Original Research Article

Prevalence of dry eye amongst computer workers in Kanpur

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ABSTRACT

Background: The increased use of computers in the workplace has brought about the development of a number of health concerns majority related to eyes which prompted us to carry out this study to find out the factors relating to eye and vision problems associated with computer work and recommendations for preventing or reducing their developments.

Methods: This was a cross-sectional study, which was carried out amongst employees of Rama University, Mandhana, Kanpur, India. The data was collected between June 2016 and October 2016. A total of 214 individuals gave their consent and participated in the study. A pretested, semi-structured questionnaire was used to collect the data.

Results: 214 personnel were interviewed. Mean age of study subjects was 33.5 ± 11.013 years with 58.88% of subjects being in the age group of 25-35 years. 49 (22.9%) reported spending 2-3 hours 118 (54.83%) spent 3-6 hour/day, while 47 (22%) of the respondents spent more than 6 hour/day working on a computer. Prevalence of dry eye was found to be 75% (160/214). The common symptoms were watery eyes (31.77%), followed by sensitivity to light & blurring of vision (both 17.76%), sensation of having something in the eyes (14.95%), difficulty in night time driving (13.08%), eye redness (11.21%) and difficulty in wearing contact lenses (5.6%).

Conclusions: Three fourth of the computer professionals we studied had mentioned to have some computer-related health problems. This is a significant proportion and denotes that the occupational health of the people working in the computer field should be emphasized as a field of concern in public health. The ergonomics of the working environment of the computer professionals have a direct impact on their wellbeing. Hence the organizations employing them, as well as the professionals themselves need to be sensitized regarding the importance of the regular eye & health check-ups and proper working conditions.

Keywords: Dry eye, Ocular problems, Vision related problems

INTRODUCTION

Dry eye is a disorder of the tear film which occurs due to tear deficiency or excessive tear evaporation; it causes damage to the interpapillary ocular surface and is associated with a variety of symptoms reflecting ocular discomfort.¹ The term dry-eye syndrome according to DEWS has been defined as “a multifactorial disease of

the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear-film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface”. Dry eye refers to disorders of the tear film due to reduced tear production and/or excessive tear evaporation associated with symptoms of ocular discomfort.³

The increased use of computers in the workplace has brought about the development of a number of health concerns. Many individuals who work at a computer report a high level of job-related complaints and symptoms. People with dry eye often complain of pain, foreign body sensation, redness etc. Because the tear film in dry eye patients is unstable and incapable of maintaining the protective qualities that are necessary for its structure and function, patients experience the symptoms of discomfort associated with dry eye, which are burning, stinging, grittiness, foreign body sensation, tearing, ocular fatigue, and dryness. Patients may complain of symptoms of dry eye in the presence or absence of signs of the disease.⁴

This study will review the factors relating to eye and vision problems associated with computer work and provide recommendations for preventing or reducing their development.

METHODS

This was a Cross-sectional study, which was carried out amongst employees of Rama University, Mandhana, Kanpur, India. The data was collected between June 2016 and October 2016. A total of 214 individuals gave their consent and participated in the study. A pretested, semi-structured questionnaire was used to collect the data.

Inclusion criteria

Inclusion criteria were employee of Rama university and its affiliated colleges; working within Mandhana campus;

average usage of computer for minimum of 2 hours daily; history of computer usage above 5 years.

Exclusion criteria

Exclusion criteria were employee working outside Mandhana campus; not willing to participate; individual not present during the interview; using computer less than 2 hours daily.

After obtaining verbal and informed written consent, subjects were given self-administered questionnaire and the data was collected. All the employees of Rama University and its affiliated colleges located within Mandhana campus, who met the inclusion criteria had been included in the study. Employees who didn't meet the criteria were excluded from this study. The collected data was analyzed by using SPSS software (Trial Version) 23.0.

RESULTS

The present study included 214 personnel. The male: female ratio was 5:3 among the respondents. Mean age of study subjects was 33.5 ± 11.013 years with 58.88% of subjects being in the age group of 25-35 years (Table 1). Regarding hours at work spent in front of a computer, 49 (22.9%) reported spending 2-3 hours 118 (54.83%) spent 3-6 hour/day, while 47 (22%) of the respondents spent more than 6 h/day working on a computer. Mean duration was found to be 4.75 ± 2.34 hours (Table 2).

Table 1: Age wise distribution of respondents.

Age group (years)	Male	Female	Total (%)
<25	16	18	34 (15.89)
25-35	80	46	126 (58.88)
36-45	18	8	26 (12.15)
46-55	12	4	16 (7.47)
56-65	4	2	6 (2.8)
>65	4	2	6 (2.8)
Total	134 (62.6%)	80 (37.4%)	214 (100)
Mean age	33.5±11.013 years		

Table 2: Respondents using computer on daily basis (in hours).

	>2 -<3 hours	>3 -<4 hours	>4 -<6 hours	>6 -<8 hours	>8 hours	Total
RMC	18 (23.68%)	10 (13.16%)	22 (28.95%)	20 (26.31%)	6 (7.89%)	76 (35.5%)
RIET	18 (21.95%)	30 (36.58%)	20 (24.39%)	16 (19.51%)	0 (0%)	82 (38.3%)
RCN	8 (25%)	18 (56.25%)	6 (18.75%)	0 (0%)	0 (0%)	32 (14.95%)
RCCM	3 (30%)	5 (50%)	2 (20%)	0 (0%)	0 (0%)	10 (4.67%)
University office	2 (14.28%)	1 (7.14%)	6 (42.85%)	1 (7.14%)	4 (28.57%)	14 (6.54%)
Total	49 (22.9%)	64 (29.6%)	54 (25.23%)	37 (17.3%)	10 (4.7%)	214 (100%)
Mean duration	4.75±2.34 hours					

Table 3: Distribution of symptoms of dry eye amongst the respondents.

	Sensitivity to light	Eye redness	Sensation of having something in your eyes	Difficulty in wearing contact lenses	Difficulty in night-time driving	Watery eyes	Blurred vision or eye fatigue	No symptoms
Total	38 (17.76%)	24 (11.21%)	32 (14.95%)	12 (5.6%)	28 (13.08%)	68 (31.77%)	38 (17.76%)	54 (25.23%)
χ^2 test	$\chi^2=0.0022$ (p=0.9626)

Figure 1: Various symptoms of dry eye faced by the respondents.

The prevalence of dry eye was found in the study group was 75% (160/214). The subjects were asked about the various symptoms of dry eye experienced by them. The results are shown in (Table 3). The common symptoms were watery eyes (31.77%), followed by sensitivity to light & blurring of vision (both 17.76%), sensation of having something in the eyes (14.95%), difficulty in night time driving (13.08%), eye redness (11.21%) and difficulty in wearing contact lenses (5.6%).

DISCUSSION

In our study, we found that 62.6% [n =214] (134/214) respondents were male and 37.4% (80/214) were female whereas Bhandari et al in his study found that 66% of the respondents in his study were male and 34% were female, which was similar to our study.⁵ However, 66% of his study subjects were below the age group of 25 years and mean age was found to be 25.04, whereas, in our study, we found that 55.88% belongs to 25-35% age group and the mean age was found to be 33.5±11.013 years, which was not similar to our study.⁵ In a similar study by Arumurgam, he found that mean duration of daily computer usage was 4.27±2.78 hours, whereas, in our study, we found mean duration of daily usage of computer to be 4.75±2.34 hours, which was similar to our study.⁶ In another study by Reddy et al found that 89.9% of students had one or more symptoms of dry eye, whereas, in our study we found that 75% of the

respondents had one or more symptoms of dry eye.⁷ These findings were nearly similar to our study. In another study by Ranjan et al, it was found that 23% had watering of eye, 25.4% had gritty sensation and 17.8% had red eye, whereas, in our study, we found that 37.77% had watery eyes, 14.95% had sensation of having something in the eyes and 11.21% had eye redness. These findings were similar to our study.⁸

We studied dry eye prevalence amongst employees in Kanpur. Three-fourths of the respondents had dry eye. Magnitude of visual problems was found to be directly related to average computer hours per day.

CONCLUSION

In conclusion, three fourth of the computer professionals we studied had mentioned to have some computer-related health problems. This is a significant proportion and denotes that the occupational health of the people working in the computer field should be emphasized as a field of concern in public health. The ergonomics of the working environment of the computer professionals have a direct impact on their wellbeing. Hence the organizations employing them, as well as the professionals themselves need to be sensitized regarding the importance of the regular eye & health check-ups and proper working conditions.

We strongly recommend that the following steps to be taken to reduce the occurrence and prevention of dry eye and eye related problems.

1. Since India is getting digitalized, dry eye is going to be the major side effects of it. So, special instructions/guidelines should be issued by the Government for its prevention.
2. Law/legislation can be framed to safeguard the computer users from dry eye at work place and enforce its preventive measures.
3. Media should take a pro-active role to create awareness among people about dry eye, its symptoms and its preventive measures.
4. Proper lighting in the room. Adjust lights to reduce glare on the computer screen. The monitor should not face any opened window to avoid glare on the screen. Use glare filters to reduce the glare on the monitor. Adequate illumination of room and avoiding working in the dark.

5. Use flicker free monitor (LCD/LED). Monitor should always be five to nine inches below the eye level. The screen should be about a hand's distance from your eyes. Move your computer monitor away from the window. Adjust the brightness and contrast based on your comfort. Increase the font size of the text.
6. Correct sitting posture is very necessary to prevent people from having neck or back pain while working on computer.

Despite the limitations of this research, the results would serve as a knowledge base on which to build strategies for improving computer vision syndrome knowledge. The results would be useful for policy makers, programme planners and eye care practitioners. However, further research of this nature about dry eye should be conducted in computer-using institutions in other parts of India and then amongst the population at large.

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