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Health consequences of long hour use of computer on the teaching and non-teaching faculty in an educational institution

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Abstract

Computer has become an essential part in an educational institution. However long duration computer use has been associated with many health issues. Back and neck pain, headaches, eye problems and shoulder and arm pain are common computer-related injuries. This study aims to find the health effect of long duration use of computer among the working employee (teaching and administrative staff) of Prince Sattam bin Abdul Aziz University, Wadi Addawasir. Data was collected from 100 faculties by using questionnaire as a tool. The objective of the questionnaire is to obtain information regarding their working hours, duration of computer use in job hours; complain of neck pain, back pain, weight gain and eye problems. Information were also collected regarding their involvement in physical activity. Result shows that major percentage of the faculty complains of neck pain, back pain, weight gain and eye problems such as dryness, headache, and irritation to significantly level. Result also shows that less percentage of faculties are involved in the physical activity. Thus long duration use of computer in the job hours has shown the prevalence of health issues to a significant level among the faculties in an educational institution. Professional development programs should involve the strategies to deal with the health consequence of long duration computer use. There is need for proper awareness programs and workshops to follow safety measure while using computer to prevent health injuries for a better productive work.

Key words: computer, health issue, teaching faculty

Introduction

Computer in the educational institution is used for academic and administrative purposes. Computers have brought immense benefits, but is related with many health issues such musculoskeletal problems and computer vision syndrome.[1, 2, 3,4,5] Common cause for these disorders is use of computers extensively over a prolonged period of time in a static body position, that needs prolonged muscular contractions, and use of force.[1,2] Arm, neck and shoulder pain are the most common complaint.[6] Occupational myalgia, among the computer users is due to prolong hour of sitting in improper posture stressing the spine and back muscles.[6] Improper postures and bad seating can speed up the deterioration of the discs due to increased disc pressure as a result of over loading leading to disc injuries and backache.[6] The pathophysiological aspect of work-related musculoskeletal symptoms and pain has been explained in several studies.[7, 8] Thus long duration use of computer is a risk factor for musculoskeletal symptoms of the neck and upper limbs.[9, 10.] The cause of the back pain, neck pain and upper limbs may be attributed to bad ergonomics among the users.[11, 12] similarly eye symptoms such as dryness and irritation has also been associated with computer related work. It has been suggested that eye irritation is due to staring at computer screen without blinking for long duration and straining of eye muscle. Staring the computer screen for long period of time will decrease the blink rate thus resulting into drying and soreness of eyes.[10, 13,14,15,16] Headache is as a result of over loading the information and excessive brightness or over-illumination.

There is a growing concern about the effect of computer use on the visual and musculoskeletal health. The faculties especially in the educational institution using computer for long hours for academic and administrative work are more exposed to these computer related health issues. There is an urgent need for interventional strategies on working technique and workstation layout in the educational institution. At present very little research has been conducted on health and safety issues associated with computer related health injuries in an educational institution where computer is being used extensively by the faculty for academic and administrative related work.

The objective of the present study is to look for the percentage of faculty suffering from

combination of health related risk factors such as musculoskeletal disorder computer vision syndrome and weight gain due to long hour use of computer in the academic educational institution.

1. Methodology

This main focus was directed towards the musculoskeletal disorder, weight gain and visual related symptoms among the computer users in an educational institution. The study was carried out on the faculty of Prince Sattam bin Abdul Aziz University, Wadi Addawasir. In order to get the information about the health effect due to use of long computer in their job work, questioners were distributed. Data was collected from 100 faculties. The questioners obtains information regarding their work experience in the university, work hours per day, duration of use of computer during the job hours, any complain of neck pain, back pain, weight gain and eye problem like blurred vision, tear, irritation, headache, and dryness. Information was also collected regarding involvement of faculty in physical activity and suggestions regarding the recreational activities between the work times. The response rate was 100 percent. The prevalence of computer related health effects were expressed in terms of percentage. The statistical significance level $P < 0.05$ between the observed variables were determined by using Chi-square test. The analytics software 19 version software for statistical analysis were used(IBM, SPSS Inc, United states).

Result

Result shows that the faculties were having a minimum of two years to eight years of work experience in the Prince Sattam bin Abdul Aziz University. The minimum work duration is seven hour per day. The amount they spend on the computer is a minimum of three to five hours during the work duration. The questioners were distributed and the data was collected from 100 faculties. **Figure 1** and **Table1, 2** shows that out of 100 faculties, 67 complained of neck pain that accounts for 67 %($P < 0.05$). 66 complained of back pain accounting for 66 %($P < 0.05$). 69 complained of eye problems such as eye irritation, headache, blurred vison, dryness that accounts for 69 %($P < 0.05$). Result also shows that there was increase

response for the weight gain tendency among the faculty with 65 giving positive response accounting 66 %($P < 0.05$). Only 43 faculties out of 100 are involved in the physical activity after the job hour. Hence result shows that all the health issues such as neck pain, back pain, weight gain and eye problems associated with long hour computer use were statistically significant except for physical activity. 68 responded positively for recreational activity between the working hours.

Figure1: No of Faculty response for health effect due to long hour of computer use.

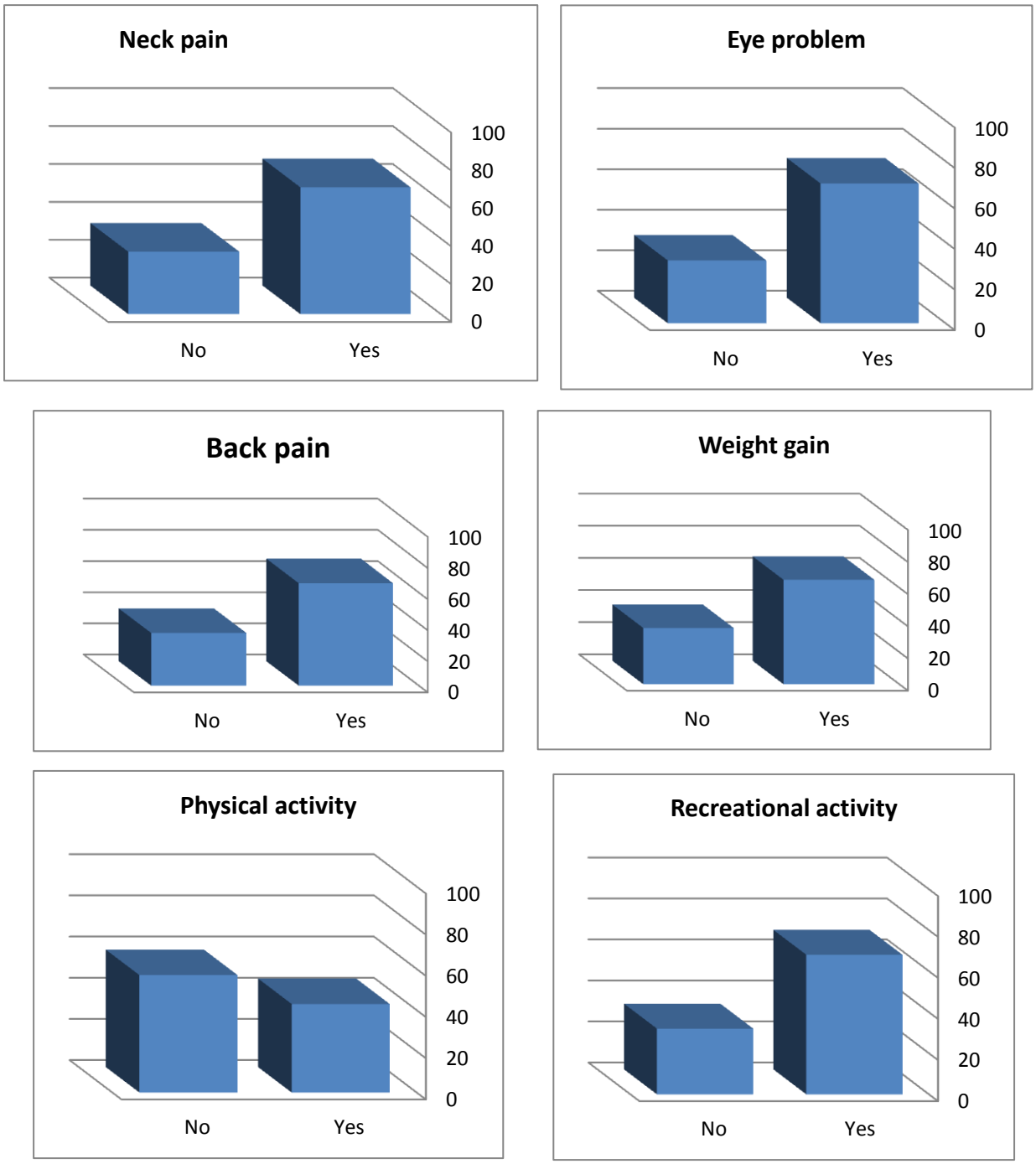

Table 1: Faculty work hour, work experience and duration of computer use.

No of Faculty	Working experience	Working hour per day	Duration of computer use during work hour everyday
100	2 to 8 years	7 Hours	3 to 5 Hours

Table 2: Percentage of faculty suffering from computer related health issues

Recorded health effects	Responded Percentage
Neck pain	67.60%
Back pain	66.60%
Eye problem	69.70%
Weight gain	65.60%
Physical activity after job hours	43.70%
Suggest recreational activity between job hours	68.70%

Discussion

Present study shows that faculties working in the education institution are exposed to health related issues due to long hour sitting in front of computer. Significant percentage of faculties are suffering from neck pain and back pain as a result of long hour sitting in front of computer. This study supports the finding that disorders involving the shoulders and neck in particular are associated with computer work. [13, 14] Prevalence and incidence of musculoskeletal and visual disorders using video display terminals were also reported by many researchers that varied from 10% - 62%.[17,18,19,20,21,22] Muscular contraction during a poor posture and prolonged static positions without support can leads to chronic pain and musculoskeletal disorders when maintained over long periods of work.[23] Studies have suggested that partial obstruction of the blood vessels can result in the fatigue and degeneration of the muscle fibers

over long periods of time.[23] which is particularly acknowledged in trapezius, that explain the pain related to neck and shoulder with use of computer work.

The WHO concluded that musculoskeletal discomfort associated with computer related work are avoidable by preventive measures in the workplace.[24] In another study 80.6% of the participants reported computer-related musculoskeletal complaints.[25] Musculoskeletal complaints defined as pain, numbness and tingling in arms, back, shoulder or neck and the symptoms such as headache, eye dryness, burning, watering, stiff shoulders, low back pain during or after working on a computer is due to straining of muscle and sitting in an incorrect posture. These symptoms were reported to be higher with longer duration.[5, 26, 27, 28, 29]

Result also shows that most of the faculty complains of computer vision syndrome, a condition in which a person experiences one or more of the following eye symptoms due to eye strain (irritation, heaviness), tiredness of eyes, watering of eyes, redness of eyes, blurring of vision, dry eye, discomfort, double vision, headache. Similar eye discomforts were reported by other studies due to use of a visual display terminal that can leads to visual defects.[5, 30, 31], [32, 33].[35],[34]

It has been suggested that, visual issues associated with long hour computer use is as a result of decreased blinking reflex while starring at the screen. The normal blink rate in human eyes is 16–20 per minute. Studies have shown that the blink rate decreases to as low as 6–8 blinks/minute for persons working on the computer screen. Incomplete blinking has also been shown to be present among computer users.[36.80,37] Environmental factors produce corneal drying due to humidity, air conditioning and use of ventilation fans.[38] Another possible explanation given is that, viewing any form of near object requires appropriate accommodative responses to provide clear vision for a near object. An inaccurate accommodative response or a failure to relax succeeding the near-vision demands is one of the causes for computer vision syndrome.[38]

Our result also shows that faculty's response for weight gain tendency was significantly high. Most of the faculty works minimum of seven hours per day and the use of computer during this work hour is three to five hours that requires more of static positioning and less of physical involvement of the body. These lifestyle changes were independently associated with

long-term weight gain due to imbalance in the calorie intake and calorie burned.[39] Our finding supports the view.[40] Prolong sitting is considered to be a factor for weigh gain[41] and can predisposes an individual to cardiovascular diseases, diabetes and obesity. Further it is suggested that less physical involvement of the body can leads to suppression of skeletal muscle lipoprotein lipase activity and reduced glucose uptake. [42, 43, 44, 45, 46] Studies have shown a positive relationship between weight gain and cardiovascular disease mortality rate with prolong sitting.[47] There was a significant response for establishment of leisure time activity during the job hour in the present study. Leisure time activity during occupational sitting is associated with decrease in the body mass index and increase in the body mass index in the occupational sitting with sufficiently inactive individuals.[48] Significant association was also found between the occupational sitting and body weight in black women.[49] Long duration use of computer by the faculty in the academic institution is susceptible to health hazards. Stress due to information overload, backache due to prolong sitting, eye strain and headache are common health hazards with the computer-users. Proper precautionary measures are required for safe use of computer equipment to avoid musculoskeletal disorders, computer vision syndrome and weight gain. Appropriate workstation design, maintaining good body posture and avoiding prolong static posture of the body.[50] Self-Directed Physical Exercise Training Program (SDPETP) should be encouraged for at least fifteen minutes to promote healthy life and better productivity.[50]

Conclusion

Our survey has shown that faculties in the academic institution has higher prevalence of health issues such as neck pain, back pain, visual disorders and weight gain due to long hour sitting in front of computer. There is a need for knowledge about the safety precaution to be undertaken while using computer for long hours to avoid further health related injuries. Awareness programs and workshops should be conducted as a part of professional faculty development program in the academic institution.

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