Section: Physiology & Pharmacology

Original Research Article

KNOWLEDGE, AWARENESS AND PRACTICE TOWARDS COMPUTER VISION SYNDROME AMONG MEDICAL STUDENTS

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Abstract

Background: Currently, using a computer and digital electronic devices is a part of daily life. A significant percentage of the workforce makes use of computers for their work. Over 60 million people worldwide are thought to have eyesight issues as a result of digital device use. Computer vision syndrome is "a complex of eye and vision problems associated with activities that stress near vision and are encountered in relation to or during computer use. **Materials and Methods:** The study was conducted through an online survey among medical students. The Questionnaire was designed to assess the knowledge, awareness and practice about computer vision syndrome among medical students. The questionnaire consisted of three parts which included participants' profile, around 20 questions to study the awareness and practice on computer vision syndrome. Statistical analysis of the data was done using SPSS software. The results or observations were recorded in the form of pie charts. Chi square test was done to assess the correlation between gender and awareness among medical students. **Result:** The study showed that only 44.7% of the medical students were aware of computer vision syndrome caused by screen time over usage. Most of the students (60%) use several devices like smartphones as well as laptops. Many students revealed the use of gadgets for more than 4 hrs. It was found that female medical students (37%) had better awareness compared to male students (24%). **Conclusion:** The study showed that only 44.7% of the medical students were aware of computer vision syndrome caused by screen time over usage.

INTRODUCTION

Currently, using a computer and digital electronic devices is a part of daily life. A significant percentage of the workforce makes use of computers for their work. Over 60 million people worldwide are thought to have eyesight issues as a result of digital device use. [1]

Computers and digital electronic devices are universally used in modern society for email, internet access, entertainment and social media. Blogs, micro-blogs, wikis, social networking sites, photo-sharing sites, instant messaging, video-sharing sites, podcasts, widgets, virtual worlds, and other forms of social media exist. A recent estimate indicates that in 2022, 66% of the world's population, or 5.3 billion people, were active Global internet users.[2] Accordingly, the number of internet users grows at a 4% annual rate, implying that approximately 196 million new people use the web each year. Some screen displays may require very tiny text, which necessitates shorter and closer viewing distance by the observer than was previously used for printed materials.

With the COVID - 19 pandemic, e-learning has become a mandatory method for present teaching and learning in schools and colleges. Scientific evidence revealed that the increased screen time has been linked to a variety of health issues, including eye diseases. About 88% of people, who use digital networks every day, undergo eye strain. These increased needs of visual activity may lead to a number of visual symptoms known as computer vision syndrome (CVS).[3] (Sasikala R Umesh, 2021).

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The numerous advantages of these devices usage cannot be denied, but they can also pose a number of health risks if used incorrectly. Visual and musculoskeletal issues are among the health risks. Prolonged use of these devices can result in a variety of visual symptoms known as Computer Vision Syndrome (CVS).[4] According to the American Optometric Association, Computer vision syndrome is "a complex of eye and vision problems associated with activities that stress near vision and are encountered in relation to or during computer use.[5] The symptoms of computer vision syndrome include tired eyes, redness, irritation, dry eyes, eye strain, temporary blurred vision, and sensitivity to light stimuli. The symptoms also include ocular surface abnormalities or accommodative spasms, as well as extra-ocular (ergonomic) aetiologies caused by poor posture, such as neck and upper back pain and headache. [1]

Digital devices can emit blue light, which is harmful for eyes and can lead to macular degeneration. [6] Although employing this type of device became indispensable, following a correct way to use digital devices can prevent CVS and hence awareness about CVS has become vital for every individual to avoid the occurrence of CVS. It is also equally mandatory to understand the symptoms of CVS and how to mitigate their impact on the individual. [7-9] The purpose of the study is to assess knowledge, awareness and practice about computer vision syndrome among medical students. The study can help to raise awareness about CVS and its corrective measures among college students.

MATERIALS AND METHODS

The study was conducted through an online survey among medical students. The advantages of online surveys is that it is time saving and involves only a selective group of people. Around 137 medical students participated in the survey conducted in the month of January - Feb 2023. The Simple-random sampling method was used. The Questionnaire was designed to assess the knowledge, awareness and practice about computer vision syndrome among medical students. The questionnaire consisted of three parts which included participants' profile, around 20 questions to study the awareness and practice on computer vision syndrome. The validity checking of the questionnaire was done by field experts. The data collection was done using Google forms and data manipulation, through Microsoft excel. Statistical analysis of the data was done using SPSS software. The results or observations were recorded in the form of tables [Table 1], pie charts and bar graph. The independent variables include age and education, whereas the dependent variable comprises awareness among medical students and knowledge. The correlation analysis was done through Chi square test, with the help of SPSS software, and was represented in the form of bar charts.

RESULTS AND DISCUSSION

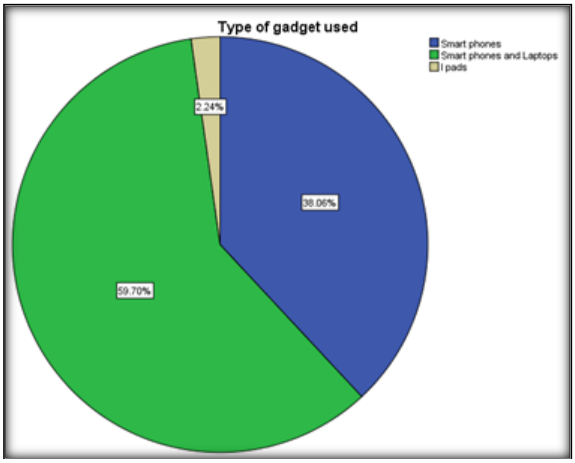

Figure 1: The pie chart represents the distribution of the usage of different types of gadgets. Blue denotes smart phones, green – smart phones and laptops and sandal represents Ipads. Majority (60%) of the medical students are using both smart phones and laptops

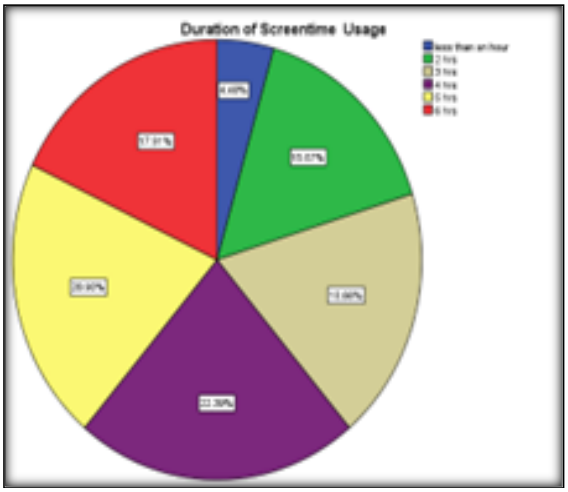

Figure 2: The pie chart represents the distribution of the symptoms experienced on using gadgets. Majority (22%) of the students use gadgets for 4hrs

Table 1: Table represents the responses of the participants to the following questions.

S.no.	Questions	Yes (%)	No (%)
1	Type of gadgets used	Smart phones - 38% Smart & Laptops – 59.7% I pads – 2.24%	
2	Duration of Screen Time usage	Less than an hr – 4.48% 2hrs- 15.6% 3hrs- 18.7% 4hrs-22.39%	

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		5 hrs-20% More than 6 hrs – 17.9	
3	Are you experiencing any of the following symptoms while using gadgets	Headache-33.5% Tiredness-26.1% Blurred vision- 8.9% Dry or watery eyes-15.6% Redness – 7.4% Double vision-2.2% Pain around eyes-5.97%	
4	Are you wearing glasses for refractive errors	53%	47%
5	Do you blink eyes more than usual	10.45%	89.5%
6	Do you have sleep disturbances due to usage of Gadgets	28.3%	71.6%
7	Do you have mood swings due to long screen time usage	21.6%	78.4%
8	Do you have sensitivity to bright lights	47.7%	52.2%
9	Are you aware that light coming out of gadgets affect the eyes	94.7%	5.2%
10	Are you aware that adjusting the brightness and contrast of a gadget is useful	96.2%	3.3%
11	Are you aware that there are eye glasses available to protect the eyes while using gadgets	91%	9%
12	Are you aware that taking a breaks between gadgets use would protect your eyes	96%	4%
13	Are you aware that seating position would affect your eyes while using Gadgets	95.5%	4.5%
14	Are you aware of 20-20-20 rule (Every 20 minutes, look at an object 20 feet away for 20 seconds)	62.6%	37.3%
15	Are you aware that overuse of screen time can cause computer vision syndrome	44.7%	55.2%
16	Do you use eye protection glasses while using digital devices	56%	44%
17	Do you maintain distance of 20-24 inches while using devices	38%	62%
18	Do you maintain the Gadgets at the eye level	49%	51%
19	Did you seek medical advice for eye strain on using Gadgets	29%	70%
20	Are you using Anti-glare screen on your digital devices	36%	64%

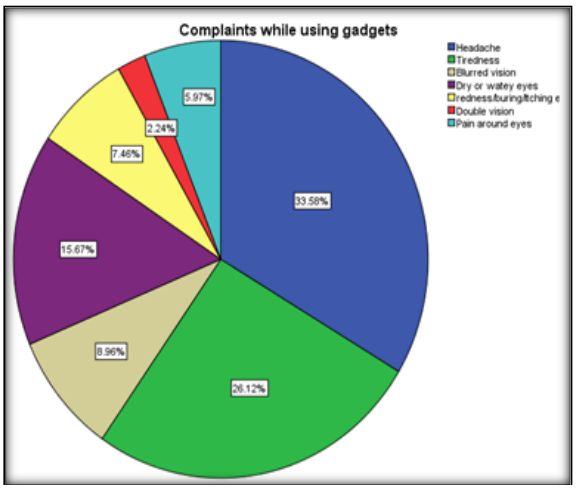

Figure 3: The pie chart represents the distribution of the symptoms experienced on using gadgets. Majority (22%) of the students suffer from Headache

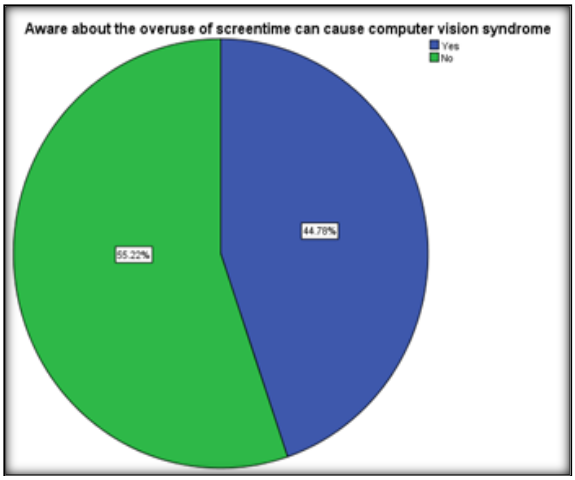

Figure 4: The pie chart represents the distribution of the awareness that overuse of screen time could cause computer vision syndrome (CVS). Majority (55%) of the students were not aware of CVS

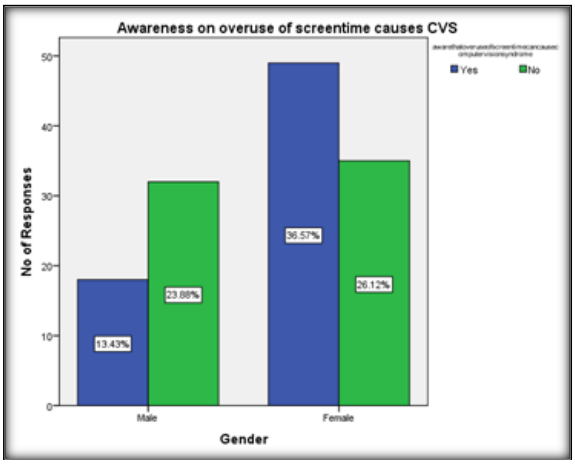

Figure 5: The graph depicts the association between gender and awareness of the CVS on overuse of screen time. X axis - Gender, Y - axis - Number of responses. Female students (37%) were more aware than the male students. Chi-square test - p - 0.01 ($p < 0.05$) and it is statistically significant.

The present study revealed the type of digital device usage of smartphones is 38.06%, Ipad/tabs are 2.24% and both smartphone and laptop is 59.7% [Figure 1]. Among the participants, usage of the smart phones with laptops was more frequent and it was their preferred type of digital device. Similarly, a study conducted in the year 2019 among school children shows preferred devices were smartphones and laptops more than the other gadgets.[10] The

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duration of screen time more than 3,4,5,6 hours is 18.66%, 22.39%, 20.90% and 17.91% respectively [Figure 2]. Majority of medical students used digital screens for 3 hours or more per day and approximately half of respondents spent more than 4 hours using digital devices daily.[11,12] This study shows participants have more complaints of headache 33.58%, tiredness, dry eyes, blurred vision 26.12%, 15.67% and 8.96 % respectively. Redness, burning and itching is 7.46%, double vision 2.24% and Pain around the eyes 5.9% [Figure 3]. The symptoms experienced in computer vision syndrome are caused due to the improper placement of computer screen, prolonged and extended duration of computer usage results in the disturbance in homeostatic mechanism they are, extra ocular mechanism causes musculoskeletal symptoms such as headache. Accommodative mechanism causes blurring of vision, double vision.[12] Ocular surface mechanism causes symptoms such as dryness of the eyes, redness, and burning after extended period of computer usage.[13,14] The current study shows around 89.55% frequent blinking of eyes is absent while using gadgets, this may be multifactorial, among the common factors found to be related to reduction in blink rate, caused by horizontal gaze at the computer screen.[15]

Another significant finding in the current study was sleep disturbance due to usage of gadget is more in females 41.79%, when compared to male participants 29.85%. This is similar to results from other studies on impact of excessive digital device use on sleep quality in college students, which established CVS is strongly associated with poor sleep quality.[16,17] Light-emitting diodes in electronic devices is the most common source of light. Therefore, light emitted from gadgets screens can interact with the circadian rhythm disturbance resulting in inhibition of melatonin, which is also known as sleep hormone.[18] Hormonal changes can wreak havoc on sleep. In turn, sleep deprivation can affect hormone levels in a sleepless vicious cycle. This study throws light on mood swing due to long screen time usage, shows 15.67% in females and 5.97% in male. Studies established people who are sleep deprived reported more negative moods like anger, anxiety and depression. [19]

Concerning the CVS awareness questionnaires, the present study findings revealed; a statistically significant awareness existing in all measures like 62.69% of students have knowledge about the 20-20-20 rule. The study showed that only 44.7% of the medical students were aware of computer vision syndrome caused by screen time over usage [Figure 4]. It was found that female medical students (37%) had better awareness compared to male students (24%) [Figure 5]. And 91.04% of students are aware about usage of protective eye glasses. 94.7% are aware that light coming out of gadgets affects the eyes and 96.27% of the study population is aware that adjusting the brightness and contrast of a gadget is useful. 95.5% aware that seating position would affect your eyes while using gadgets. This result could highlight the significant effect of the awareness strategy which aimed to promote healthy practices. This result could highlight the significant effect of the awareness strategy which aimed to promote the healthy practices among medical students. But less than 50% of study participants are unaware that overuse of screen time, maintain distance of 20-24 inches while using devices, maintain the Gadgets at the eye level, and not use an Anti-glare screen can cause computer vision syndrome. 70% not aware that they should seek medical advice for eye strain on using Gadgets. In accordance with Sanodiya et al., (2019) in the study entitled “A cross sectional overview of Digital Eye Strain: a growing health concern in this digital age in central India” which revealed that; more than half of the participants did not apply preventive measures to avoid DES as using digital screen filters, keeping appropriate distance of viewing digital screen nor following the 20-20-20 rule also never took breaks in between screen time use.[20]

CONCLUSION

The study showed that only 44.7% of the medical students were aware of computer vision syndrome caused by screen time over usage. Most of the students (60%) use several devices like smartphones as well as laptops and these create a range of visual demands in terms of text size, angle of gaze, working distances and so on that differ significantly from those of printed materials. Also most of the students experienced symptoms like headache, dry eyes, tiredness, blurred vision, redness, burning etc. It was found that female medical students (37%) had better awareness compared to male students (24%). Because computer use has become ubiquitous in higher education institutions, there is a need to educate people about limiting overall screen exposure and postural comforts of screen viewing. Hence the primary management strategy for computer vision syndrome is prevention.

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