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MUSCULOSKELETAL DISORDERS AND DURATION OF COMPUTER USE AT CAPE COAST POLYTECHNIC, GHANA

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ABSTRACT

The aim was to determine associations between duration of computer use and musculoskeletal disorders among computer users. The objectives are: to identify the duration spent using the computer at the workplace; to determine musculoskeletal disorders on the computer users and to identify the condition of the office space. A total of 85 administrative staffs were randomly sampled for the study. A well-structured questionnaire was used for collecting data. Descriptive statistics was used to analyse the data in the form of frequencies and means. Logistic regression analyses on 85 full-time working employees showed that working almost the whole working day with a computer was associated with computer vision syndrome (which consists of eyestrain, tired eyes, irritation, redness, blurred vision, and double vision), headaches and backache recording very high mean scores as 4.73, 4.66, and 4.28 respectively. An excessive heat and or poor/inadequate lighting in the offices affect the computer users. The conclusions drawn from this study is the furniture used must be designed to reduce the musculoskeletal disorders of computer users. Ventilation and lighting systems must be provided in the offices to help save the eye sight and the general well-being of the administrative workers who constantly use the computers.

Keywords: Musculoskeletal, Ergonomics, Disorders, Duration, Computer users

INTRODUCTION

Computers have become a way of life, they are found in in our workplaces, offices, schools, libraries, cafes, trains etc. Even our communication is by the computer, our work is by the computer and family life is by the computer. Yet, working with computers can sometimes be stressful. This means that since we are spending more time on the computers we are therefore more affected by the ups and downs that they may cause us. For the younger generation using computers is like walking or speaking. There is an expectation, oftentimes self-imposed. This is because they see the ease with which a lot of people use computers. Many novice computer users, sometimes feel reluctant to ask other people for help when they need help. This can lead to an incredible amount of stress. This stress can get them angry, frustrated, or impatient with the computer from time to time.

The Musculoskeletal disorders (MSDs) remain the most prevalent form of occupational ill health, prompting examination of why attempts to manage the problem have been less successful than perhaps hoped (Ajayi and Thwala, 2012). Musculoskeletal disorders (MSDs) are the most common work related health problems. For instance, when we see how the problem is serious in Europe.



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European commission (2000) defines stress as the emotional, cognitive, behavioural and psychological reaction to aversive and anxious aspects of work, work environments and work organizations. Work-related stress is one of the problems confronting employees. It is of great concern to employees, employers and psychologists, because of its high growing rate in ill-health, as a result of long working hours of some employees.

According to Agolla and Ongori (2009), in recent years, “stress has become an important topic in academic circle” probably because of the fact that life in general is flooded by many stresses. Among civil servants, stress can be viewed as a positive or negative experience that affects their lives and performances. This is so because “office work is never without stressful activities”. The experience of stress among civil servants is considered normal but “if stress is severe and/or prolonged, it can reduce performance; interfere with a staff’s ability to participate in and contribute to work life; and increase the likelihood of substance abuse and other potentially damaging behaviours” (Richlin-Klonsky & Hoe, 2003).

Aim

The aim was to determine associations between duration of computer use and musculoskeletal discomfort among computer users.

Objectives

1. To identify the duration spent using the computer at the workplace
2. To determine musculoskeletal disorders on the computer users
3. To identify the condition of the office space.

Problem Statement

Shedy (1999) reported that 50-90% of computer users experienced the symptoms of computer vision syndrome. Computer vision syndrome is a serious problem associated with computer use and about three-quarter of computer users were suffering.

Computer vision syndrome is one of the most common complaints of people working with monitors. This problem is with eyes on vision. The complaints include strain, burning sensation etc. Most of the problems are due to fatigue caused by combination of factors.

According to Shikdar and Al-Kindi (2007), 90% of the employees used computers more than 4 hours a day, 45% of the employees adopted bent and unsupported back postures and the major problems reported were eyestrain (58%), shoulder pain (45%), back pain (43%), arm pain (35%), wrist pain (30%), and neck pain (30%). Sonal and Nisreen (2012) stated that there was health risks associated with spending much time in front of a computer.

There have been numerous operator complaints of a wide range of symptoms including headaches, general malaise, eyestrain and musculoskeletal problems. The rise in computer



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use and flat light touch keyboards that permit high speed typing have resulted in an epidemic of injuries of the hands, arms and shoulders.

LITERATURE REVIEW

Singh and Wadhwa (2006) noted that ergonomics is a science that makes product fit people. Its goals are to create products that are easy, enjoyable, safe and efficient to use. Even with well-designed visual display terminal, keyboard and mouse, it is important to set up and use equipment properly. This will help to increase personal comfort and also the output.

Various ergonomic recommendations are made by different specialists after long experience and research. By making use of these recommendations the users can avoid many health problems resulting from inappropriate video display terminals (V.D.T.) work station design.

Chaffin and Anderson (1991) considered that the seat alone is insufficient for stabilization and the use of the legs, feet and back in contact with other surfaces, as well as muscular forces, are necessary to produce equilibrium. Leg support is also critical for distribution and reducing buttock and thigh loads. Feet need to rest firmly on the floor or foot support so that the lower leg weight is not supported by the front part of the thighs resting on the seat.

Margarita (2002) conducted a study with the subject to analyze the causes of lumbar discomfort while sitting on a chair, by analyzing the relationship of lumbar curvature, pelvic inclination and their mobility with discomfort. The results revealed that great changes of posture are a good indicator of discomfort, and that lordotic posture with forward leaned pelvis and low mobility are the principal cause of the increase of discomfort.

Thus, on the basis of a comprehensive review of literature it can be concluded that computer is a marvelous tool and the only solution to the information need. But increasing use of it has given rise to many health related issue like occupation overuse syndrome, straight spine syndrome, repetitive strain injuries and cumulative trauma disorders.

However, Barden (2001) is of the view that stress is not necessarily something bad. It all depends on how a person takes it. The stress of exhilarating, creative, successful work is beneficial and that of fail, humiliation or infection is experienced irrespective of whether the situation was positive or negative. Stress is now viewed as a bad thing with a range of harmful biochemical and long term effects. These effects have rarely been observed in positive situations.

Harrold and Wayland (2002) considers that the relationship between satisfaction and productivity is reciprocal. It is not, thus, satisfaction that leads to productivity, but productivity that leads to satisfaction. Satisfaction affects productivity mainly in an indirect way, creating a feeling of dedication towards the organisation and its targets. Beyond this relationship of productivity-satisfaction-productivity, it is possible to have a secondary increase of satisfaction, provided that productivity results in the increase of



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other remunerations related to work (promotion, authority, bonus, etc) that contribute to the increase of satisfaction.

RESEARCH METHODOLOGY

A descriptive survey was used for this study. The target population for the study was all administrative staffs of the Cape Coast Polytechnic. The Simple random sampling technique was used to select a sample size of 85 out of the 102 administrative staffs for the study.

Research Instrument

The main instrument used in gathering data was the questionnaire developed by the researcher after an intensive literature review. Items in the questionnaire were mostly “close-ended”. The questionnaire was in two sections. Section “A” solicited for respondents’ demographic information while Section “B” sought information on administrative staff’s cause of work related stress and the extent of stress in relation to the use of computers.

Data Analysis

The data collected were analysed by using descriptive statistics which involved the use of frequencies, percentages, means and standard deviations were used to describe the data.

RESULTS AND DISCUSSION

From the findings on the average the respondents spend between 6 and 9 hours at the workplace. This indication is in line with working hours of government workers, since everyone is expected to work for 8 hours for most government jobs. The minimum hours spent at the workplace was recorded as 6 and the maximum 9.

The effect of sitting behind the computer for over 6 hours was also investigated. The respondents were asked to indicate whether they have suffered from some health conditions after their daily work schedule of using the computer. Table 2 present the findings.



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Table 2: Effect of Using the Computer over 6 hours a Day at the Workplace

No	Item	SD 1	D 2	NA 3	A 4	SA 5	Total	Mean
1	Headaches	3(3)	5(10)	0(0)	12(48)	65(335)	396	4.66
2	Backache	5(5)	6(12)	4(12)	15(60)	55(275)	364	4.28
3	Neck Ache	10(10)	10(20)	5(15)	13(52)	47(235)	332	3.91
4	computer vision syndrome	1(1)	1(2)	1(3)	14(56)	68(340)	402	4.73
5	Sleeplessness	15(15)	13(26)	17(51)	10(40)	30(150)	282	3.32
6	Anxiety	37(37)	6(12)	3(9)	11(44)	28(140)	242	2.85
7	Chest Pain/ Palpitations	25(25)	15(30)	8(24)	12(48)	25(125)	252	2.96
8	Indigestion/Nausea	30(30)	17(34)	12(36)	8(32)	18(90)	222	2.61

Source: Field Survey, March 2014

From Table 2, most of the respondents suffered from computer vision syndrome (which consists of eyestrain, tired eyes, irritation, redness, blurred vision, and double vision), headaches and backache recording very high mean scores as 4.73, 4.66, and 4.28 respectively. The next alarming effects that were recorded included neck ache and sleeplessness with mean scores of 3.91 and 3.32 respectively. However some of the respondents confirmed that they sometimes experience chest pain/ palpitations, anxiety and indigestion/ nausea with mean of 2.96, 2.85 and 2.61 respectively.

Table 3: Some Environmental Problems at work

No	Item	SD 1	D 2	NA 3	A 4	SA 5	Total	Mean
1	Excessive Heat	2(2)	3(6)	2(6)	10(40)	68(340)	398	4.68
2	Poor/Inadequate Lighting	15(15)	5(10)	8(24)	12(48)	45(225)	322	3.79
3	Poor Ventilation	0(0)	5(10)	0(0)	15(60)	65(325)	395	4.65
4	Poor Maintenance of Equipment	2(2)	2(4)	4(12)	17(68)	60(300)	400	4.71
5	Dust/Fumes	20(20)	10(20)	8(24)	7(28)	40(200)	292	3.44
6	Noise	35(35)	15(30)	5(15)	8(32)	22(110)	222	2.61
7	Overcrowding	30(30)	20(40)	7(21)	12(48)	16(80)	219	2.58

Source: Field Survey, March 2014



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From table 3, poor maintenance of equipment, excessive heat and poor ventilation were identified as some of the environmental problems observed by the respondents at work, mean values of 4.71, 4.68 and 4.65 were recorded respectively. While poor / inadequate lighting and dust were some of the challenges they faced with a mean score of 3.79 and 3.44 respectively. Noise and Overcrowding had the least mean scores of 2.61 and 2.58 respectively.

Table 4: Some Problematic Situation at Work

No	Item	SD 1	D 2	NA 3	A 4	SA 5	Total	Mean
1	Repetitive/ Boring	38(38)	18(36)	6(18)	8(24)	25(125)	241	2.84
2	Very Heavy Work Load	4(4)	4(8)	0(0)	17(68)	60(300)	380	4.47
3	Inadequate Break Times/ Meal Times	10(10)	5(10)	4(12)	15(60)	51(255)	347	4.08
4	Unfair Distribution of Work	40(40)	5(10)	8(24)	5(20)	27(135)	229	2.69
5	Job Insecurity	30(30)	10(20)	5(15)	17(68)	23(115)	248	2.92
6	Meeting Deadlines	5(5)	2(4)	0(0)	15(60)	63(315)	384	4.52
7	Unsocial Hours	32(32)	22(44)	10(30)	7(28)	14(70)	204	2.40

Source: Field Work, 2014

From Table 4, meeting deadlines, very heavy workload and inadequate break times/ meal times recorded very high mean scores of 4.52, 4.47 and 4.08 respectively. While the respondent also stressed that job insecurity, repetitive/ boring, unfair distribution of work and unsocial hours were some challenges that the respondents indicated and had mean scores of 2.92, 2.84, 2.64 and 2.40 respectively.

CONCLUSION AND RECOMMENDATION

From the findings of the study, a number of conclusions could be drawn. Working with the computer over 6 hours a day affected most of the administrative staffs in the institution by way of computer vision syndrome (which consists of eyestrain, tired eyes, irritation, redness, blurred vision, and double vision), headaches and backache recording very high mean scores as 4.73, 4.66, and 4.28 respectively. An excessive heat and or poor/inadequate lighting in the offices affect the computer users. The administrative workers are given heavy workloads to complete in unrealistic time. Singh and Wadhwa (2006) confirmed that a greater respondents arm and overall work posture 2-5 times in every 15 min. which reflected discomfort of the worker while working on computer. A substantial number of respondents



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could not keep thighs parallel to floor which puts pressure on the thighs while seating this was attributed to low seat height of chair used. Most of the respondents were not able to keep upper body straight while working on computer; this was due to improper support provided by chair backrest.

Computer related stress needs to be managed well since if not well managed can affect the health and life style of the workers.

Recommendations

Considering the findings and conclusions drawn from this study, the following recommendations are made:

1. That there is a need to educate the people by conducting computer workshops/seminars on safety issues related to health due to extensive computer use. Health and Safety Fact sheet, related to health hazards of computer use. This would definitely motivate the staff to get acquainted to the ergonomic behaviours and precautionary measures to develop a healthy computing environment.
2. These health problems were attributed to mismatch between human-machine interfaces and long hours of work on computer. The duration in the use of computers need to be reduced to avoid this challenge
3. Height consideration should be taken to procure the appropriate furniture for computer users to reduce the impact of musculoskeletal disorders.
4. The office space must be well ventilated and sufficient lighting system provided to reduce the effect of computer vision syndrome.

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