Original Article

EVALUATION OF PATTERN OF COMPUTER VISION SYNDROME DISORDERS IN YOUNG ADULTS – A CROSS-SECTIONAL STUDY

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ABSTRACT

The study was designed to evaluate the pattern of computer vision syndrome disorders in young adults. All patients (n= 138, 74 males and 64 females) coming with complains of dry eyes, eye strain, burning eyes, redness, blurring and headache were included. These patients were aged between 18 to 35 years with at least 2 hours' exposure to any type of Visual Display Terminal (VDT). The mean age of the study population was 20.4 years. The majority of the study subjects were males, i.e. 74 (53.6%). Around 78.2% of study populations had refractive errors. Myopia was the most significant refractive error found in 53.6% of the study population. The prevalence of CVS in our study group was 89.1%, with headache as the most common symptom reported in 68.8%. Furthermore, 94.9% of participants were viewing the screen from a distance of 30 to 40cm and 81.9% of subjects were using VDTs at night in bad ergonomic conditions. These findings point to the height of the health issue, which needs to be addressed with clear instruction for the use of proper screen protections and safety time cut-offs for the use of computer screens

Key Words: Computer vision syndrome, Ergonomics, visual display units, ocular complaints

INTRODUCTION

Since the introduction of computers, several screen-related effects have been reported among long-term users and professionals. The group of these symptoms and signs is now termed as "Computer Vision Syndrome" (CVS) or digital eye strain. The American Optometric Association defines it as *a collection of eye and vision-related issues that emerge from extended computer, tablet, e-reader, and mobile phone use*(1). The syndrome is comprised of complaints including dry eyes, irritation causing redness, strain/fatigue in the eyes, blurring of vision, burning sensation, excessive tearing and double vision. Some patients also report having light sensitivity and headaches with digital eye strain. It is also reported that CVS is commonly occurs due to prolonged exposure to computer screen without proper light and in appropriate screen brightness. The suitability of the workstation layout is also important along with any pre-existing eye condition(2). Computer vision syndrome reportedly became the most common occupational hazard of this century resulting from technology development, affecting over two thirds of all the smart device users globally making it one of the most common public health issues in the world(3). The symptoms associated with CVS also cause decline in productivity at work, rise in human errors, reduction in quality of work satisfaction, and decline in visual ability(4). Global statistics suggest around 60 million people are suffering from CVS, with a rise of one million new cases each year (5). The prevalence of VDT-related eye disorders varies greatly among studies, due to variation in the selection criteria, methodologies adopted for sample

collection and research instrument used(6,7). In a review by Thomson et als stated that ~90% of computer users may have symptoms associated with CVS after prolonged screen exposure. Another study reported from Abuja, Nigeria, had 40% of VDT users experiencing at least one symptom of CVS(8). While in Sri Lanka two-thirds of computer office workers suffer from CVS, according to the national research(9). A couple of studies were reported from Gondar, Ethiopia, where more than 70% of secretaries, data processors, and bankers, who mainly work on computers, are presenting with CVS(10,11). According to other studies, the frequency of CVS ranging from 75% to 90% among workers exposed to VDT during most of their working hours (12). The reported rate from Italy was 31% (n = 212), India 46% (n = 400), Australia 63% (n = 1000), and Spain 68% (n = 35) of computer use related visual symptoms(13–15). According to these studies, almost 75% of participants spending six to nine hours per day in front of screen, experience some degree of ocular discomfort. The difference in the rate of development of visual symptoms largely depends upon the number of samples they have included. There is little evidence showing that CVS symptoms cause lasting eye damage and vision impairment. There is also limited literature available from Pakistan. Given the rising use rate of computers in all offices, it is important to explore the rate of CVS in our population. This study aimed to discover the pattern of computer vision syndrome disorders in young adults, presenting at a single centre.

METHODS

This was a cross-sectional study conducted at Al-Ibrahim eye hospital, Karachi, Pakistan, for 6 months (April to December 2020). The patients presenting with complaints of eye strain, dry eyes, blurred vision, burning eyes, and headache, aged between 18 to 35 years, and at least 2 hours of exposure to any sort of VDT, were included using a non-probability convenient sampling technique. Patients with uncorrected refractive errors, convergence insufficiency, fundus pathology, medication effects, and mentally retarded patients were excluded. Informed consent was taken from all patients, when they agreed to be part of the study data was collected using a pre-designed questionnaire. Statistical analysis was done by using Statistical Package for Social Science (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp). All the continuous variables were presented as mean and standard deviation (± SD) and all categorical variables were presented as frequency and percentage.

RESULTS

Mean age of the patients was 20.4 years. Gender wise distribution showed that 74 (53.6%) were males and 64 (46.4%) were females. Around 78.2% of study populations had refractive errors. Myopia was the most significant refractive error in 53.6% of the study population. Among study population, 34.8% were using electronic gadgets for 3 to 5 hours. The prevalence of CVS was found to be 89.1%. Headache was the most prevalent symptom (68.8%). The screen was viewed by 94.9 % of participants at a distance of 30 to 40cm. In poor ergonomic settings, 81.9 % of the subjects used VDTs at night. A summary of the types of refractive errors reported in the study is given in Table 1.

Table 1. Distribution of type of Refractive Error reported in the study population

Refractive Error	Frequency	Percent
Myope	74	53.6
Hypermetropia	7	5.1
Astigmatism	27	19.6
Emmetropia	30	21.7
Total	138	100.0

DISCUSSION

The mean age of our study sample was 20 years, and most males were reported to have CVS symptoms. The findings of our study were consistent with a study reported from Saudi Arabia including students and stated 21.4±1.9 years mean age and that three-fourth population suffering from CVS were males. It is though interesting that younger males are complaining of the screen related issues. It is also in line with the pattern of social system where males work more in offices and in front of computer screens than females.

In our study, a higher rate of refractive errors were observed (i.e. 78.2%) compared to the previously reported study by Margareta C et al where it was reported to be 55.6%. This might have influence of the sample type included in the study. This might also have an association with the make-up and quality of screens used(16). As we did not include the type of monitors of computer screens thus it is difficult to make exact correlation. Our study reported that a considerable number of participants use electronic devices around five hours a day for a minimum of three hours. These findings are in line with the previously reported study by Zairina et al where 42.9% of the study population was using computer around 5 hours per day. While these findings contradict a report from Delhi, India where great majority was using screens six to nine hours a day, 26% of the study population stated to spend more than nine hours a day on the computer(17).

Overall it was found that 89% of patients reported in our centre had computer related ocular issues which fall under computer vision syndrome among young adults. The rate reported in our study was a little higher than the number seen in a study by Pulla A et al, where it was reported to be 60.3%. Again, this seems to be influenced by the type of sample selected for the study and the way of data collection and also here is also a chance of recall bias from the participants.

The most common symptom reported in our study was headache (68.8%), then eye strain or fatigue (i.e. 46.2%), while half of the study population had watery eyes, another 15% and 20% had redness and blurring respectively. These findings are comparable to the study by Talwar et al where 76% of the study population had visual symptoms with computer use and most common was watering of eyes, pain and irritation, burning and redness, blurred vision and headache. There was another study reported from Malaysia, which also reported headache and eye strain as the most frequently presenting features after use of computer screens.

The study has highlighted an important occupational and general heath issue in public, particularly working class of our population. Where the use of computers resulting in ocular problems. The study has not explored the exact duration of the used of screens also the use mobile phone screen was not particularly individualized, are the limitation of the study. The make of computer monitors is also an important aspect that was not included in this study, as it was beyond the project's scope.

CONCLUSION

The majority of young adults using computers at the workplace nowadays, thus, this study has reported a considerable number of young adults suffering from Computer vision syndrome. Further studies are required to find significantly influencing factors and develop strategies to control this major ocular problem.

ETHICAL APPROVAL

The study was approved by the institutional review board/ethical review board. (REC/IPIO/2020/008)

CONFLICT OF INTEREST

Authors declared no conflicts of interest

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