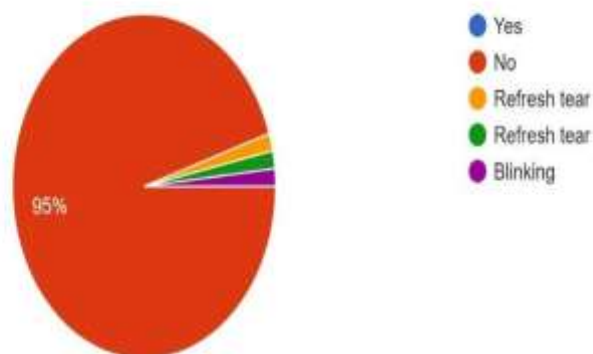


Fig 1F: Shows the various coping mechanism to get relief from dry eye related symptoms.

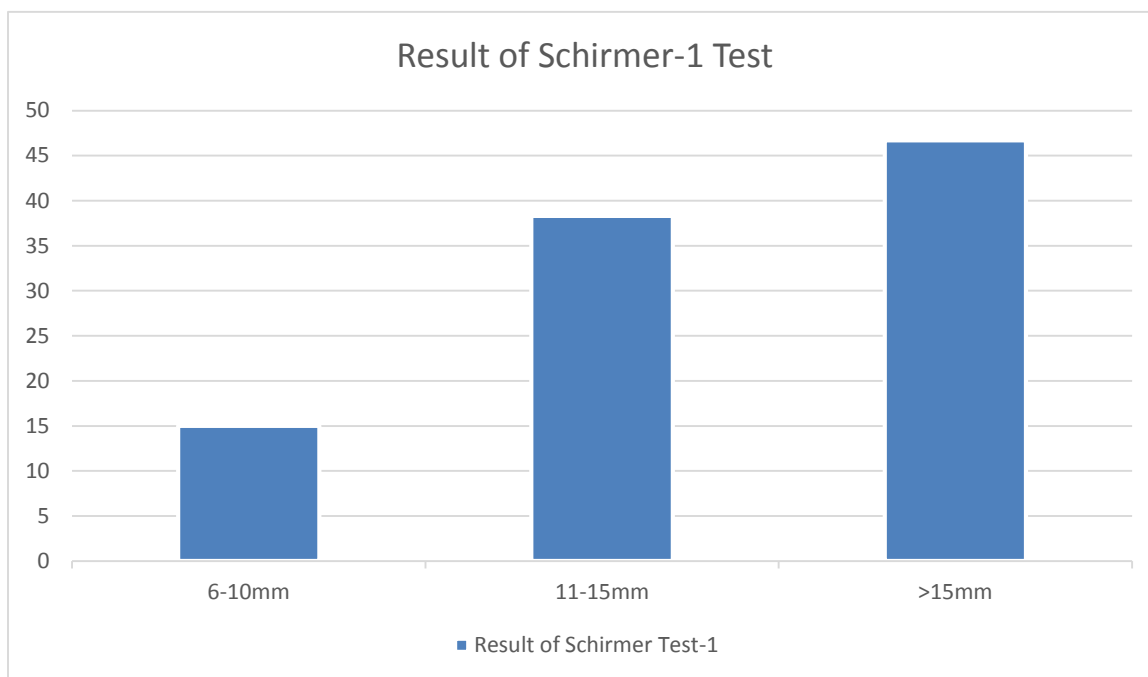


Fig 1G: Result of Schirmer-1 test (Wetting in millimetres on X-axis, and percentage on Y-axis)

4. Discussion

The discussion of the present study was based on the results achieved after the analysis of collected data. It is described in the view of the objectives of the current study. A supported study conducted by Rosalina Loebis et al, shows that 11.7 % students were having dry eye with mild exposure and 19.1% were having dry eyes with moderate exposure. In our study, 20% student were having dry eyes. It shows a positive correlation and suggests our subjects have also experienced the similar symptoms associated with dry eye. Most of the previous studies conducted and our study shows similar interest, which depicted that the usage of smart phone and digital gadgets has been significantly increased in teenagers, which can also lead to ocular discomfort. A study carried out by Sukanya Jaiswal et al, also shows that smart phone used by Australian teenagers increased by from less than 25 % to 80 % and in mine is 88.3% also ocular surface discomfort includes sore eyes, dryness, stinging, burning, itchiness and irritation the same symptoms are shown in my case also. Dry eye is caused by insufficient tear volume or function, which results in an unstable tear film and ocular surface disease. The tear film is mechanically spread throughout the ocular surface by a neuronally controlled blinking mechanism. When using a digital screen, the blink rate is reduced and the eyes may become dry as a result. The most common ocular symptoms include a feeling of dryness, grittiness and burning which typically intensify over the day. When exposed to situation associated with higher evaporation or prolonged reading or video display unit use when blink frequency is reduced, the symptoms of KCS are commonly aggravated. A relevant evaluation of aqueous tear production is the Schirmer-I test, entails determining how much a blotting paper 5mm wide 35mm broad has been wet in 5 minutes. The present study aimed to investigate the relationship between the dryness of the eyes and extensive usage of digital gadgets in young adults. The findings revealed a significant association between the two variables, suggesting that prolonged digital device use may contribute to the development of dry eye syndrome (DES) in this population. This discussion section will interpret the results in the context of previous literature, highlight the potential underlying mechanisms, and discuss the implications of these findings for both clinical practice and public health. The observed link between the dryness of the eyes and extensive usage of digital gadgets aligns with a growing body of evidence that supports the notion of digital eye strain as a consequence of prolonged screen time. The increasing prevalence of DES among young

adults can be attributed to the ubiquity of digital devices in their daily lives, ranging from smartphones to tablets and computers. These gadgets often require individuals to maintain prolonged periods of near work and visual concentration, leading to reduced blink rates and subsequent ocular surface desiccation. The present study's findings add to the mounting evidence supporting the detrimental effects of digital device use on ocular health.

The underlying mechanisms contributing to the development of DES in young adults who extensively use digital gadgets are likely multifactorial. Reduced blink rates during device use may lead to inadequate tear film distribution and evaporation, resulting in tear instability and ocular surface damage. The findings of a study conducted by Zaina Al-Mohtaseb et al, reveal that prolonged device use often occurs in environments with poor indoor air quality, such as air-conditioned rooms or spaces with low humidity, further exacerbating ocular dryness. Additionally, blue light emitted by digital screens has been suggested to disrupt circadian rhythm and impact the meibomian gland function, leading to reduced tear film quality and increased evaporation. Further research is needed to elucidate the specific mechanisms involved in the development of DES in this population. The implications of these findings are noteworthy for both clinical practice and public health. Clinicians should be aware of the potential ocular health risks associated with excessive digital device use in young adults. Routine eye examinations and patient education regarding proper visual hygiene and ergonomics during device use should be integrated into clinical practice. This may include recommendations to take frequent breaks, use artificial tear lubricants, and adjust environmental conditions to promote ocular comfort. From a public health perspective, these findings highlight the need for awareness campaigns and educational initiatives targeting young adults, parents, educators, and employers. Public health interventions could focus on promoting responsible digital device usage, raising awareness about the potential ocular health consequences, and encouraging the implementation of strategies to minimize eye strain. These may include developing guidelines for screen time, advocating for adequate lighting and ergonomics in work and educational environments, and incorporating ocular health education into school curricula. Limitations of the current study should be acknowledged. Firstly, the cross-sectional design prevents establishing causality and understanding the temporal relationship between digital device use and the development of DES. Longitudinal studies are warranted to explore the

causative role of prolonged screen time in ocular dryness. Secondly, the study relied on self-report measures for both digital device use and ocular symptoms, which may introduce recall bias. Objective measurements, such as tear film break-up time or ocular surface assessments, should be considered in future research. In conclusion, this study provides evidence supporting the association between the dryness of the eyes and extensive usage of digital gadgets in young adults. Prolonged screen time appears to be a significant risk factor for the development of DES in this population. The findings underscore the importance of promoting responsible digital device use, implementing preventive measures, and raising awareness among young adults, healthcare professionals, and the general public. Future research should focus on elucidating the underlying mechanisms and conducting longitudinal studies to establish causality in this relationship.

5. Conclusion

Excessive use of a digital screen causes dryness-related symptoms in the eyes of students, particularly those who are unaware of how to control dryness-related symptoms. Only three out of sixty students and their parents are aware of dryness precautions. We can control dryness and related symptoms with a few simple preventive measures. As we can see, people, particularly students, do not have a lot of knowledge about how to prevent dryness in the eyes, so we need to teach them about dry eyes and how to prevent dryness in the eyes through various mediums.

Summary

Due to the COVID-19 epidemic, it is now usual for every student to use digital gadgets and according to the developing world, dependency on digital gadgets is expanding day by day. However, along with the benefits, it may also bring ocular disorders such as eyestrain, dry eye, and more. There are certain preventive ways to deal with dryness and related symptoms, but the majority of students and their parents are unaware of how to manage dryness. For this reason, optometrists must inform students and their family about dry eye symptoms and how to avoid them.

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Declaration

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Ethical approval: Ethical approval was done by the ethical committee of ITM University, Gwalior, Madhya Pradesh, India

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