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FREQUENCY OF OPTIC IMAGE SYNDROME AND ITS CONSEQUENCES ON VISUALIZATION ACUITY



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Abstract

Globally, computer has become one of the general office utensils used in numerous establishments. Using of a computer for prolonged time heads users towards wider danger of computer vision syndrome (CVS). It is the prominent job-related health trouble of present time. Almost 70 percent of people using computer are suffering from CVS. Moreover health problems related to CVS are reasons for incompetence at place of work worsens the attribute of work. Studies on troubles of CVS and hazard factors associated with it are not conducted in Quetta city of Pakistan. Present research based on a cross-sectional study for the assessment of occurrence of CVS and factors linked with it amongst computer users and working employees in Quetta, Pakistan. Multistage random sampling method was adopted to choose 215 study partakers, and data were collected using structured questionnaire. By self-reported method, CVS was determined and analyses were executed by use of version 20 of SPSS. Out of 215 subjects the prevalence of CVS was 76.6% (n=118) in males and 88.6% (n=54) in females. Headache was 47.4% in males and 60.7% in females, blurred distant vision was 44.2% in males and 57.4 in females. Blurred near vision was 41.6% in males and 57.4% in females and sore or tired eyes was 40.3% in males and 55.7% in females were the frequent described signs of CVS. Yet, the users of computer who grabbed consistent health breaks and with the adequate knowledge on computer protective procedures were less influenced by CVS. The frequency of CVS was established to be greater in Quetta, Pakistan. Knowledge, regular health breaks, daily computer usage were interpreter attributes for CVS. Minimizing disclosure time, enlightening alertness on safety protocols, and by the managements help to confront CVS.

Keywords: Computer vision syndrome, Health education,

INTRODUCTION

Computer Vision Syndrome (CVS) is demarcated by the American Optometric Association as a compound of vision and eye problems associated with the events which upset the near vision and which are faced in during or connection to the use of computers.

It comprises a collection of visual indications, appears from the prolonged watching of digital screens when the requirement of the assignment surpass capabilities of



spectator. Indications of CVS who are stated to as digital eye strain comprise, light/glare sensitivity, fatigue/eye strain , double vision, irritated and dry eyes, headache, red eyes, blurred vision, burning of eyes, lateness in changing focus, excessive tearing and changes in perception of color (1).

Given the little application and accessibility of personal protective equipment's (PPEs), , and the inadequate break time and the high workload whilst using computer in emerging nations the load of CVS is extraordinary (2).

The load of CVS on public health is flattering fear of policy makers and draws researcher's consideration. In Quetta city, a study piloted in, described that 40% of computer users involved of various organizations have underwent from not less than one indication of CVS (3). Duration of use of computer, vision problems, screen brightness, glare, poor lighting and unsuitable workplace arrangement are threatening reasons of CVS (3).

While numerous studies have stated the commonness of CVS and the risk aspects such as elongated use of computer and poor postures at workplaces, many of which were concentrated on adult study subjects of West (4).

Over the previous 30 years, there has been excessive progress in technology of computer. Almost it has been converted into an obligatory part of utensils at home and office. It is definite that computer has affectedly profited society and marks the working conditions relaxed and fabricating rapid productivity (4).

Thus, the aim of current study was to evaluate commonness of CVS and linked reasons amongst computer users of the office workers in Quetta, Pakistan. This study elaborates the hostile consequences of the usage of computer and its avoidance and the regulated procedures amongst users of computers in offices in Quetta, Balochistan.

MATERIAL AND METHODS

STUDY DESIGN AND AREA OF STUDY

Study was designed as cross-sectional and conducted in Quetta, Pakistan.

SOURCE AND STUDY POPULATION

Those users of computer, who were working in different managements were the subject population, while all those subjects who were for at least one year, using computer in their everyday working life were taken as study subjects

SAMPLE SIZE

A sample size of 215 respondents was determined.

SAMPLING PROCEDURE

DATA COLLECTION METHOD

A self-administered questionnaire was accompanied by observational checklists was utilized to gather computer usage details, symptoms of CVS, socio demographic data and the computer user's awareness on protective procedures of CVS. Data collection process was monitored by supervisors.

DATA PROCESSING AND ANALYSIS

The data were processed and analyzed by SPSS, version 20.0.

ETHICAL PERMISSION

Ethical permission was acquired from CASVAB ethical committee. Study purpose was noticeably clarified to the subjects of study and verbal consent attained. Concealment of the data retained at every level of study.

RESULTS AND DISCUSSION

In present study we had 215 subjects, out of which 154 (71.61%) were male and 61 (28.4%) were female. Their age ranged between 18 to 50 years with mean age 32.36 ± 6.94 , their demographic variables and duration of computer use are given in Table I and Table II respectively.

Table I. Anthropometry Variables of CVS

	Total (n=215)	Female (n=61) 28.4%		Male (n=154) 71.6%	
		Mean	±SD	Mean	±SD
Age (years)	32.36±6.944	39.16	6.48	29.66	5.018
Weight (kg)	70.88±15.46315	85.52	15.83	65.0909	10.81
Height (inches)	56.2884±8.26266	64.5	5.42	53.04	6.82
BMI (Kg/m ²)	35.73±8.345	31.71	5.3	37.32	8.79
Waist circumference	35.8744±4.85375	39.77	4.29	34.33	4.16
SBP	123.05±14.147	131.64	16.25	119.64	11.63
DBP	80.98±9.642	86.72	8.9	78.7	8.98

* Physical status of subjects

Table II. Computer Usage duration and physical variables

Computer or Laptop Usage				
	Frequency	Percent	Frequency	Percent
Computer	98	63.6	49	80.3
Laptop	56	36.4	12	19.7
Marital Status				
	Frequency	Percent	Frequency	Percent
Single	98	63.6	10	16.4
Married	55	35.7	44	72.1
Other	1	0.6	7	11.5
Physical Activity				
	Frequency	Percent	Frequency	Percent
Yes	39	25.3	9	14.8
No	115	74.7	52	85.2
Body Mass Index (BMI)				
	Frequency	Percent	Frequency	Percent
≤25 Kg/m ²	12	7.8	5	8.2
≥25 Kg/m ²	142	92.2	56	91.8

* Different frequencies of CVS subjects

Whereas Table III displays occurrences of several signs such as blurred vision, headache, redness of eyes, tired eyes, watering of eyes in suffering subjects of CVS. The utmost communal sign was headache i.e. in n=73 (47.4%) of study subjects, this trailed by tiredness of eyes in n=67 (45%). Tiniest joint sign was double vision n=28 (18.2%) males and n=17 (27.9%) females.

Table III. Prevalence of Computer Vision Syndrome Symptoms: Frequency and percentage of ocular symptoms of computer vision syndrome parameters of the study respondents

Male					Female				
Headaches					Dry watery eyes				
	Frequency	Percent	Frequency	Percent		Frequency	Percent	Frequency	Percent
Mild	36	23.4%	7	11.5%	Mild	71	46.1%	19	31.1%
Moderate	45	29.2%	17	27.9%	Moderate	25	16.2%	12	19.7%
Severe	73	47.4%	37	60.7%	Sever	58	37.7%	30	49.2%
Sore or tired eyes					Burning Red eyes				
Mild	52	33.8%	11	18.0%	Mild	79	51.3%	23	37.7%
Moderate	40	26.0%	16	26.2%	Moderate	22	14.3%	10	16.4%
Severe	62	40.3%	34	55.7%	Severe	53	34.4%	28	45.9%
Blurred Near vision					Double vision				
Mild	51	33.1%	13	21.3%	Mild	104	67.5%	34	55.7%
Moderate	39	25.3%	13	21.3%	Moderate	22	14.3%	10	16.4%
Severe	64	41.6%	35	57.4%	Sever	28	18.2%	17	27.9%
Glare Sensitivity					Neck shoulder pain				
Mild	51	33.1%	10	16.4%	Mild	25	16.2%	5	8.2%
Moderate	39	25.3%	21	34.4%	Moderate	45	29.2%	19	31.1%
Severe	64	41.6%	30	49.2%	Sever	84	54.5%	37	60.7%
Blurred Distant Vision					Back Pain				
Mild	68	44.2%	19	31.1%	Mild	31	20.1%	5	8.2%
Moderate	18	11.7%	7	11.5%	Moderate	45	29.2%	18	29.5%
Severe	68	44.2%	35	57.4%	Sever	78	50.6%	38	62.3%
Observing 20-20-20 Rule					Effects on life style				
Yes	28	18.2%	13	21.3%	Yes	119	77.3%	49	80.3%
No	126	81.8%	48	78.7%	No	35	22.7%	12	19.7%

Table IV. Association of various factors with the occurrence of CVS

Chi square	Marital				Physical				
	Age	Gender	Qualification	Status	Tea	Tobacco	Activity	BMI	BP
Headache	0.957	0.099	0.119	0.518	0.029	0	0.025	0.554	0.842
Sore or Tired eyes	0.905	0.049	0.311	0.453	0.036	0	0.002	0.224	0.116
Blurred Near Vision	0.202	0.095	0.141	0.143	0.094	0	0.036	0.996	0.01
Glare Sensitivity	0.101	0.045	0.135	0.188	0.007	0.003	0.018	0.134	0.072
Blurred Distant Vision	0.231	0.181	0.027	0.013	0.024	0.011	0	0.272	0
Dry Watery Eyes	0.29	0.132	0.1	0.052	0.02	0.031	0.002	0.804	0.169
Burning Eyes	0.518	0.219	0.007	0.05	0.396	0.327	0.177	0.621	0.578
Back Pain	0.956	0.09	0.263	0.553	0.038	0.002	0.101	0.524	0.939
Neck Shoulder Pain	0.695	0.306	0.463	0.592	0.012	0	0.062	0.142	0.802
Double Vision	0.233	0.186	0.055	0.045	0.033	0.072	0.022	0.2	0.185

Pearson Chi Square analysis performed with different parameter of the study and found significance in parameters. Gender is significant with headache, tired eyes, glare sensitivity and back pain. Qualification is significant with blurred distant vision and double vision.

Marital status is significant with blurred distant vision, dry watery eyes and double vision. Tea is significant with headache, sore or tired eyes, blurred distant vision, back

pain, neck and shoulder pain and double vision. Physical activity is significant with headache, blurred near vision and double vision.

These days, modern style of life gratified the entire world to switch to the up-to-date equipment where triumph of such life course is digital screens. The U.S. National Institute of Occupational Safety and Health (NIOSH) demarcated CVS as “eye strain associated with prolonged computer use”, and the American Optometric Association (AOA) extended this definition to “eye and vision –related problems related to near work which are experienced during or related to computer use”.

In our study we had a total of 215 respondents who filled the questionnaire. Large part of the study subjects were males (71.6%), subsequently the data were randomly gathered from different offices of Quetta city. In the offices of aforesaid metropolitan city, maximum of the workers are still males because of cultural tendency of our society. Toama *et al.*, (5) in their investigation listed that the females study subjects percentage was more with CVS as compared to males study subjects. Mean age of the subjects was 32.36 ± 6.94 . A study by Erum Shahid *et al.*, (6) described CVS to be 75%. Another study conducted in Islamabad, described only 25% CVS in students and workers of offices (7). Rise in occurrence of CVS in the present study might be because of the subjects working in offices comparing the students and with rise in the mean of age of study subjects. Study conducted in Malaysia revealed 63% CVS (8) while other study (9) from Nepal reported 89.9% subjects with CVS. First one involved the office workers while the second one involved children of aged below 10 years with huge sample size. In the students of university in Chennai, CVS occurrence was found to be 69.3% (10) while 75% reported by Klammer (11). The commonness of CVS differs from venue to venue but the every study agrees on the point is a person who elongated works on the computer, he experiences more complaints of visual discomfort (7-11). The asthenopic symptoms illustrated by Sheedy *et al* (12) contained soreness of eyes, eye strain, discomfort, eye tiredness, blurring, aching, burning, diplopia, irritation, watering, pain, foreign body sensation, photophobia, itching and dryness. Even so they can be widely allocated in two groups (13). One group of these is called exterior indications; are allied to dryness of eyes and involved watering, burning, dryness of eyes and irritation. The other group labeled inner indications, are because of accommodative anomalies, vengeance and refractive. This contains blurring of vision, headache, eye ache, eye strain and diplopia. Asthenopic symptoms were common in our subjects which were tired eyes in males 40.3% and in females 55.7%, burning 34.3% in males and 45.9% in females. Sen *et al.*, (14) reported 46% of subjects with redness of eyes, 55% with burning sensation in eyes and 87% subjects with eye fatigue (8). While Talwar *et al.*, (15) observed 40% cases of redness. Reasons are less blinking rate of eyes, advancing age and staring the monitor for long duration.

An individual suffering from blurred vision at nearby or viewing distant after prolonged work on computer is utmost common indication linked to CVS. It is because of an inaccurate accommodative retort while working at computers or failure to ease accommodation fully after the near-vision strain. Indicators of patients are generally linked to close vision events and incorrect accommodative reactions. Over or Under accommodation in association to seeing object are source of asthenopia (16).

In current study out of 154 male subjects, 73 (47.4%) male participants complained of severe headache while 45 (29.2%) males complained of moderate headache and 36 (23.4%) male participants complained of mild headache. Whereas, out of 61 female subjects, 37 (60.7%) female participants complained of severe headache while 17 (27.9%)

female participants complained of moderate and 7 (11.5%) female participants complained of mild headache.

Another study reported the headache in 46% subjects and blurred vision in 13.2% subjects (15). Other factors considered as reason of CVS are: inappropriate viewing distances from the screen, dimly lit up atmospheres, uncorrected or over corrected refractive errors, stare on the computer display, bad postures and might be the combination of these reasons (17). CVS can be handled sufficiently with support of an ophthalmologist and altering the environment of work place (18, 19). By a visit to an ophthalmologist, dry eye and correction of refractive error can be handled easily. 20/20/20 rule should be followed to take rest breaks. This rule expresses that after the viewing of screen of computer for every 20 minutes, the computer user should redirect avert remote at a range of 20 feet and retain aimed for 20 seconds for refocus of eyes. An alternate proposal by The American optometric association is interval after every 2 hours of uninterrupted computer work for 15 minutes. Luckily the use of computer doesn't root any lasting destruction but momentary distress decreases the competence and thus ultimately decreases the output of an individual (20, 21). Additional evidence could have been regained if the number of males and females were equal workers of office were examined. More readings should be executed about ocular analyses of people agonized from computer vision syndrome.

CONCLUSION

The present study elaborated that occurrence of CVS was significantly higher in computer users in Quetta, Pakistan. Lack of knowledge and daily exposure time were greatest contributing factors to cause CVS. Therefore, minimizing the time of exposure and enlightening the alertness of users by support of management, serious training is significant to address the hindrance. In the future, it is highly suggested to control the synergistic or additive effects of using computers, tablets and smart phones on CVS off or on the working time.

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