A Co-relational study to identify prevalence of computer related health hazards and its relationship with selected factors among computer professionals of selected IT firms of Kolkata, West Bengal

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ABSTRACT

Background- Millions of people around the world now use computers as their primary business tool. In the last decade or so, the number of hours people use computers has increased tremendously. With this increase in the use of computers, problems have also increased. Computer related health problems are caused by improper use and lack of knowledge about “Safe computing techniques”. The ever increasing use of computers in various fields has led to rise in musculoskeletal problems related to its operation. Apart from ergonomic design factors, number of psychosocial workplace factors have emerged that may influence the biomechanical load or the reactions to workplace stress. So the purpose of the study was to assess the magnitude of problems related to computer use related health hazards.

Methods- A total of 100 IT professionals were included as study subjects. The Conceptual Framework of the study was based on Rosenstock’s (1974) and Becker and Maiman’s (1975) Health Belief Model. Non Probability Purposive sampling technique was used. Structured knowledge questionnaire under the sub headings of physiological, psychological and work related factors were used to collect data. Content validity and reliability of the tool was established.

Result- No significant correlation was found between computer use related factors and health hazards. Significant association was found between the marital status of the respondents and their anxiety, stress and depression score at chi value of 5.8992*, 4.2087* and 3.896* respectively which was significant at 0.05 level at df-98.

Conclusion- The recommendations are offered that study can be replicated on larger sample as the findings cannot be broadly generalized as it was conducted only in one IT firm and was confined to small numbers of computer professional.

Keywords- Computer use related health hazards, Work related factors of computer related health hazards, Computer professionals

INTRODUCTION-
We all thought technology would make our lives easier. Today, we are overwhelmed by computers and have perhaps begun to look at it as somewhat of an “Everything appliance”, the one thing that with every passing day, seems to be able to do anything and everything. But set aside the pleasures that we enjoy, we see the big bad demon it can be. The ill–effects of the computer
are grossly underrated. They harm us physically, emotionally, mentally and burn a hole in our pockets too, with telephone bills and internet hours. Our wrists ache, our eyes tear, our necks cramp, and we know that the machine in front of us is responsible. Still, we submit ourselves to our beloved computers. The ever increasing use of computers in various fields has led to rise in musculoskeletal problems related to its operation. Apart from ergonomic design factors, number of psychosocial workplace factors have emerged that may influence the biomechanical load or the reactions to workplace stress. The National Institute for Occupational Safety and Health (NIOSH, 2007) has outlined psychosocial factors that are related job satisfaction, intensified workload, monotonous work, job control and social support.

MATERIALS AND METHODS-
The co relational study was conducted between December 2012 and February 2013. The study protocol was approved by Institutional ethical committee of the Institute of Post Graduate Medical Education and Research. Written informed consent was obtained from each respondent.

Operational Definitions
-Work related factors related computer related health hazards
Presence of specific factors among the subjects of the present study recognized as work related factors categorized as working posture, characteristics of computer (monitor and keyboard), typing technique, mouse handling technique, exposure time measured by structured questionnaire.

-Computer related health hazards
Predicted or actual physiological (musculoskeletal, neurological, skin, eye) measured by structured questionnaire and psychological (anxiety, depression, stress) health hazards measured by standardized DASS 42 scale which were related to computer use would be considered as computer related health hazards in this study.

-Computer professionals
Individuals who work in front of computers for more than 5 hours a day or 30 hours a week in selected IT firms would be considered as computer professionals in the present study.

-Conceptual Framework
The Conceptual Framework of the study was based on Rosenstock’s (1974) and Becker and Maiman’s (1975) Health Belief Model.(5) It focuses on person’s belief on preventive health care practices exploring attitude about positive health. It provides a way of understanding and predicting how clients will behave in relation to their health and how they will comply with health care therapies. The major components of health belief model are three.
The health belief model helps us to understand factors influencing individuals’ perceptions, beliefs, and behaviour in order to plan care that will most effectively assist individuals in maintaining or restoring health and preventing illness. The conceptual framework had been presented in figure1 in the next page.
not included in the study

Figure 1 Conceptual Framework of the study based on Rosenstock’s (1974) and Becker and Maiman’s (1975) Health Belief Model.

Sampling strategy and data collection tools and techniques-
The study was conducted among 100 respondents of IT Firm IBM Kolkata, West Bengal who met the inclusion criteria as computer professionals of more than 1 year and used to work on computers for more than 5 hours a day. Professionals with mental illness were excluded from the study.

Sampling technique: The technique of sampling was non probability purposive sampling technique. Sampling was done according to the availability of the respondents on days of data collection who were enthusiastically willing to participate in the study after thorough explanation regarding confidentiality and anonymity.

Data collection tools and techniques- Structured questionnaire of 120 items were used comprising of
10 items from background information
35 items on work related factors
33 items on physiological health hazards
42 items on psychological health hazards using DASS 42 scale

Content validity of the tool was established by opinions from the 12 experts in the respective fields of information technology, psychiatry and mental health, medicine and nursing. There was 80 percent agreement in all areas of questionnaire.

Reliability for structured questionnaire for collecting data on work related factors was calculated by adopting split half method and coefficients of correlation was 0.82.

Cronbach’s alpha method was adopted for structured questionnaire on computer related physiological health hazards and coefficients of correlation were 0.77 for musculoskeletal health hazards, 0.64 for neurological health hazards, 0.74 for skin and 0.83 for eye health hazards.

Standardized Depression Anxiety Stress Scale 42 (DASS42) scale was used for (data related to computer related psychological health hazards). Reliability of the three scales established by test-retest reliability is likewise considered adequate with 0.71 for depression, 0.79 for anxiety and 0.81 for stress.

Data collection procedure - The setting for final data collection was IBM Kolkata. Formal permission was sought from respective institution. Interaction was made with computer professionals. Data collection was done on 05.12.2012-10.02.2013. The investigator obtained the information from 100 professionals by non probability purposive sampling the selection of the sample was done as per their attendance on those days. The professionals took 25 minutes to complete the tool.

RESULT AND DATA ANALYSIS-
Data was analysed by using descriptive and inferential statistics.

Finding related to sample characteristics of the respondents -
Majority of the respondents (75%) belonged to the age group of 20 to 30 years, 22% lied in the age group of 31 to 39 years and very few (3%) belonged to age group of 40 to 49 years.

Majority (77%) of the respondents were male while only 23% were females.

Fifty five percent of the respondents were unmarried and 45% were married. It was also seen from that most of the respondents (91%) used computers at home.

Maximum of the respondents (55%) had post graduation degree. Forty five percent had degree certificates and only 10% had diploma certificate.

It was also found that maximum of the respondents (62%) had more than 5 years of computer exposure. Thirty two percent had 3 to 5 years exposure and 6% of the respondents had 1 to 3 years exposure. Seventy four percent of the respondents were software developer while 11% were in administrative job. Six percent were in systems administration and 6% were in data entry. Accounts job were done by 3% of the respondent. Majority of the respondents (84%) had 8 to 12 hours of computer exposure per day. Nine percent had 5 to 8 hours exposure and only 7% had 12 hours exposure per day. Ninety one percent of the respondents worked 5 days per week. Almost equal 5% and 4% of the respondents worked for 6 days and 7 days respectively. Seventy one percent of the respondents performed no exercises. Twenty nine percent performed exercises.

Findings related to work related factors

Majority of the respondents (97%) had maintained satisfactory work position with only 3% unsatisfactory. Most of the respondents (57%) had used satisfactory monitor condition, 43% had unsatisfactory monitors condition. Eighty five percent of the respondents had satisfactory keyboard condition and 15% had
unsatisfactory one. Majority of the respondents (81%) had used satisfactory typing technique and 19% had unsatisfactory. Ninety six percent had satisfactory mousing technique and only 4% unsatisfactory.

**Findings related to computer related physiological health hazards.**

Twenty percent of the respondent had normal musculoskeletal conditions, most of the respondents (49%) had mild problem, 28% had moderate problem and only 3% had severe problem. Majority of the respondents (76%) had mild neurological problem, 6% had moderate, 1% had severe and 17% had normal neurological condition. Most of the respondents (43%) had normal skin conditions, maximum number of the respondents (55%) had skin problem, 2% had moderate skin problem and none had experienced severe problem. Twelve percent of the respondent had normal eye condition, majority of the respondents (83%) had mild eye problem and 5% had moderate eye problem and none had severe eye problem.

**Findings related to computer related psychological health hazards.**

Majority of the respondents (81%) had no anxiety, 7% had mild anxiety, 7% had moderate anxiety, 4% had severe anxiety and 1% had extremely severe anxiety. Majority of the respondents (82%) had no depression, 8% had mild depression, 8% had moderate depression and none had severe or extremely severe depression. Ninety percent had no stress, 5% had mild stress, 4% had moderate stress, 1% had severe stress and none had extremely stress.

**Finding related to relationship between work related factors & computer related physiological health hazards –**

Work related factors and the musculoskeletal health hazards scores of the respondents showed no significant relationship as per the ‘r’ value of 0.0042 and the t-value of 3.756E-05 with df-98 at any level of significance. Work related factors and neurological health hazards scores of the respondents was not significant at r-value of 0.201 and t-test value 6.585E-19 with df-98 at any level of significance. Work related factors and skin health hazards scores of the respondents was not significant at r-value of -0.0571 and t-value 1.2603E-24 with df-98 at any level of significance. Work related factors and eye health hazards scores of the respondents was not significant at r-value of 0.1889 and t-test value of 8.3174E-11 with df-98 at any level of significance.

**Findings related to relationship between working days & computer related psychological health hazards**

The relation between the working days and anxiety scores of the respondents was not significant at r-value of 0.15708 and t-test value 0.02 with df-98 at any level of significance. The relation between the working days and stress scores of the respondents was not significant at r-value of 0.022 and t-test value 0.080 with df-98 at any level of significance. The relation between the working days and depression scores of the respondents was not significant at r-value of 0.122 and t-value was 0.1611 with df-98 at any level of significance.

**Findings related to association of anxiety, stress and depression with demographic variable namely marital status, sex and education**

Significant association was found between the marital status of the respondents and their anxiety score at chi value of 5.8992* which was significant at 0.05 level at df-98. Married respondents had more stress than singles was found by computing association between marital status and stress scores of the respondents with chi-value of 4.2087* which was significant at 0.05 level at df-98. Association was found between marital status and their depression score with chi-value of 3.896* which was significant at 0.05 level at df-98. Thus it was found that married respondents had more depression than singles. Chi-value was computed to determine the association between the sex and their depression score was 87.640* which was significant at 0.05 level at df-98 inferred that female respondents had more depression than males.
DISCUSSION

The respondents had physiological health hazards which were not dependant on computer usage.
This study result was supported by the study of Paula T H et al (2006) ‘Frequent computer-related activities increase the risk of neck–shoulder and low back pain in adults’ which showed that Frequent computer-related activities are an independent risk factor for Neck Shoulder Pain and Low Back Pain.

Another study by Sumedha M J (2012) on A clinical study of ocular and visual discomfort in video display terminal (VDT) users, stated that the subjects who changed their lifestyles, had an ergonomic work station and posture had relatively symptom - free working and better work performance.

The present study couldn’t identify much computer related health hazards among the computer professionals, as the working conditions provided to the employees by the selected IT firms at Kolkata were favourable which was also evident from the data presented in relation to work related factors.

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