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How Common is the Computer Vision Syndrome among College Students

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Abstract: ***This study was done to estimate how common the computer vision syndrome among college students is. A cross sectional study was conducted among the college students studying courses in Chennai. The inclusion criterion was all the students who were using computer for more than a month before the study was started. A questionnaire with 13 questions was prepared. It was given to the students who participated in the study by the author. A total of 200 college students were included in the study based on the inclusion criteria out of which 168 (84%) were UG students, 13 (6.5%) were PG students, 11 (5.5%) were Diploma students and 8 (4%) were PHD students.83 students (41.5%) were aware about Computer vision syndrome while 117 students(58.5%) were not aware of it. Various results of other questions were represented in the form of pie charts. The present study reveals that almost all the students are affected by any one symptoms of computer vision syndrome. Those students who use computer continuously for more hours were at a higher risk of developing Computer vision syndrome when compared to students who spend less hours and take frequent breaks.***

Keywords: Awareness, Computer, Digital, Devices, Syndrome, Vision

1. Introduction

The use of computers is universal. Globally personal computers were one of the most commonest office tools. This advanced technology plays an integral role in the professional, educational and personal lives in all companies, institutions and homes today[1, 2] Usage of digital devices like tablets, smartphones, iPads and laptops have become a necessity. Recent studies have shown that the most frequently occurring health problem among the users of these devices are computer vision syndrome[3,4,5,6]. Their usage for about 3 hours a day or more can lead to computer vision syndrome (CVS), low back pain, tension headaches and psychosocial stress[6]. Computer Vision Syndrome, also referred to as Digital Eye Strain, describes a group of eye and vision-related problems that result from prolonged computer, tablet, e-reader and cell phone use. Many individuals experience eye discomfort and vision problems when viewing digital screens for extended periods. The level of discomfort appears to increase with the amount of digital screen use.

CVS is defined as a complex of eye and vision problems which are closely associated with the use of computers[7]. The main ocular symptoms are eye strain, irritation, burning of eyes, reddening of eyes, severe headache, blurred vision and double vision[8].These symptoms can be caused by poor lighting glare on a digital screen improper viewing distances poor seating posture uncorrected vision problems and a combination of these factors. Prevalence of computer vision syndrome ranges from 64% to 90% among computer users[9].The extent to which individuals experience visual symptoms often depends on the level of their visual abilities and the amount of time spent looking at a digital screen. Uncorrected vision problems like farsightedness and astigmatism, inadequate eye focusing or eye coordination abilities, and ageing changes of the eyes, such as presbyopia, can all contribute to the development of visual symptoms when using a computer or digital screen device. Many of the visual symptoms experienced by users are only temporary and will decline after stopping computer work or use of the digital device. At some persons the blurred vision continues even after stopping work at a computer. They should be treated immediately. Many studies were done based on CVS due to sitting postures at workplace an various musculoskeletal discomforts. The extent to which individuals experience visual symptoms often depends on the level of their visual abilities and the amount of time spent looking at a digital screen. Uncorrected vision problems like farsightedness and astigmatism, inadequate eye focusing or eye coordination abilities, and aging changes of the eyes, such as presbyopia, can all contribute to the development of visual symptoms when using a computer or digital screen device.

Many of the visual symptoms experienced by users are only temporary and will decline after stopping computer work or use of the digital device. However, some individuals may experience continued reduced visual abilities, such as blurred distance vision, even after stopping work at a computer. If nothing is done to address the cause of the problem, the symptoms will continue to recur and perhaps worsen with future digital screen use.

Prevention or reduction of the vision problems associated with Computer Vision Syndrome or Digital Eye Strain involves taking steps to control lighting and glare on the device screen, establishing proper working distances and posture for screen viewing, and assuring that even minor vision problems are properly corrected.

Viewing a computer or digital screen often makes the eyes work harder. As a result, the unique characteristics and high visual demands of computer and digital screen device viewing make many individuals susceptible to the development of vision-related symptoms.

Children using digital devices Uncorrected vision problems can increase the severity of Computer Vision Syndrome or Digital Eye Strain symptoms.

Viewing a computer or digital screen is different than reading a printed page. Often the letters on the computer or handheld device are not as precise or sharply defined, the level of contrast of the letters to the background is reduced, and the presence of glare and reflections on the screen may make viewing difficult.

Viewing distances and angles used for this type of work are also often different from those commonly used for other reading or writing tasks. As a result, the eye focusing and eye movement requirements for digital screen viewing can place additional demands on the visual system.

In addition, the presence of even minor vision problems can often significantly affect comfort and performance at a computer or while using other digital screen devices. Uncorrected or under corrected vision problems can be major contributing factors to computer-related eyestrain.

Even people who have an eyeglass or contact lens prescription may find it's not suitable for the specific viewing distances of their computer screen. Some people tilt their heads at odd angles because their glasses aren't designed for looking at a computer. Or they bend toward the screen in order to see it clearly. Their postures can result in muscle spasms or pain in the neck, shoulder or back.

In most cases, symptoms of CVS or Digital Eye Strain occur because the visual demands of the task exceed the visual abilities of the individual to comfortably perform them. At greatest risk for developing CVS or Digital Eye Strain are those persons who spend two or more continuous hours at a computer or using a digital screen device every day.

Computer Vision Syndrome, or Digital Eye Strain, can be diagnosed through a comprehensive eye examination. Testing, with special emphasis on visual requirements at the computer or digital device working distance, may include:

Patient history to determine any symptoms the patient is experiencing and the presence of any general health problems, medications taken, or environmental factors that may be contributing to the symptoms related to computer use.

Visual acuity measurements to assess the extent to which vision may be affected.

A refraction to determine the appropriate lens power needed to compensate for any refractive errors (nearsightedness, farsightedness or astigmatism).

Testing how the eyes focus, move and work together. In order to obtain a clear, single image of what is being viewed, the eyes must effectively change focus, move and work in unison. This testing will look for problems that keep your eyes from focusing effectively or make it difficult to use both eyes together.

This testing may be done without the use of eye drops to determine how the eyes respond under normal seeing conditions. In some cases, such as when some of the eyes' focusing power may be hidden, eye drops may be used. They temporarily keep the eyes from changing focus while testing is done.

This study was done to assess how common is the Computer vision syndrome among the college students.

2. Materials and Methods

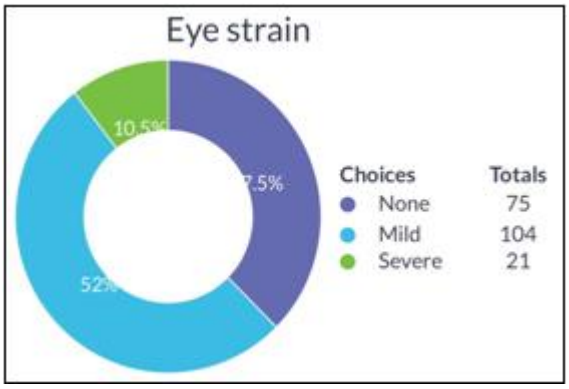
A cross sectional study was conducted among the college students studying courses in Chennai. The inclusion criterion was all the students who were using computer for more than a month before the study was started. A questionnaire with 13 questions was prepared. It was given to the students who participated in the study by the author. The subjects were asked to mark whether they had experienced none, mild or severe symptoms during or after using digital devices for a long time. The data was analysed using Microsoft Excel and the descriptive data was presented in the form of tables, pie charts and graphs.

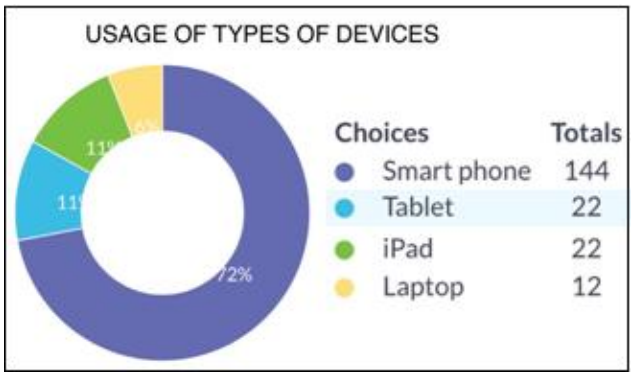
The questionnaire given to them is as follows:

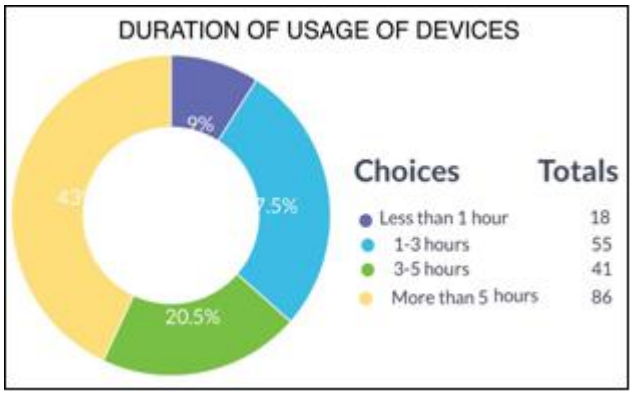
1. Educational course :
   - UG
   - PG
   - DIPLOMA
   - PHD
2. Are you aware of computer vision syndrome
   - Yes
   - No
3. What type of device do you use regularly ?
   - Ipad
   - Smart phone
   - Laptop
   - Tablet
4. How long will you use them daily ?
   - Less than one hour
   - 1-3 hours
   - 3-5 hours
   - More than five hours
5. Do you have any eye related problems ?
   - Yes
   - No
6. Do you wear spectacles?
   - Yes
   - No
7. If yes , have you you started using it after a long usage of these digital devices?
   - Yes
   - No
8. After using devices for a long time, Have you ever experienced any uncomfortable feeling in eye ?
   - Yes
   - No
9. Eye strain
   - None
   - Mild
   - Severe
10. Reddening of eyes
    - None
    - Mild
    - Severe
11. Have you experienced any of these conditions?
    - Headache
    - Shoulder pain
    - None
12. Have you experienced any of these conditions?
    - Blurred vision
    - Double vision
    - None
13. Have you experienced any of these conditions?
    - Burning sensation of eyes
    - Dry eyes
    - None

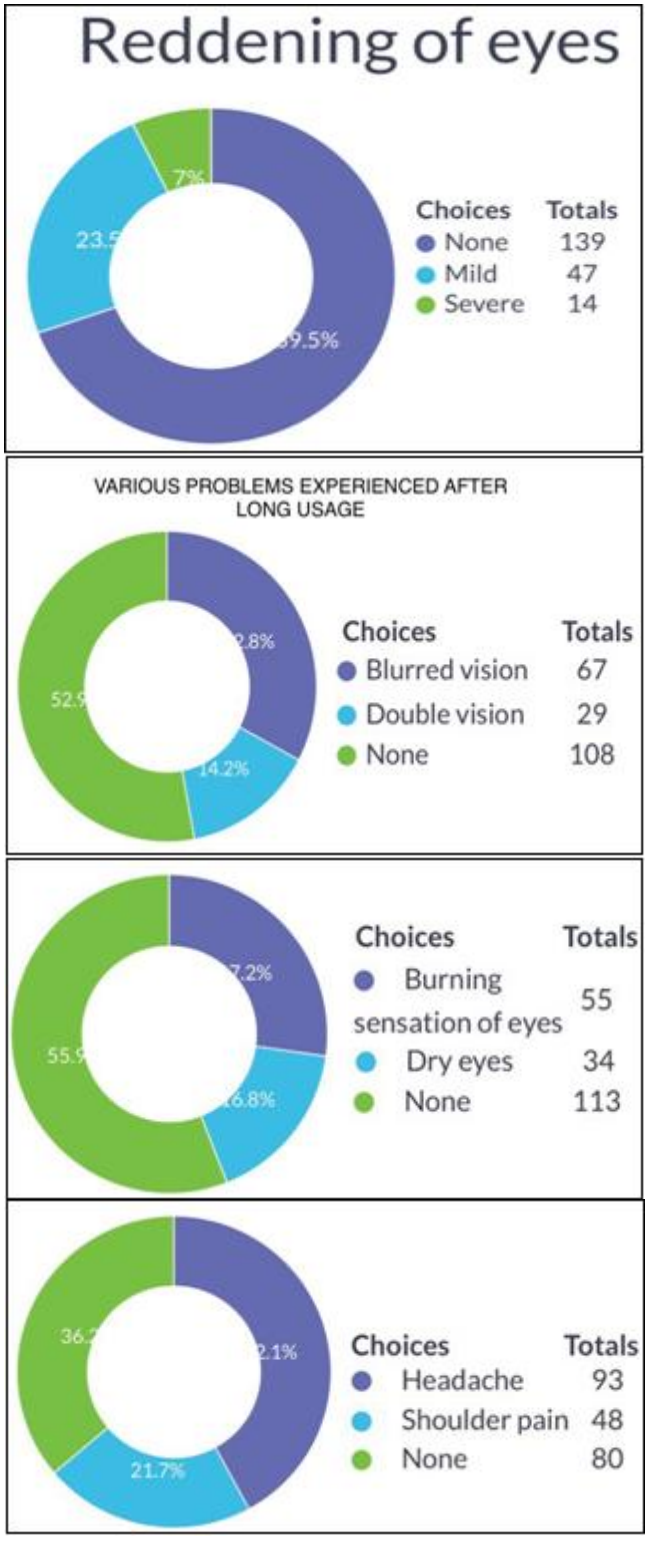
3. Results

A total of 200 college students were included in the study based on the inclusion criteria out of which 168 (84%) were UG students,13 (6.5%) were PG students, 11 (5.5%) were Diploma students and 8 (4%) were PHD students.83 students(41.5%) were aware about Computer vision syndrome while 117 students(58.5%) were not aware of it. Most number students used smartphones for their daily use while remaining people used Tablets, iPads and Laptops respectively. About 43% of the students used these devices for more than five hours a day. Other results are given in the form of pie charts.









4. Discussion

The present study was conducted among 200 college students in Chennai. 41% of students were already diagnosed with eye problems.80 students (40%) wore spectacles while 21.6% of those students started wearing spectacles after a long usage of these digital devices. Students who wore spectacles were very low when compared to other studies about 30.5% of students experience reddening of eyes after using the computer for a long time. In contrast, we see a high prevalence of 40.2% and 40.7% symptom of redness in the study by Shrisvastava and Bobhate, and Talwar et al[10,11].Eye strain level of students after using digital devices for a long time were not noted in many studies . In our study, this symptom was at a moderate level of 52% and a severe level of 10.5%.Prevalence of headache was seen in 42.1% of students which is comparatively higher than what was reported by Talwar et.al.[11] and by Kesavachandran et.al.[12] and higher than what was reported by Sen and Richardson among undergraduates[6]. Nearly 21.7% of the students reported shoulder pain. The symptoms of neck and shoulder pain were high as 62% in computer workers [13] .In contrast Diepenmaat et al., have reported a low prevalence of 11.5% among adolescents [14] .16.8% of students reported dry eyes. When a student is seated in front of a computer for a long time, the blinking may drop by 60%. The reduced blinking rates contribute poor tear secretion and temporarily stresses the cornea, resulting in dry eyes [15]. Uchino et al., observed symptoms of dry eyes in 10.1% of male and 21.5% of female Japanese officers [16]. Xu et al., Schaumberg et al., and Gayton have also observed higher prevalence in women than men [17,18,19] .27.2% of students complained of burning sensation in their eyes. Lower prevalence of 28.9% was reported by Talwar et al., while Sen and Richardson reported 55% among undergraduates [6,11] .Similar finding of 54.6% of prevalence of burning sensation was reported by Costa et al., among all call centre workers in Brazil [20] .Blurred vision was found more prevalent at a rate of 32.8% than the double vision(14.2%) among college students. There are various studies which supported the association of blurred vision with computer use [14,20,21] .In the present study, most of the students(43%) use digital devices for more than 5 hours a day so they have more risk of developing computer vision syndrome than students who use them for about 1 to 3 hours a day(27.5%). Many studies have proved that an increase in the number of hours spent on the computer increases the risk of computer vision syndrome significantly.

5. Conclusion

The present study reveals that almost all the students are affected by any one symptoms of computer vision syndrome. Those students who use computer continuously for more hours were at a higher risk of developing Computer vision syndrome when compared to students who spend fewer hours and take frequent breaks. Though Computer vision syndrome doesn't cause any permanent damage to eyes, it can cause temporary inefficiency and discomfort. Since majority of students are unaware of CVS it is very important to make them understand about the problems that can be caused due to a long usage of digital devices .It is also important to make them practice right methods like ideal viewing distance, sitting in a correct posture, using adjustable chairs, screen viewing at the same level and taking frequent breaks.

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