

Musculoskeletal Pain Associated With The Use Of Computer Systems In Nigeria

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Abstract

Introduction: Computer related musculoskeletal disorders affect millions of computer users in developed nations. With proliferation of computer systems in the developing nations, the associated musculoskeletal pain is yet to be investigated. This serves as impetus for this study.

Methods: A structured questionnaire was used to obtain information from 1250 computer users across six federal university campuses in Nigeria. The questionnaire contained two sections of 35 items. The questions requested the respondents to provide information on age, sex, years of computer usage, hours spent on computer per week, associated musculoskeletal pain, pain severity and knowledge of preventive measures. 1041 returned questionnaires were analyzed using descriptive statistics.

Result: Low back pain and neck pain were found to be the highest pain complaint with 74% and 73% respectively. 67% of the respondents complained of wrist pain, followed by finger pain (65%), shoulder pain (63%) and general body pain (61%). The knee and foot pains were the least complaints reported with 26% and 25% respectively. In terms of pain severity, low back pain, finger pain, neck pain and shoulder pain are rated to be moderate, while all other joints were said to be of mild pain.

Discussion: The results of this study indicated that low back pain, neck pain and upper limbs are the common disorders complaints among the users. The cause of the pain may be attributed to bad ergonomics among the users

INTRODUCTION

The computer has been identified as a device that has a unique potential to improve the quality of health care system as well as the efficiency of the health workers both in the developed and developing countries (Idowu et al. 2003). Despite the fact that information, communication and technology are being used to improve health care systems, there may be associated health hazard with the use of these devices.

School children and adults commonly use computers and Internet this day. Among computer users, the most common areas of complaints are the neck, shoulder and back (Glenn, 1995). Khaki and Rosemoff (1993), in their studies on 'Ergonomics in Back pain' found that poor awkward postures cause fatigue, strain and eventually pain. Poor posture may result in structural deformation of the body, muscular contractures, pain in the back and legs, decreased lung capacity, poor circulation, intravascular pressure, kinks in the bowel and many irregularities in the body (Stuart,

1995). Stuart (1995) states that muscles need stimulation to grow; they need to experience movement and maintain coordination. Good circulation also provides nutrition to muscles and joints, but they will be deprived of that if people stay in the same position all day. Prolonged sitting leads to a slackening of the abdominal muscles and curvature of the spine which in return is bad for the organs of digestion and breathing (Grandjean, 1981). Unnatural postures and bad seating can speed up the deterioration of the discs. Back pain is the leading cause of sickness and absence from work. Experts predict that one in six of employers will be affected by bad ergonomic in one year alone (Margolis and Kostuik, 1995). Benz (1995) reported that computer-related vision ailments and musculoskeletal affects millions of Computer users every year.

Most occupational illnesses are now attributed to cumulative trauma disorder (CTD) or repetitive strain injuries (RSI). Such conditions are carpal tunnel syndrome, back pain, neck pain, tendonitis and eye fatigue or some other ergonomic

causes (Niland, 2003). RSI have become the fastest growing workplace illness in the United States, up to an astonishing 770% over a decade ago (Business week, 1995).

Rob Hogan (2000) reported that concentrating on the screen for long period could reduce the blink rate and allow the tear film on the surface of the eye to dry which can result into dry and sore eyes. A study conducted by the Department of Human Factor Engineering, University of Occupational and Environmental Health, Japan, revealed that visual strain occurred after merely 60 minutes of video terminal work, which further resulted in lower productivity (Chaffin, 1995). Headaches result from several things that occur with computer work like screen glare and poor image quality (Alan, 2000). Half of American's work force (about 75 million people) that uses computers daily suffers from computer vision syndrome (Optometry Today, 2002).

Work-related upper limb disorder is a more general description of the problems suffered by people without implying a particular cause. The computer keyboard and mouse are the prime culprits but other items of everyday use can also do the damage (Stuart, 1995). Intensive use of a mouse or keyboard may give rise to aches and pains in the fingers, hands, wrists, arms or shoulders. Carpal tunnel syndrome is the leading cause of occupational illness in the United States with complained absenteeism and medical expenses costing the industry billions of dollars a year (Russel, 2001).

Since the price of computers has gone down considerably in Nigeria the number of users has greatly increased as many organizations and individuals could afford them. Consequently, complaints of musculoskeletal pain are daily reported in the physical therapy department. The aim of this study therefore was to evaluate the pattern of musculoskeletal pain associated with the use of computer.

METHOD

This study was carried out to know the pattern of musculoskeletal pain associated with the use of computer among the users in Nigeria. The instrument used was a questionnaire, 1250 questionnaires were distributed. Subjects were selected at offices, cyber cafes, classrooms and commercial centers in six federal universities in Nigeria. The university campuses were used because the users of computer and Internet are easily found there.

A questionnaire was designed and self administered to collect information on related musculoskeletal problems

associated with the use of computers. The questionnaire consisted of three sections of questions. The first section requested for background information like sex, age, years of computer experience and computer applications commonly used. Questions were asked to know if subjects are familiar with the side effects that occur as a result of using computer. The second section was designed to know the pain perception due to the use of computer systems. Pain was assessed using a 4-point pain index.

0. No pain
1. Mild pain
2. Moderate pain
3. Severe pain

Subjects were asked to identify the painful parts of the body. Twelve areas of the body were itemized at this section. The third section was designed to assess the respondents' knowledge on ergonomics and to test the knowledge of the subjects on the preventive measures, and also to know if ergonomics instructions are offered at workplaces. 1115 were returned and only 1041 (583 males and 458 females) were found useful.

RESULT

The mean age of the respondents was 29 ± 2.5 years as shown in table 1. The respondents had a mean of 6 years experience with computer with average of 6 hours spent on computer per day. 12 hours of work were lost in the last one month due to computer related pain. Few users, 28 percent were aware of preventive measures and only 3 percent had former ergonomics instructions at their work place (Table 1)

Figure 1

Table 1: Years of Experience of Computer Users

S/N	Variable	Outcome Scores
1	Number of males	46 %
2	Number of females	43%
3	Mean age	29 years
4	Mean years of experience	6 years
5	Mean hour spent on Computer per day	6 hours
6	Mean hours away from Computer Due to pain(in the last one month)	12 hours
7	Respondents that are aware of preventive measures	28%
8	Respondents that had formal ergonomics instructions at work place	3%

YEARS OF COMPUTER USAGE

Table 2 shows the years of experience of the computer user. The respondents have an average of four years of using computers. 24% of the respondents have less than a year experience; 32% has 1-2 years experience; 17% has 2-4

years experience and 18% of the respondents have been using a computer for more than five years. The data above shows that usage of computer became popular in the last 2 years and pain complaints are more common among the respondents with over four years experience with computer system in Nigeria.

Figure 2

Table 2: Years of Experience of Computer Users

Computer Experience	% of Respondents	% of Pain Complaint
0-1 year	31	21
2 years	25	43
3 years	15	57
4 years	11	81
5 years	10	93
Above 5 years	8	96

AVERAGE TIME OF USAGE OF COMPUTER PER DAY

Thirty-five percent of the respondents spent 1-5 hours, 59% spent 6-10 hours and 6% spent 11-15 hours per day with a computer. The data in Table 3 shows that the majority of the respondents spent 6-10 hours with the computer daily. Pain complaints are more pronounced with people spending 11-15 hours daily with computer. Pain perception at different anatomical regions is prompted among the respondents that use computers for 6-10 hours and 11-15 hours daily.

Figure 3

Table 3: Number of Hours Spent on Computer Daily

Number of Hours Per Day	% of Respondents	% of Pain Complaint
1-5	35	33
6-10	59	62
11-15	6	79

COMPUTER USAGE IN NIGERIA

90% of the respondents use a computer for Internet purposes like browsing, 83% of the users use computers for e-mail (i.e. sending and receiving mail and e-mail, chatting). 76% of the users use computers for word processing. 14% and 17% use it for programming and games respectively as shown in Table 4.

Figure 4

Table 4: What Respondents Use Computers For

Facilities	Percentage
Internet	90
E-mail	83
Word Processing	76
Games	17
Programming	14

PERCENTAGE OF PAIN PERCEPTION REPORTED BY THE RESPONDENTS

The distribution of the pain perception reported by the respondents is given in table 5.

Figure 5

Table 5: Pain Perception of Respondents

Pain Perception	Degree of pain	%
Low back pain	2.0	74
Neck pain	1.94	73
Wrist pain	1.93	67
Finger pain	1.55	65
Shoulder pain	1.51	63
General body pain	1.46	61
Headache pain	1.40	54
Elbow pain	1.40	51
Hip pain	1.34	40
Ankle pain	1.31	29
Knee pain	1.27	26
Foot pain	1.24	25

DISCUSSION

The purpose of this study was to examine the pattern of musculoskeletal pain associated with the use of computer systems. The results of this study indicate that low back pain and neck pain are the leading complaints among the users. This is in line with the prediction of Waverley (1999) that the increase in the computer usage at homes and work places will lead to an increase in the number of people suffering from low back pain. Stuart (1995) reported that the most common areas of pain complaints among the computer users are the neck and shoulder. While back pain is linked with poor sitting posture, faulty furniture (Grandjean, et al. (1981), neck pain may be resulting from wrong placement of monitors. Dennis and Robinson, (1996) and Garden (1995) advised that monitors at the level on properly positioned furniture could prevent back pain. Upper extremity disorders are usual complaints as recorded in this study. The majority of the respondents complained of shoulder, wrist and finger

pains. In the recent times, several authors had identifies this problem among computer users (Pascarelli and Hsu, 2001; Palmer, et al. 2001). Palmer et al. (2001) studied the relationship between upper limb symptoms and keyboards users. They conclude that the use of keyboards was associated with discomfort at the shoulder and wrist or hand. All frequent computer users usually feel the twinges that results from an entire day of mousing and typing causing aches and pain around the fingers (Hedge, 2000). These symptoms are the clinical features usually linked with the onset of carpal tunnel syndrome.

Lacy (1990) concluded from her four years study that looking down on the low monitor pitches the head forward, placing strain on the neck muscles which in turn spasm. The spasms aggravate pressure on the nerve that emanates from beneath the seventh vertebra of the cervical spine from the C8 nerve root area which is connected to the median nerve. This eventually causes the symptoms associated with carpal tunnel syndrome. CTS may worsen to a point where the nerves in definitely damaged.

Problems in productivity, absenteeism, turnover, increased costs, decrease accuracy and low morale are directly linked to aches and pain, vision problems and comfort levels in the computer intensive environment (Niland, 2003). Our study confirmed this assertion and the respondents indicated that they were off from work to several hours due to pain. Though the computer technology is advancing at a faster pace, little is done in preventing the ailments that are associated with its use. Many experts advocate good working posture ergonomic and stretching exercise to ease the pain when using a computer. The majority of the respondents had no former ergonomic instructions at their workplace. This might be connected with a high incidence of musculoskeletal pain. The result of this study should be interpreted with caution because of several limitations. First the questionnaire used to collect was based on self reports which can be subject to recall bias that may under- or overestimate the pain perception recorded. Secondly, there may be other possible causes of musculoskeletal pains which we did not control in this study, such as smoking.

CONCLUSIONS

The result showed that the most complained problems are low back pain, neck pain and wrist pain. Foot and knee pain are the least complained pain when operating on computer systems. Pains are more severe in people with more than four years working experience on the computer system.

Practically, the result of this study can help in preventing occupational injury associated with the use of computer with emphasis on good posture, workstation design and making of computer hardware.

In the concept of preventive rehabilitation, the role and scope of expertise of the physiotherapists must be enlarged in providing advice and education towards proper ergonomics. Counseling and working with authorities of different offices will further assist in reduction of occupational injuries that can lead to different musculoskeletal pain among computer users. There is also need to focus on research, health planning and health education for computer users.

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