COMPUTER VISION SYNDROME AMONG NURSES
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Abstract

Eye- and vision-related symptoms are the most frequent health problems among computer users. The aim of this study was to estimate the Magnitude/prevalence and to describe risk factors associated with Computer Vision Syndrome among computer users. A quantitative cross sectional survey approach was used to attain the error free outcomes. Sixty computer users were selected, which comprised of both teaching faculty and post graduate student nurses for this study. The symptoms related to eye and musculoskeletal system which were reported were moderate head ache (64%), bodily fatigue and tiredness (44%), burning eyes (72%), blurry vision (40%), mild dry eyes (55%), neck and shoulder pain(69%), double vision (47%),"halos" appearing around the objects (67%) and need to interrupt work frequently to rest eyes (47%). Also few factors such as length of use (in years), type of work, type of device, duration of use (in hours/days), size of the device and frequency of eye blinking was posses the remarkable impact on incidence of computer vision syndrome. Treatment modalities include a multidirectional approach combining ocular therapy with adjustment of the workstation, proper lighting, anti-glare filters, ergonomic positioning of computer monitor, ergonomic exercises and regular work breaks. This may improve the visual comfort of the computer users.

Key words: Computer Vision syndrome, Faculties, Students.

Introduction

Technological advancement has made an impact in almost every aspect of our lives especially after the availability of computers. It has improvised the processing speed of many tasks; abundant work can be done in minimal time by accessing enormous quantities of information and also we can engage in several tasks simultaneously. The rapid advancement in the technology and popularization of various gadgets and their application have made rapid changes in the exposed profiles of the population at work, at school, at home and in leisure over a few decades. Millions of people including children, college students are using computers for prolonged hours. Therefore, it is important to examine potential effect on health after exposure.

Computers are ubiquitous. As computers have become less expensive they have been purchased by more and more families for their homes. The computer users reported the drawbacks of its usage such as eyestrain, tired eyes, headache, blurred vision, irritation, burning sensation, redness, double vision, neck pain, and backache which might be caused by combination of individual visual problems, poor work place conditions and improper work habits.[1,2]

Now-a-days, adolescents in universities are using computers for their studies and research projects. In addition, computers are also used by the students, community for non-academic purposes such as watching movies, playing games and online social networking.[3]

In the past two years Computer Vision Syndrome (CVS) has experienced a dramatic surge by about 15% world wide. The incidence of CVS about 5years ago was just 8%. But it can be seen in every one out of four patients visiting ophthalmic OPD's are with the symptoms of CVS. The cases have been witnessed more among children addicted to video game whereas IT professionals comprises about 70%.[4]

A million new cases of CVS occurs every year.[5] Many studies have reported the association between prolonged computer use, poor postures at

workstations and various musculoskeletal discomforts, however most of these studies focused on western adult subjects.[6,7,8] Very few researches have been performed to document the effects of computer use on the physical health especially among college students and faculty in Indian scenario.

Hence, this study was designed to study the magnitude of CVS and it's associated factors among the student nurses and faculty.

Methodology

A quantitative cross sectional survey was carried out to investigate the magnitude of Computer Vision Syndrome and its associated factors. The universe of the study population comprised of all the post graduate student nurses and nursing teaching faculty. Participants diagnosed with eye disease, age more than 50 years and using spectacles were excluded from the study populations. Consecutively 60 study participants were recruited for the study after the exclusions. Informed verbal consent was obtained from all the study participants. The investigator has used various tolls to measure the magnitude of the CVS in sample by questionnaire on demographic variables and Self-reported checklist regarding CVS.

Results

Distribution of selected demographic variables -

- Three fourth (75%) of the study participants were in the age of <30 years.
- Both males (58%) and females (42%) more or less equally participated in the study.
- Half (50%) of the study participants were using other than CRT and flat type of screens.
- Maximum (43%) number of participants had worked with computers for more than 10 years.
- 33-47% of them reported that they were using computer devices for internet and word processing types of jobs.
- Majority (64%) were using device other than PC and Laptop.
- Less than half (40%) participants were

working with computer devices less than an hour in a day.

- Large proportions (70%) were using devices with screens of 17 inches or more.
- Two third (67%) of the participants blinked twice as frequently against non-computer users.

Table:1 Frequency and percentage distribution of nursing teaching faculty according to their demographic Variables

S. NO.	Demographic Variables		Milld	Moderate	Severe	Sig
1	Age in years	<30	5	20	20	2.30
		31-40	3	3	6	
		41-50	1	0	2	
2	Gender	Male	9	15	11	1.4
		Female	6	7	12	
3	Type of screen	CRD	8	3	1	4.16
		Flat Screen	5	3	0	
		Others	14	14	2	
4	Duration of Use (in years)	<6	1	01	17	0.00001
		7-10	1	1	14	
5	Type of work	>10	8	3	15	0.05
		Internet	4	6	18	
		Programming	0	2	6	
		Games	2	1	1	
		Word processing	1	4	15	
6	Types of Device	PC	2	0	6	0.04
		Laptop	1	7	6	
		Others	2	30	6	
7	Duration of use (in hours/day)	<1 hrs	3	5	16	0.002
		1-4 hrs	4	0	12	
		4-8 hrs	3	5	6	
		>8 hrs	5	1	0	
8	Size of the device	Less than 14 inches	3	1	4	0.03
		14 - 17 inches	1	5	4	
		More than 17 inches	2	10	30	
9	Frequency of eye blinking	Twice as frequently	5	1	1	0.0001

Discussion

A very small sample size and unique composition of the study population makes it difficult to compare this study with other available studies that are invariably community based, have larger sample sizes and varying socio- economic characteristics. In the present study approximately two third of the study participants reported moderate headache during or after working with the computer. It might be associated with sitting for lengthy periods in fixed postures at computer terminals. Smithe L,

Louw Q,Crous L, Grimmer- Somers K.(2009) also reported significant association between neck pain and high hours of computing among school students. [9]

Fifty percent of the participants reported moderate fatigue and tiredness while working with computer. Hege Crowton supported the present study findings that spending long hours in computer can put ones health at serious risk such as chronic fatigue. [10]

Approximately two third of the total participants felt moderate burning sensation while working with computers. Almost every other participants experienced mild dry and tired eyes. Almost all the participants complained of mild, moderate and severe blurred vision. A large proportion of them complained of moderate neck, shoulder or back pain. Most of the computer users were experiencing mild and moderate double vision. Melita Pereira, Ajimol Sebastian, Sandra Ashalatha, Latha T, Bharathi (2013) highlighted that the physical problems of computer users, like tiredness of eyes was the most common problem followed by eye strain, blurring, burning sensation, irritation and discomfort. Headache, shoulder pain with stiffness, neck pain with stiffness, backache, and wrist pain were frequently reported musculoskeletal problems. [11]

Majority had reported that mild squinting was helping to improve their discomfort. Nagourney E. (2005) said squinting, a common practice among computer users and it helped them to prevent dry eye and the irritating symptoms that come with it. [12]

 Most of the participants often experienced letters on the screen running together and "Halos" appear around objects on the screen. It was supported by Stella C. Chiemeke Member, IAENG, Allen E. Akhahowa and Olajire B. Ajayi (2007). One fourth (26.2%) of computer using employees complained about letters on the screen running together often and 33% employees experienced sometimes circles of light around objects. [13]Almost all the computer users accepted that mid way rest during work ensures comfort to their eyes. M Logaraj, V Madhupriya, and SK Hegde (2014) concluded that students who took frequent breaks in their work were at lower risk of developing symptoms of CVS compared to those who do not [14].

There are many factors contributing to vision related problems. In this study it was found that working with internet and word processing worsened their vision. Highly significant positive correlations were found between low vision and BMI, hours spent reclining and on the internet respectively. [15] Users who used gadgets other than personal computer and Laptop experienced eye problems more often. Bazan J. (2012) said that CVS is caused by two factors, Computer, tablet and Smartphone screens are typically held close, which causes eye strain and weakening of the eye's focusing muscles. [16] Higher the duration more the risk of CVS significantly. It was correlated with findings of the study done by M Logaraj, V Madhupriya, SK Hegde (2014). Using computer for 4-6 hours were significantly at higher risk of developing redness, burning sensation and dry eyes as compared to those who use computers for less than 4 hrs. [14]

Higher and incomplete frequency of blinking indicates that computer users were prone

to get computer vision syndrome. The recent studies showed positive correlation between the percentage of incomplete blinks and the symptom score. [17] Incomplete blinking was associated with straining patterns in the inferior cornea in some studies. [18]

However, it was proved that using small computer screens and prolonged use (in years) of computers may also lead to computer vision syndrome.

Factor like gender was not statistically associated with the incidence of computer vision syndrome. It is contradictory to Shantakumari N., Eldeeb R., Sreedharan J., Gopal K. (2014) study findings that females had significantly higher incidence of headaches and blurred distant vision than males. [19]

Conclusion

The current study highlighted the occurrence of various health related, especially vision related health problems in various degrees among the computer users.   These study findings confirmed that there is a significant need to educate new computer users   about appropriate ergonomics, postural health and eye exercises.

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