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A STUDY OF COMPUTER VISION SYNDROME IN MEDICAL STUDENTS

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ABSTRACT

Background: With increasing use of computers and digital screens in the present age by young adults in educational institutions, it is a need to study the visual problems and the association of current practices and related ocular discomforts in undergraduate medical students.

Method: A descriptive cross-sectional study was done, which included 100 medical undergraduate students, amongst them 50 were males and 50 were female students. Study was done using a well structured questionnaire for computer vision syndrome survey. The questionnaire included 20 questions, which were of high reliability and validity. The 100 answered questionnaires were studied thoroughly and the results were obtained.

Results: Out of the 100 medical undergraduate students studied, 12 had less than 3 hrs digital screen usage and were asymptomatic and the other 88 had history of more than 3hrs digital screen usage, out of which 10 had no symptoms and the other 78(88.64%) students had computer vision syndrome and presented with the symptoms like, dry eye which was seen in 28 students (35.9%), eye strain was seen in 19 students (24.4%), blurred vision was seen in 32 students (41%), headache was seen in 12 students (15.4%), redness of the eyes was seen in 9 students (11.5%), neck and shoulder pain was seen in 11 students (14.1%).

Conclusions: This cross-sectional study confirms that computer vision syndrome is a common syndrome in medical student population. This study recorded that blurred vision, dry eye and asthenopia as most common symptoms of computer vision syndrome. Based on this study 88.64% of medical students were complaining of one or more symptoms of computer vision syndrome who had the exposure to digital screen for 3 or more hours in a day.

KEYWORDS : Computer vision syndrome (CVS), Smart phones, Digital screens, Eye strain, Dry eye disease

INTRODUCTION:

Modern life style has compelled the students to use the digital screens and computers for prolonged hours to study their subjects in place of the text book studies hence there is an increase in the use of computers and digital screens in the present age by students, along with playing games and watching movies on mobiles which has added to the increased screen time. With increasing use of computers and digital screens in the present age by young adults in educational institutions, it is a need to study the visual problems and the association of current practices and related ocular discomforts in undergraduate medical students.

Computer Vision Syndrome (CVS), according to the American Optometric Association (AOA), is a complex of eye and vision problems which result from the activities those stress the near vision while using the computers and digital screens. Vision affection results from interaction with digital screens, computer display or their environment. [1]

Computer Vision Syndrome which is also known as Digital Eye Strain (DES) has dry eyes sensation, eyestrain, blurred vision, burning of eyes, watering of eyes, photo phobia, red eyes, headache, neck and shoulder pain as the symptoms.[2]

The daily use of personal computers and digital screens for 3 hours or more puts the person at high risk of developing CVS, headache, Occupational Overuse Syndrome (OOS) and psychosocial stress. The severity of CVS manifestation depends on the time spent on the digital screens. People who are accustomed to spend 3 hours or more regularly on a daily basis are mostly complaining of CVS. [3]

A study conducted likewise recorded that 86% of the medical students used to spend 3 hours or more on a daily basis thus were complaining of one or more of CVS manifestations.[4]

Multiple factors like prolonged digital screen usage, infrequent blinking, improper lighting conditions could be responsible for the development of CVS. Mechanism like extra ocular mechanism, accommodative mechanism and ocular surface mechanism can be the possible pathophysiology for CVS. [1]

The Blue light emitted by digital devices has also been implicated as a cause of digital eye strain.[5]

The aim of this study was to determine the prevalence of CVS among undergraduate medical students, associated risk factors, most commonly associated symptoms. CVS has a negative influence on the life style and studies hence many authors have recommended interrupted screen usage and to have at least 15-20 minutes break every 2 hours of continuous digital screen usage. Education regarding CVS, proper room lighting and adequate adjustment of the distance between the eye and the digital screens can guard against CVS.

METHODS

This study was conducted to survey the prevalence of CVS among 100 undergraduate medical students. It is a descriptive cross sectional study. The ethical committee approval was taken for the study. The CVS questionnaire form was explicitly explained to the students and was asked to be filled accordingly. The questionnaire consisted of the following; Gender, Type of digital screen usage, Hours of digital screen usage, Hours of digital screen usage in dark room, Pattern of digital screen usage, Level of digital screen illumination, Most of the screen time spent, Symptoms, History of dry eye disease, Usage of lubricants for dry eye disease, Presence of refractive error, Are you wearing glasses?, Symptoms after prolonged smart phone usage, How many years did you spend like this on the screen?, I'm frequently using, Studying medicine is with, Do you feel digital screen usage affects eye health?, Are you willing to decrease screen hours ?

The answers for the questionnaire was collected and compiled in Microsoft excel sheet and the results were noted. The excel sheet data was used for the statistical analysis to obtain the results. The qualitative data obtained was presented as numbers and percentages.

RESULTS

100 medical undergraduate students were included in the study. The structured questionnaire included 18 questions which allowed the

students to choose more than one option for the same question hence there is presence of different percentages for the same question.

Out of 100 students 50 were males and 50 females, which constituted the first question. 86% had android mobile usage and 54% had laptop usage history. Hours of digital screen usage was 12% for less than 3hours duration and 90% had more than 3 hours of screen usage. Whereas digital screen usage in dark room was found to be 10% for less than 3 hours and 90% were of more than 3 hours usage history.

Pattern of digital screen usage was seen to be continuous in 26% and interrupted in 74% of students. For the question of digital screen illumination 23% used less than 35% illumination, 67% students used 35%-70% illumination, 10% used 75%-100% illumination. Most of the screen time spent was noted to be 48% were daytime users and 52% were night.

The symptoms of CVS as noticed by the students were Blurred vision in 41%, Eye strain in 24.4%, Headache in 15.4%, Dry eye in 35.9%, Eye redness and irritation in 11.5% and shoulder/neck pain in 14.1%. Whereas 22 students had no symptoms of CVS.

24% had history of previously diagnosed dry eye disease and 76 had no history of previously diagnosed dry eye disease.11% had history of usage of lubricants for dry eye disease and 89% had no history of lubricant usage. 37% had refractive error and 63% had associated refractive error. 34% were using spectacles and 66% had no spectacle usage history.

For symptoms after prolonged smart phone usage, 11% had shoulder pain, 80% had finger and wrist pain and 10% had no symptoms.

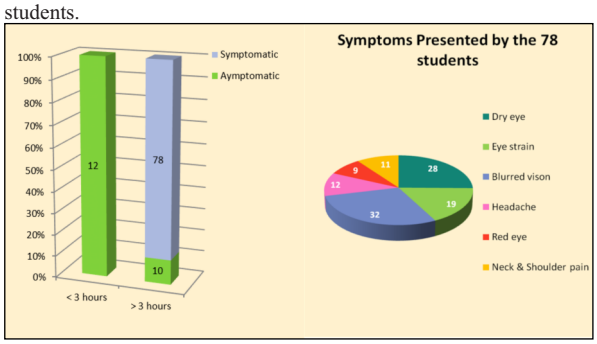
21% of students have history of such prolonged digital screen usage for 1year, 42% since 2years and 37% since 3years. Mode of usage was; 94% had touch screen usage, 25% had mouse and keyboard usage.

8% of the students use only digital screen for their studies, 12% use books for the studies and 80% use both books and digital screen for the studies.

92% students acknowledge that digital screen usage affects eye health whereas 8% say that digital screen has no effect on eye health.

84% of the students are willing to reduce the screen usage time and the other 165 are not willing for the reduction of screen usage time.

So out of 100 students, 12 had less than 3 hours digital screen usage history & were asymptomatic, other 88 had history of more than 3 hours of digital screen usage. Of the 88, 10 had no symptoms & 78 (88.6%) had CVS & presented with, dry eye in 28 students (35.9%), eye strain in 19(24.4%), blurred vision in 32(41%), headache in 12(15.4%), red eye in 9(11.5%), neck & shoulder pain in 11(14.1%) students.



Computer Vision Syndrome Survey Performa

1	Gender	Male
		Female
2	Type of digital screen usage	Android mobile
		Laptop
3	Hours of digital screen usage	< 3hrs
		> 3hrs
4	Hours of digital screen usage in dark room	< 3hrs
		> 3hrs
5	Pattern of digital screen usage	Continuous
		Interrupted
6	Level of digital screen illumination	< 35%
		35% - 70%
		75% - 100%
7	Most of the screen time spent	Day
		Night
8	Symptoms	Blurred vision
		Eye strain
		Headache
		Dry eye
		Eye redness & irritation
		Shoulder/ neck pain
		No symptoms
9	History of dry eye disease	Yes
		No
10	Usage of lubricants for dry eye disease	Yes
		No
11	Presence of refractive error	Yes
		No
12	Are you wearing glasses?	Yes
		No
13	Symptoms after prolonged smart phone usage	Shoulder pain
		Finger & wrist pain
		None
14	How many years did you spend like this on the screen?	1yr
		2yr
		3yr
15	I'm frequently using	Touch screen
		Mouse & keyboard
16	Studying medicine is with	Screens
		Books
		Both
17	Do you feel digital screen usage affects eye health?	Yes
		No
18	Are you willing to decrease screen hours?	Yes
		No

DISCUSSION

Development of technology and modern lifestyle has compelled the use of digital screens, among which smart phones are more popular and very commonly available with all. More time is being spent on watching audio-visuals on smart phones and this has also caused change in lifestyle. Time spent with family and friends has been shifted to increased screen time. Online classes for academic teaching have increased digital screen usage time.

According to the American Optometric Association, Computer Vision Syndrome (CVS) or Digital Eye Strain (DES) is defined as a collection of ocular and extra ocular manifestations resulting from using the digital screens for prolonged hours. Eye strain, dry eye, redness and irritation, headache, neck pain and shoulder pain are the commonly complained symptoms of CVS. However the severity of these symptoms depend upon the hours of digital screen usage, which is seen to be more in people using screen for 3 hours or more daily on a regular basis.

This study was done to know about the prevalence of CVS among medical students. A total number of hundred medical undergraduate students were selected on a random selection basis and were asked to fill a questionnaire about their digital screen usage and the symptoms they had.

Out of 100 students involved in the study 88 students had history of digital screen time usage of more than 3 hours, of which 88.6% had Computer Vision Syndrome. Their symptoms included dry eye in 28 students, eye strain in 19 and blurred vision in 32 students, which were of majority amongst the other symptoms of computer vision syndrome. 80% of the students had history of digital screen usage especially smart phones for the academic studies along with their books. The study shows the association of CVS in medical students with increased digital screen usage for continued hours on a regular

basis. A majority of 92 students are aware of the association of CVS with prolonged digital screen usage but only 84 of them were willing to reduce the screen usage time.

A study done by Mohammed Iqbal et al., showed that 86% of the medical students were using digital screens for 3 hours or more daily which made them liable for CVS.[4]

Based on a study by Patil A et al, about 34.1% of the medical students were aware of CVS and 65.9% were not aware of CVS.[6]

CONCLUSION

The study concluded that Computer Vision Syndrome was very common but most of the times misdiagnosed. Blurred vision, dry eye and eye strain were the common symptoms seen in the medical students with CVS, which was associated with prolonged hours of digital screen usage.

Ethical Approval:

Obtained from the Institutional Ethics Committee, MVJ Medical College and Research Hospital, Bangalore.

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Conflict Of Interest

The authors does not declare any competing conflict of interest.

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