Original Research Article

Effects of Computer Usage on Eyesight in Gulbarga city

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Abstract

Introduction: Computers are used in a broad range of occupations and their use is increasing. Many computer operators' experience various eye and vision related symptoms and ocular discomfort.

Methods: To know the effects of computer usage on eyesight and its prevalence, a cross sectional study was conducted in Gulbarga city covering 4 Engineering colleges i.e. among 319 third year computer engineering students and 79 teaching staff for 1year from January 2011 to December 2011. The study population were interviewed using pre-designed and pretested pro-form and Snellen's chart was used to measure visual acuity.

Results: Amongst study subjects low vision were more common among those, who rests their eyes sometimes (right eye-9.1%, left eye-9.4%) and least among those, who rest their eyes always (right eye-2.3%, left eye- 2.5%).

Conclusion: In our study low vision were more common among those, who rests their eyes sometimes. Vision problems can be reduced by appropriate adjustment and placement of the computer and good preventive vision care habits.

Keywords: Computer related eye problems, Computer vision syndrome, Visual problem.

Introduction

Computer has become an important part and parcel of our daily life and we have become addicted to it. It has made our daily life simpler and easier but at the same time has given many health problems. Many computer operators' experience various eye and vision related symptoms and ocular discomfort.

With the amount of computer usage the level of discomfort appears to increase.[1,2] Computer related symptoms including Visual discomfort occurring in computer workers must be recognized as a growing health need.[3] The complex of vision and eye problems related to near work experienced during computer use has been called computer vision syndrome.

Aims and Objective

1. To know the prevalence of Refractive error among students and teaching staff of computer engineering colleges in Gulbarga city.
2. To recommend preventive measures for visual problems among study population.

Methodology

To know the effects of computer usage on eyesight and its prevalence, a cross sectional study was conducted in Gulbarga city covering 4 Engineering colleges i.e. among 319 third year computer engineering students and 79 teaching staff for 1year from January 2011 to December 2011. The study population were interviewed using pre-designed and pretested proform and Snellen's chart was used to measure visual acuity.

Inclusion criteria: Computers users including Students and teaching staff working on computers for minimum of 3hours continuously per day for 3 times in a week for 6 months are included as the study subjects.[4] Teaching staff and third year computer engineering students of computer science department of Engineering colleges are included in the study after consulting with their head of department.

Exclusion criteria:
1. Computer engineering students belonging to first, second and final year and teaching staff.
2. Staff and Students belonging to other departments of engineering colleges.

Study tool: The study subjects were interviewed using pre-designed and pretested proforma and Snellen's chart was used to measure visual acuity.

Snellen's Chart: A Snellen's chart is an eye chart used by eye care professionals and others to measure visual acuity.

Visual acuity = Distance at which test is made / distance at which the smallest optotype identified subtends an angle of 5 arcminutes.[5]

The study data was analyzed by using proportions and chi square test. The statistical software SPSS 12 is used for the analysis of the data and Microsoft word

and Microsoft Excel have been used to generate graph, tables and figures etc.

Results and Discussion

The study subjects have got practical classes for 3hr in a day hence majority (41.2%) of them work on computers for 3-6hr followed by 29.4% less than 3hour, 18.84% for 6-9 hour and 10.55% for more than 9 hr (**Table 1**) which was similar to study done by Richa Talwar et al[4] (2009) on computer professionals in Delhi reported that 44% individuals worked in front of computers for 6-9hours followed by 30% for 3-6hours and 26% for more than 9hours per day.

The subjects were third year computer science students and teaching staff therefore majority (48.99%) have 3-6yr computer exposure followed by 101(25.37%) less than 3yr, 56(14.1%) for more than 9yr and 46(11.6%) for 6-9yr (**Table 2**) which is approximately similar to study done by A K Sharma et al[6] on IT professionals with varied job profiles in New Delhi in 2006, where in majority 36% worked on computers for 3-6years followed by 17.5% for 6-9years, 15.5% for <3years, 14% for 12-15years, 13.5% for 9-12 years and 3.5% for >15years.

Visual acuity and study subjects

The study reports that 327(82.16%) have right eye normal vision and 325(81.65%) left eye normal vision while 71(17.83%) have right eye low vision and 73(18.34%) left eye low vision (**Table 3**) which were in contrast to survey done by A. Sen et al[7] (2007) among 136 under graduate students (studying computing or medicine) in Malaysia where in 64% were using refractive corrections and still had high scores of Computer Vision Syndrome(CVS).

Association between resting of eyes while working on computers and visual acuity

The study shows that low vision were more among them who rests their eyes sometimes (right eye-9.1%, left eye-9.4%) followed by often (right eye-3.6%, left eye-4.03%), never (right eye-3.02%, left eye-2.7%) and least among those, who rest their eyes always (right eye-2.3%, left eye- 2.5%) (χ^2 =0.128, 0.202, p>0.05) (**Table 4**).

A Sen et al[7] (2007) in their study done in Malaysia among 136 under graduate students (studying computing or medicine) revealed that 64% were using refractive corrections and still had high scores of Computer Vision Syndrome and the increase of Computer Vision Syndrome scores which correlated with increase in computer usage spells. Husnun Amalia et al[8] (2010) in their study among 99 computer science students of university of Indonesia reported that 69.7% had asthenopia and another symptoms were visual fatigue (p=0.031), heaviness in the eye (p=0.002), blurred vision (p=0.001).

Table 1: Proportion of the study subjects according to the duration of working on computers in a typical day

Duration	Male	Female	Total
<3hr	41(33.1%)	76(27.73%)	117(29.4%)
3-6hr	48 (38%)	116(42.33%)	164(41.2%)
6-9hr	31(25%)	44(16.05%)	75(18.84%)
>9hr	4(3.23%)	38(13.86%)	42(10.5%)
Total	124(100%)	274(100%)	398(100%)

Table 2: Proportion of the study subjects according to the duration of using computers (in years)

Duration	Male	Female	Total
<3yr	38(30.6%)	63(22.99%)	101(25.7%)
3-6yr	58(46.8%)	137(50.0%)	195(48.99%)
6-9yr	10(8.06%)	36(13.1%)	46(11.6%)
>9yr	18(14.5%)	38(13.9%)	56(14.1%)
Total	124(100%)	274(100%)	398(100%)

Table 3: Distribution of the study subjects according to the visual acuity

Types of problems	Male				Female				Total			
	Right		Left		Right		Left		Right		Left	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Normal (6/6-6/18)	99	71.8	99	71.8	228	83.2	226	82.5	327	82.16	325	81.65

| Low vision (6/18-6/60) | 25 | 20.16 | 25 | 20.16 | 46 | 16.8 | 48 | 17.5 | 71 | 17.83 | 73 | 18.34 |
| Total | 124 | 100 | 124 | 100 | 274 | 100 | 274 | 100 | 398 | 100 | 398 | 100 |

Table 4: Association between resting of eyes while working on computers and visual acuity

Resting of eyes	Visual acuity											
	Normal				Low Vision				Total			
	Right		Left		Right		Left		Right		Left	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Always	88	22.1	87	21.8	9	2.3	10	2.5	97	24.37	97	24.37
Sometimes	132	33.16	132	33	36	9.1	36	9.4	168	42.21	168	42.21
Often	49	12.31	46	11.5	14	3.6	16	4.03	62	15.5	62	15.58
Never	58	14.57	60	15	12	3.02	11	2.7	71	17.84	71	17.84
TOTAL	327	82	325	81.4	71	18	73	18.63	398	100	398	100
χ^2 value	0.128				0.202							
P-value	p>0.05				p>0.05							

Conclusion

In our study low vision were more common among those who rests their eyes sometimes and least among those, who rest their eyes always during usage of Computers. The growing use of computers for enhancing efficiency and effectiveness of the work has caused visual problems resulting in computer vision syndrome impairing workplace productivity and reduces the quality of life.

Recommendations

1. Education about computer visual problems and its prevention amongst people at risk is highly recommended.
2. Potential vision problems relating to VDT use can be reduced or eliminated by appropriate adjustment and placement of the computer, proper workplace design and lighting control, good preventive vision care habits.[9,10]
3. Very few studies have been done on this topic in India. It will be useful to take up more studies on Computer related health problems among staff and students in colleges and universities.

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Conflict of interest: The authors deny any conflicts of interest related to this study.

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