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Assessment of vision problems among computer users at DRPCAU, Pusa

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Abstract

Computer Vision syndrome is a group of symptoms experienced by a computer user as they performed prolong work on a computer. To study the socio-economic characteristics and vision related problems of computer users. A pre structured questionnaire was prepared to collect all the data of computer users working in DRPCAU campus. The questionnaire contained demographic profile users and vision related problems of the computers. Half of the computer users were male and other half were female. Majority of the computer users were between the age group 20-30 years. 75 percent of computer users were post graduate having monthly income more than 20,000/-per month. All the respondents were using spectacles during their work. 78.33 percent of the computer users had experienced eye watering and 36.67 percent had blurred eyes while working with computer. 70 percent respondents had double vision, 46.66 percent had faced burning sensation while reading from computer screen. Age, Education and Income were positively significant, while work environment was negatively significant to the difficulties faced during both working with computer and reading from computer screen. CVS is a complex symptom. Most of the computer users are suffering from CVS, who worked more than 4 hrs in a day with computer.

Keywords: Computer vision syndrome, computer users, symptoms, work environment

Introduction

In the present generation, computer has become an essential part of the everyday life to perform their day to day activities. Almost 75 percent of the computer user's day today activities include computer use. It is very difficult to imagine our life without computer, internet, mobile phones and electronic gadgets. Some years back increasing number of people were using computers for their official and personal use. In nineties people were mainly using computer to do their office work but now a day's computer is being used to do lot of tasks like reading, writing, typing and different types of animation, data entry, networking, watching movies and gaming etc.

Worldwide, around 60 million computer users faced discomfort from computer vision syndrome. Computer vision syndrome is the most common complaint by the computer users. Almost 45 million of users utilize computer by watching continuously at the screen for hours (Ghufran *et al.* 2020) [5]. The American Optometric Association (AOA) stated that computer vision syndrome as a complex of eye and vision problems related to the activities, which gives stress the near vision and which are encountered during the use of computer. Symptoms of computer vision syndrome (CVS) are referred as Digital Eye Strain (DES) which include eye strain or fatigue, dry eyes, irritated eyes, red eyes, excessive tearing, burning eyes, double vision, blurred vision, headache, sensitivity to light or glare, slowness in changing focus and changes in colour perception. Computer related vision syndrome (CVS) leads to occupational hazards and its symptoms affect nearly 70 percent of all computer users (Dessie *et al.* 2018) [4]. Computer vision syndrome (CVS) is the major public health related disorder, which reduces the productivity at work and causes impaired visual abilities. Visual Display Terminal (VDT), workplace, lighting levels, glare and high demanding visual tasks contribute in the development of complaints and visual symptoms.

Visual problem is a decreased ability to see to a object at a certain degree. The most frequent discomfort amongst the computer users is visual discomfort, as the computer users work for a long period in front of the computer screen. Poor lighting, improper height of computer screen and reflection due to glare were the various factors, which lead to vision discomfort and eye fatigue.

Due to prolonged hours of sitting in front of the computer screen, the majority of the respondents faced, various vision related problems such as eye strain, irritation in the eyes, redness in the eyes and burning sensation of eyes (Bali *et al.* 2014) [2].

Reflection of glare was the main cause of difficulties felt in eyes, while reading from computer screen. Various problems related to computer screen were difficulty in focusing, tear flow, disappearance of words, burning sensation, double vision effect and eye strain. Eye strain is the important symptoms, which leads to permanent vision problem (Akinbinu and Mashalla, 2014) [1].

Materials and Methods

Selection of Study Area: The present study was conducted in Dr. Rajendra Prasad Central Agricultural University Pusa, Pusa Block office, Kendriya Vidyalaya, Pusa and Uma Pandey College, Pusa.

Selection of Sample: Out of 60 respondents, half respondents were male and half were female. 30 respondents from the university, 10 respondents from Block office, 10 respondents from College and 10 respondents from the school were selected purposively.

Data Collection: A pre-structured interview schedule was developed to gather information and self-observation technique and was also used to evaluate information related to

the condition of work environment. Field survey was accomplished in following step by step procedure.

Results

Gender: It is obvious from the mentioned Table1 that half of the computer users were male and half were found to be female. In this scenario, the study's results are attributed to the fact that fifty percent of the samples were taken on purpose for both male and female subjects.

Age: The data in Table1 shows that the majority of computer users (48.33%) were in the age group (20-30 years), followed by 43.33 percent in the age group (30-40 years), and 8.34 percent in each of the age group (40-50 years) and (50 years and above). According to this report, the majority of computer users fall under the ages of 20-30 years.

Education: In terms of respondent educational levels, Table1 indicates that three-quarters (75.00%) of the respondents were postgraduates, followed by graduate (23.33%) and intermediate respondents (1.67%).

Monthly Income: Results focussed that more than three-quarters of respondents (86.66%) had their personal monthly incomes of more than Rs 20,000 per month. Only 6.67 percent of computer users got their income of Rs 10,000-15,000 per month and between Rs 15,000-20,000 per month.

Table 1: Distribution of Computer users by their Socio-economic Characteristics

S. No.	Gender	Particulars	Frequency	Percentage
1.	Male	30	50.00	50.00
2.	Female	30		
Age				
3.	Below 20 years	-	-	
4.	20-30 years	29	48.33	
5.	30-40 years	26	43.33	
6.	50 years and above	5	8.34	
Income				
7.	Up to Rs. 10,000/-	-	-	
8.	Rs. 10,000-Rs. 15,000/-	4	6.67	
9.	Rs. 15,000-Rs. 20,000/-	4	6.67	
10.	Post Graduation and above	52	86.66	

Angle between eyes of the user and computer screen: Angle between eyes of the users and computer screen plays an important role in development of computer vision syndrome and work related musculoskeletal disorders. From the Table2 it was resulted that most of the computer users (66.67%) were working at an angle (450-600), while 23.33 percent respondents had worked at an angle less than 300. 6.67 percent respondents had placed their computer screen at an angle greater than 300.

Size of the Computer Screen: Regarding the size of the computer screen, it is seen that percent of the computer users were using 14 inch size of the computer screen followed by

the respondents who were using computer of various size i.e.14.5 inch (31.66%), 15 inch (5%), 19 inch (5%) and 21 inch (3.33%).

Use of spectacles: Maximum numbers of computer users (53.33%) were using spectacles as they were suffering from vision problems.

Types of lighting: From the mentioned Table it was expressed by the maximum of computer users (56.67%) were using fluorescent lighting, while 43.33 percent of the respondents were using natural lighting.

Table 2: Distribution of Computer users by their different computer parameters

S. No.	Particulars	Frequency	Percent
Computer screen (Inch)			
1.	11	1	1.67
2.	14	29	48.33
3.	14.5	19	31.66
4.	15	3	5.00
5.	19	3	5.00
6.	21	2	3.33
Angle between computer screen and user			
7.	Less than 30o	14	23.33
8.	Greater than 30o	4	6.67
9.	Between 45o and 60o	40	66.67
10.	Greater than 60o	2	3.33
11.	Spectacles		
12.	Yes	32	53.33
13.	No	28	46.67
Type of lighting			
14.	Fluorescent	34	56.67
15.	Incandescent	-	-
16.	Natural light	26	43.33

The visual discomforts of respondents were assessed in two methods such as:

1. Difficulties in eyes, while working with computer

2. Difficulties in eyes, while reading from computer screen
3. Difficulties in eyes, while working with computer

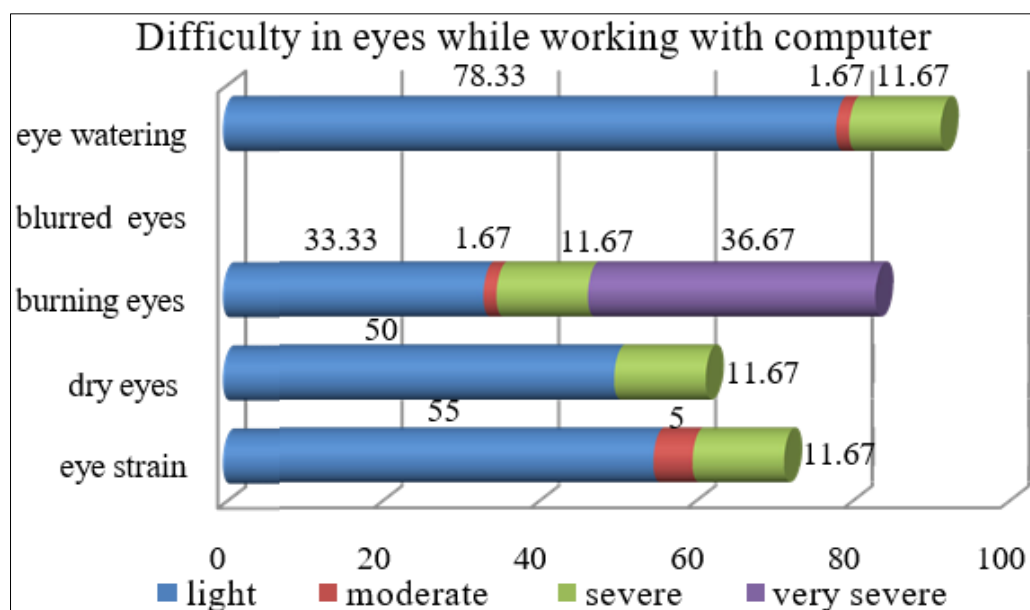


Fig 1: Distribution of computer users by their difficulties, while working with computer

Headache: Headache is one of the major problems related to vision related problem of computer users. From the Figure 1 it was observed that 45.76 percent of the respondents were facing headache due to the reflection glare of the computer screen or the glare present on the screen.

Eye strain: From analysis of data showed that respondents (11.67%) felt severe eye strain followed by 5 percent respondents had moderate eye strain. Majority of the respondents (55%) felt light eye strain, which was the initial stage because of working long hours with the computer screen.

Dry eyes: The respondents felt their eyes were dry due to continuous working with the computer screen. As fifty percent of the respondents expressed their light dry eyes, while remaining 11.67 percent of the respondents felt severe

dry eyes, which may lead to chronic disease of eye.

Burning eyes: It is clearly indicated that continuous staring at the computer screen leads to burning eyes. Very severe burning eyes was felt by the respondents (36.67%) followed by light, severe and moderate level of burning eyes reported by the respondents (33.33%, 11.67% and 1.67% respectively).

Eye watering: Eye watering was found to be another important symptom of vision problem. It was noted that majority of the respondents (78.33%) expressed that they had light eye watering symptoms, which was followed by the respondents (11.67%) of severe eye watering and only less number of respondents (1.67%) had moderate eye watering symptoms, which gradually increases and leads to severe in future.

Difficulties in eyes, while reading from computer screen

Difficulty in Focusing: As the computer users sits before computer screen for a longer time the user sometimes feel difficulty in focusing, while reading from the screen. As per the analysis of the study, 46.66 percent of the respondents felt light level of difficulty in focusing and 35 percent of the respondents had experienced moderate difficulty in focusing.

Tear Flow: It was found that the respondents (11.67%) stated that they had suffered moderate level tear flow, while less number of respondents (8.33%) had light level of tear flow from eyes.

Disappearance of words: It was indicated that among all the respondents forty percent had experienced light level of disappearance of words and only (23.33%) had experienced disappearance of word moderate.

Burning Sensation: It was observed that maximum

respondents (46.66%) had burning sensation and remaining 11.67 percent of respondents experienced moderate burning sensation in their eyes.

Double vision affect: Double visions affect means appearance of same thing seen twice at a time. Seventy percent of the respondents slightly suffered from double vision affect of visual problem while 18.33 percent respondents were recorded as moderately suffered from double vision problems.

Eye strain: Eye strain was observed as a common symptoms of eye, while working with computer as well as reading from computer screen. Findings of the study highlighted that respondents (41.67%) faced moderate eye strain, which was followed by the respondents (36.67%), who had severe eye strain and a very few respondents (10%) had got affected with light level of eye strain.

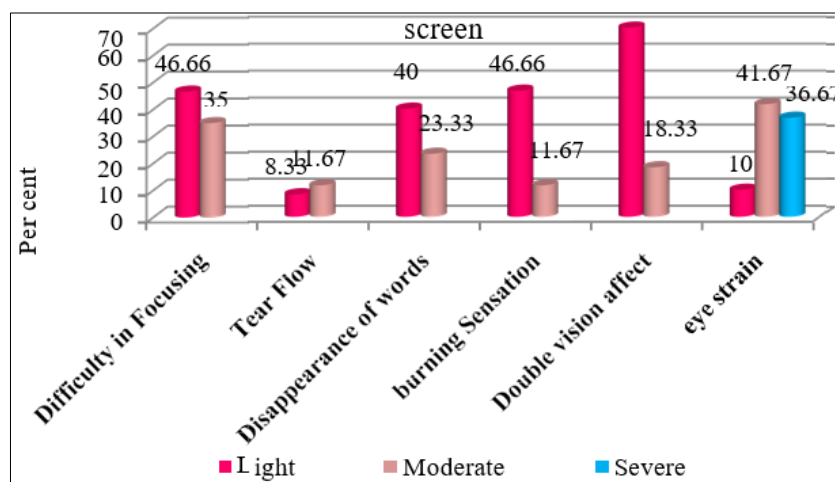


Fig 2: Difficulties in eyes, while reading from 70 computer

Relationship of socio-economic background with the difficulties

An analysis of data in the Table3 expresses that there was significant co relation between the respondents difficulty in eyes with all the selected variables. Age, education, gender, income were positively and significantly correlated with the difficulty in eyes, while working with computer, whereas work environment was negatively correlated with difficulty in eyes while, working with computer. It reveals that as the age increases the difficulty also will increase, as the age, education, gender and income of the respondent increase, the efficiency of the respondents' decrease, which reduces the output rate. Whereas, the value of work environ difficulty in eyes during computer work decreases and vice-versa.

Table 3: Relationship of difficulty in eyes during computer work with background

Variables	Correlation co-efficient 'r'
Age	0.221*
Education	0.256*
Gender	0.172*
Income	0.218*
Work environment	-0.303*

*Significant at 0.05 level

An analysis data of the table4 highlighted that the selected variables like age, education, income, work environment and

the difficulty in eyes, while reading materials from computer screen were significantly correlated. That means, by increasing the value of age, education, gender and income, the value of difficulty in eye while reading from computer screen will also increase.

The results showed that the work environment of computer users was negatively correlated with the difficulty in eyes while reading materials from the monitor. It also revealed that as the value of work environment of computer users' increases, the value of difficulty in eyes while reading from monitor decreases because the computer users always prefer to read the materials from the monitor only and the improper work environment didn't support them to work properly. However, gender of the computer users was not found to be not correlated with the difficulty in eye while reading from computer screen.

Table 4: Relationship of difficulty in eyes while reading from computer screen with socio-economic background

Variables	Correlation co-efficient 'r'
Age	0.266*
Education	0.255*
Gender	0.108
Income	0.108
Work environment	-0.287*

*Significant at 0.05 level

Discussion

This findings of gender is quite similar to (Moom, 2015) ^[9] who conducted his study between male (60%) respondents and female (40%) respondents.

The results related to age were in consonance with (Gupta, 2012) ^[7] noted that 41 percent of the computer users belonged to the age group 31-35 years, 28 percent belonged to the age group 36-40 years and 26 percent of the computer users came under the age group of 26-30 years.

The results were contradictory to the study of (Kaur, 2014) ^[8] who divulged that more than half of the respondents were post graduates followed by graduate and intermediate.

The findings were quite similar with the study of (Reema, 2018) ^[15], who found that more than half of the computer users had income in the range of Rs. 10001-20,000, while 36 percent of the computer users had income up to Rs. 10,000 and 7.50 percent had income of more than Rs. 20,000.

According to Shikdar (2007) ^[16], 150C-300C is the viewing angle for a computer user.

Visual strain is influenced by place of video display terminal relative to eye. The heights of the visual object related to the eyes and the distance of viewing from the eyes to the screen are the two main parameters of VDT position. Ranasinghe *et al.* (2016) ^[12] observed in the study that 35 percent of the respondents placed their upper edge of the computer screen at the eye level.

The results were quiet similar to Kaur (2014) ^[8], who found out that 64.17 percent of respondents were using spectacles. It was also similar to the study of Reddy *et al.* (2013) ^[13], who found that 68.3 percent of the students were using spectacles and 31.67 percent of them were using contact lenses.

Proper lighting is essential for the production of more works in an efficient way, which will enhance the productivity by maintaining product quality (Deb, 2018) ^[3]. It was also supported by Shikdar (2007) ^[16], who found that an important visual environmental parameter for a computer workplace was lighting.

The findings were little familiar with the study of Portello *et al.* (2012) ^[11], who reported that 40 percent of the subjects had felt tired eyes, while 32 percent of them had experienced dry eyes. It was also noticed that 31 percent of the subjects had faced eye discomfort.

The findings of the present research were in consonance with the study of Bali *et al.* (2014) ^[2] observed that about three quarter of the computer users were suffering with vision syndrome like burning sensations, irritation, dry eyes, eye-strain, redness of eyes, tired eyes, double and blurred vision.

The findings were equivalent to the study of Shanta Kumari *et al.* (2014) ^[16], who reported that the common symptoms of visual problems were burning sensation in eyes, headache, tired eyes, dry eyes, and sore eyes. The variables and the duration of computer use were negatively significant with dry eyes, sore eyes and tired eyes.

Conclusion

CVS is a repetitive stress disorder characterized by a symptom complex of eye-strain, tired eyes, eye-watering, irritation, burning sensations, dry eyes, blurred, difficulty in focusing, disappearance of words and double vision experienced by computer users. Prevalence of Computer related vision problems was found to be greater among the computer users of DRPCAU campus. Age, Education, Gender, income and work environment were the most important determinant factors for vision problems. So

minimizing the exposure of timing and providing awareness about the good postures for computer users are important to tackle the problems.

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