Assessment of stress by general health questionnaire-12 among computer engineering students and teaching staff of Gulbarga city

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Abstract

Background: Private bodies, autonomous institutions and almost every organization are being computerized for smooth and faster flow of data and information. Computers are easily accessible even to middle class family. The application of computer technology and the accompanying use of VDT's are revolutionizing the work places in India. Computer work has generated a new genre of occupational health problems namely stress, computer vision syndrome and musculoskeletal problems etc.

Methods: A cross sectional study was conducted among 319 third year computer engineering students and 79 teaching staff in all 4 Engineering colleges of Gulbarga city for 1year from January 2011 to December 2011. The study subjects were interviewed using pre-designed and pretested proforma including General Health questionnaire-12.

Results: In our study majority (75.37%) of study subjects belonged to 20-22 years age studying B.E Computer science and 274(68.84%) were females and 124(31.15%) were males. The study shows that majority of the study subjects 241(60.55%) had no distress with score 0-12,   141(35.42%) had mild distress with score 13-24 and 16(4.02%) had moderate to severe distress (Male-4.03% , Females-4.01%) with score 25-36.

Conclusion: The study found that moderate-severe distress more common in students working on computers for 6-9hr which accumulate over a period of time resulting in debilitating injuries and can be prevented by multidisciplinary approach.

Keywords: stress, computer related health problems, GHQ-12, engineering students.

Introduction

Many universities or job require a computer literate for enrollment. As increasing number of young people are using Information and Communication Technology (ICT) for education, work and leisure activities. Computer work has generated a new genre of occupational health problems namely stress, computer vision syndrome and musculoskeletal problems etc [1]. Computer related stress and anxiety may have profound effects on an individual's well being. Stress may lead to habits or behavior that might impair health. If the source of stress cannot be removed it will lead to chronic stress. Chronic stress is defined as a "state of prolonged tension from internal or external stressors, which may cause various physical manifestations – e.g., asthma, back pain, arrhythmias, fatigue, headaches, hypertension, irritable bowel syndrome, ulcers and suppress the immune system" [2]. It can raise blood pressure, increase the risk of heart attack and stroke, increase vulnerability to anxiety and depression, contribute to infertility and hasten the aging process [2]. Escapist eating, drinking alcohol or the use of other drugs such as tobacco, tranquillizers, sleeping pills or analgesics etc may therefore reduce the negative impact of stress. Involuntary reactions may be equally damaging in the long term; for ex:- disturbed sleep pattern or appetite ultimately evolve

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into habit or life styles that are risk factors for certain kinds of diseases (such as coronary heart disease) [3].

Many studies on computer users have demonstrated the relation between work place factors, the use of computer and work related stress, musculoskeletal disorders and visual problems etc. Its occupational environment holds a threat of opening or aggravating a basket of computer related health problems, if needed preventive steps are not taken. The high prevalence of computer related health problems namely stress reported by graduate students suggests a public health need to identify interventions that will reduce symptom severity and prevent impairment. Hence a need was felt to carry out the present study to assess the stress by GHQ-12 among computer science staff and students, who are budding engineers of our society.

Objective:

1. To find the prevalence of stress among computer engineering students and teaching staff in Gulbarga city.

2. To suggest remedial measures for prevention of stress among study subjects.

Methodology:

A cross sectional study was conducted among computer engineering students and teaching staff in all 4 Engineering colleges of Gulbarga city for 1 year from January 2011 to December 2011.

Inclusion criteria:

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 in the study [1]. After consulting with the head of department of computer science department of Engineering colleges; teaching staff and third year computer engineering students are included in the study.

Exclusion criteria:

1. Computer engineering students belonging to first, second and final year.
2. Students belonging to other departments of engineering colleges.

Sample size

In Gulbarga city, there are four engineering colleges. All the third year (319) students and 79 teaching staff of computer science department belonging to these four engineering colleges are included in the study.

Table 1. Distribution of study population according to socio-demographic factors

Socio-demographic factors	MALE		FEMALE		TOTAL	
	No.	%	No.	%	No.	%
Age in years						
20-22	89	71.77	211	77	300	75.37
22-23	20	16.12	18	6.56	38	9.54
=24	15	12.09	45	16.42	60	15.07
Total	**124**	**100**	**274**	**100**	**398**	**100**
Marital status						
Married	15	12	30	11	45	11
Unmarried	109	88	244	89	353	89
Total	**124**	**100**	**274**	**100**	**398**	**100**
Religion						
Hindu	93	75	186	67.9	279	70.1
Muslim	29	23.38	83	30	112	28.14
Christian	1	0.8	4	1.5	5	1.23
Others	1	0.8	1	0.4	2	0.50
Total	**124**	**100**	**274**	**100**	**398**	**100**
Education						
Student	104	83.87	215	78.46	319	80.15
Graduate	13	10.48	28	10.21	41	10.3
Postgraduate	7	5.6	28	10.21	35	8.7
Doctorate	0	0	3	1.09	3	0.75
Total	**124**	**100**	**274**	**100**	**398**	**100**
Occupation						
Student	104	83.9	215	78.5	319	80.15
Staff	20	16	59	21.5	79	19.85
Total	**124**	**100**	**274**	**100**	**398**	**100**
Socio-economic status						
I	0	0	11	4.01	11	2.76
II	23	18.54	66	24.08	89	22.36
III	76	61.3	139	50.72	215	54
IV	25	20.16	58	21.16	83	20.88
V	0	0	0	0	0	0
Total	**124**	**100**	**274**	**100**	**398**	**100**

Table 2. Distribution of the study subjects according to the duration of working on computers in a typical day

Duration	Male		Female		Total	
	No.	%	No.	%	No.	%
<3hr	41	33.1	76	27.73	117	29.4
3-6hr	48	38.8	116	42.33	164	41.2
6-9hr	31	25	44	16.05	75	18.84
>9hr	4	3.23	38	13.86	42	10.55
Total	124	100	274	100	398	100

Table 3. Distribution of the study subjects according to the duration of using computers (in years)

Duration	Male		Female		Total	
	No.	%	No.	%	No.	%
<3yr	38	30.6	63	22.99	101	25.37
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 4. Distribution of the study subjects according to the General Health Questionnaire-12

GHQ score	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal(0-12)	87	70.16	154	56.2	241	60.55
Mild distress(13-24)	32	25.8	109	39.7	141	35.42
Moderate to severe distress (25-36)	5	4.03	11	4.01	16	4.02
Total	124	100	274	100	398	100

Table 5. Association between General Health Questionnaire and duration of work on computers

| GHQ-12 | Duration of work on computers | | | | | | | | | | | | | | | | | | | |
| | <3yr | | | | 3-6yr | | | | 6-9yr | | | | >9yr | | | | TOTAL | | | |
	<3hr	3-6hr	6-9hr	>9hr	<3hr	3-6hr	6-9hr	>9hr	<3hr	3-6hr	6-9hr	>9hr	<3hr	3-6hr	6-9hr	>9hr	<3HR	3-6HR	6-9HR	>9HR
Normal	24	21	0	8	29	58	21	14	5	19	4	3	6	11	14	4	64	109	39	29
%	5.9	5.3	0	1.87	7.28	14.57	5.31	3.4	1.26	4.77	0.93	1.25	1.5	2.82	3.43	0.93	16.08	27.38	9.68	7.5
Mild distress	18	20	6	2	24	22	15	8	8	2	2	0	3	6	4	1	53	50	27	11
%	4.37	5	1.56	0.625	5.94	5.63	3.75	1.88	1.88	0.63	0.63	0	0.63	1.57	0.93	0.25	13.31	12.56	6.88	2.9
Moderate to severe distress	0	2	0	0	0	2	2	0	0	1	1	1	0	0	6	1	0	5	9	2
%	0	0.5	0	0	0	0.5	0.5	0	0	0.25	0.25	0.25	0	0	1.5	0.25	0	1.25	2.26	0.5
χ^2-Value	12.99				8.58				16.41				8.26				26.00			
P-value	P<0.05				P>0.05				P<0.05				P>0.05				P<0.001			

Study tool:

The study subjects were interviewed using pre-designed and pretested proforma including General Health questionnaire-12. 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 etc. General health questionnaire (GHQ-12): The General Health Questionnaire is a screening device for identifying minor psychiatric disorder [4]. It was developed by Goldberg who described the measure as a psychological well-being measure. The rating scale is a behaviorally anchored scale with four options; Better than usual, Same as usual, Worse than usual, and Much worse than usual. A Likert style scoring procedure was used on a four point scale with Better than usual representing 1 point and Much worse than usual representing 4, with high scores equating to poor health [5]. It can be applied to all age groups except children. It can be used with the general population or with patients in any sort of non-psychiatric clinical or primary care settings and used by researchers and clinicians [4].

GHQ-12	SCORE
Normal	0-12
Mild distress	13-24
Moderate to severe distress	25-36

Pilot Study: A pilot study was done in 25 study subjects in the study population.

Results and Discussion
Socio-demographic factors.

In our study majority (75.37%)   of study subjects belonged to 20-22 years age studying B.E Computer science and 274(68.84%) were females and 124(31.15%) were males and in study done by Eric B. Schlossberg et al [6] (2004) in 206 Electrical Engineering and computer science graduate students of the University of California at Berkeley in whom majority (85%) belongs to 21-25yr age group and (85%) were males and study done by Sen A and Stanley Richardson[7] (2007) in Malaysia among 136 under graduate students (studying computing or medicine) revealed that 71% of the respondents were less than 30 years old and 65% of them were females.

The study revealed that 319 (80.15%) of the study subjects were studying B.E, followed by 41 (10.3%) graduates, 35(8.7%) postgraduates and 3 (0.75%) doctorate. This study was done among students and teaching staff in contrast to study done by Husnun Amalia et al [8] in 2010 among 99 (100%) are computer science students of university of Indonesia and Cammie Chaumont Menéndez et al [9] in their study done in 2009 in USA revealed that 160(100%) are engineering graduate students.

Duration of using computers

The present study reported that majority of the study subjects 164(41.2%) used computers for 3-6 hour followed by 117(29.4%) less than 3hour, 75(18.84%) for 6-9 hour and 42(10.55%) for more than 9 hr. Since in this study the study subjects have got practical classes for 3hr in a day hence majority (41.2%) of them work on computers for 3-6hr.

Richa Talwar et al [1] (2009) in their study on computer professionals in Delhi reported that 88(44%) individuals worked in front of computers for 6-9hours followed by 60(30%) for 3-6hours and 52(26%) for more than 9 hours per day.

A study done by Che-hsu (Joe) Chang PT et al [10] (2007) in USA among undergraduate students, reported that daily computer usage longer than 3 hr was significantly associated with an odds ratio 1.50 (1.01–2.25) of reporting symptoms.

A K Sharma et al[11] (2006) in their study on IT professionals with varied job profiles in New Delhi revealed that average working hours per day on computer in call center and software development were higher i.e. 9 ± 0.67 hours and 8.3 ± 0.81 hours respectively as compared to 5 ± 0.41 hours in data entry/ processing group.

Our study 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 which is similar to study done by A K Sharma et al [11] (2006) on IT professionals with varied job profiles in New Delhi where in majority 72(36%) worked on computers for 3-6years followed by 35(17.5%) for 6-9 years,

31(15.5%) for <3years, 28(14%) for 12-15years, 27 (13.5%) for 9-12 years and 7(3.5%) for >15years.

Study subjects according to the General Health Questionnaire-12:

This study shows that majority of the study subjects 241(60.55%) had no distress (Male-70.16%, Female-56.2%) with score 0-12, 141(35.42%) had mild distress (Male-25.8%, Female-39.7%) with score 13-24 and 16(4.02%) had moderate to severe distress (Male-4.03%, Females-4.01%) with score 25-36.

The present study revealed that 35.42% had mild distress and 4.02% moderate to severe distress which was similar (35%) to study done by A K Sharma et al[11] (2006) on IT professionals with varied job profiles in New Delhi and in contrast to study done by *Q.A.S. Akrouf et al [12] (2010) in* 750 bank office workers in Kuwait were that the mean score on the GHQ12 was "upper normal" [11.5 (SD 5.4)] and only a minority (2.0%) were having moderate to severe psychological distress (score 25–36).

Association between General Health Questionnaire and duration of work on computers:

This study reveals that mild distress is more common among study subjects, who work on computers for <3hr 53(13.31%), followed by 50(12.56%) for 3-6hr, 27(6.88%) for 6-9hr and 11(2.9%) for >9hr while moderate-severe distress was more common in who work on computers for 6-9hr 9(2.26%), 5(1.25%) for 3-6hr, 2(0.5%) for >9hr and absent among those , who work <3hr. This is found to be statistically highly significant. ($\chi^2 = 26$, p<0.001). After suffering from mild distress study subjects reduced their duration of work on computer to <3hr. Therefore it is more common in this group.

Conclusion

In our study majority of the study subjects used computers daily for 3-6 hours continuously for 3-6years. Moderate-severe distress more common in students working on computers for 6-9hr causing similar symptoms as reported by employees using computers which accumulate over a period of time resulting in debilitating injuries causing absenteeism and poor classroom performance which can be prevented by multidisciplinary approach such as creating a safer, more comfortable, healthful and efficient work environment for the students.

Limitation:
Stress being subjective was difficult to measure.

Recommendations:
· To combat stress they need to consider relaxation measures like meditation, proper rest, good sleep and timely food intake.
· Studies to establish the cause and effect relationship between physical and mental health of the students and teaching staff working on computers need to be taken up in a large way.

Acknowledgement:

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