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Original Article

Knowledge and Practices of Ergonomics in Students of Private Universities Using ComputersLaptops

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ABSTRACT

Background: Using computers in an awkward posture for a prolonged period leads to musculoskeletal disorders. The proper use of ergonomics while using a computer or laptop is imperative. Improper use of computers may affect health and cause musculoskeletal disorders. **Objective**: To determine the knowledge and practices of ergonomics in students of private universities using computers or laptops. **Methods**: It was a cross-sectional survey conducted in different private universities in Lahore the data was collected through a self-made questionnaire. The sample size is 600 calculated by using a 90% confidence interval and a 5% margin of error. Data were collected from both male and female students aged between 18 to 26 years' private university students using laptops or computers for at least five years and students who have musculoskeletal disorders and desktop computer users for less than five years were excluded. The categorical variables were evaluated by frequency and percentages, while mean and standard deviation were calculated by continuous variables. **Results**: Despite the presence of chair arms, 46.2% of employees can easily reach their workstations, while 53.8% are unable to do so. About 46.2 percent of people find it difficult to relax their arms and shoulders without the arms of their chair interfering. 53.8% of people can relax their arms and shoulders without being hindered by the arms of their chair. When working on a keyboard, 55.3% of people have their shoulders relaxed and not raised, whereas 44.7% have their shoulders raised and are not relaxed. 54% of people prefer to rest their arms at their sides rather than have them extended out in front of them, while 46% prefer not to rest their arms at their sides and instead have them stretched out in front of them. **Conclusion**: It was concluded that knowledge and practices of computer ergonomics in students are essential to avoid various health, postural and musculoskeletal problems. Ergonomics interventions aimed to prevent musculoskeletal disorders can be applied through the assessment of risks and safety measures. Occupational therapists and physical therapists can help computer workers regarding the posture and guidelines required for prolonged computer work.

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INTRODUCTION

Musculoskeletal disorders are injuries or dysfunctions influencing muscles, bones, nerves, ligaments, tendons, joints, ligaments and spinal curves. Musculoskeletal disorders include sprains, strains, tears, soreness, pain, and connective tissue wounds of the structures. As indicated by the National Institute for Occupational Safety and Health, a few epidemiological reviews have exhibited confirmation of a causal connection between physical efforts at work-related musculoskeletal disorders (WMSD). A few elements have been related to WMSD, for example, dreary movement, ungainly as well as supported stances, and delayed sitting and standing.[1,2]

The term 'neck and shoulder pain related to computer use' is characterized as the neck and shoulder issue brought about by monotonous or potentially nonstop PC work. The sum and degree of computerization have expanded quickly, and the scatters, for example, NSP and low back pain (LBP), which are identified with PC utilization, have turned out to be increasingly common.[3,4] Basic surveys have demonstrated that ergonomists ought to know about the ergonomic ramifications of regular legitimization methodologies in individual work environments with a specific end goal to fulfil partners and in addition avert musculoskeletal disorders, a typical reason for perpetual disability.[5]

Workers exceedingly presented to both physical and psychosocial working environment hazard elements will probably report indications of a musculoskeletal issue than specialists very presented to one or the other. The outcomes recommend an association between these hazards considering the working environment that intensified the likelihood of revealing side effects in the upper appendages.[6,7] A prior paper depicted the workplace and the well-being circumstance of creation specialists at a little Norwegian industrial facility, preceding a broad ergonomics exertion that essentially meant to diminish static muscle strain by building new work environments.[8,9] It was presumed that the old work circumstance fundamentally added to an abnormal state it musculoskeletal disarranges, undoubtedly because the old work circumstance made it important to work with an abnormal state of muscle load for long stretches of the working day.[10,11] The significance of an ergonomics contribution to a plan is currently perceived by numerous enterprises as being basic. The expanding many-sided quality of present-day frameworks and the social, monetary and authoritative weights for good outline has prompted the interest for the ergonomics contribution to be made accessible as ahead of schedule as conceivable in the configuration program, beginning ideally at the idea organize.[6,12]

Generally, ergonomists have needed to hold up until the ridicule-up stage before having the capacity to perform a point-by-point assessment of a model plan the knowledge and practice of computer ergonomics is significant because working for extended hours on computers with improper posture, leads to health problems. This research gives awareness about computer workstations and ergonomics to students, who do daily basis work on laptops or computers.[13] The purpose of the study was to determine the knowledge and practices of ergonomics in students of private universities using computers or laptops.

METHODS

It was a cross-sectional survey conducted among 600 students of different universities such as the University of Central Punjab, the University of Management and Technology, the Superior College and The University of Lahore, Lahore completed in 6 months using non-probability convenience sampling. The study was approved by the ethical committee of Link Medical Centre. The sample size is 600 calculated by using a 90% confidence

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interval and a 5% margin of error. Data were collected from both male and female students aged between 18 to 26 years' university students using laptops or computers for at least 5 years. Students who had musculoskeletal disorders and desktop computer users for less than 5 years were excluded from study. Written consent was taken from all the students. All participants fulfilled the questionnaires and the data was collected using questionnaire forms. Their response sheets were saved in a secure place to avoid any biased results or misuse of personal information. Using SPSS version 25.0, the data was analysed and the categorical variables were evaluated by frequency and percentages, while mean and standard deviation were calculated by continuous variables.

RESULTS

Table I: Percentages of Different Variables

Variable	Yes (percentage)
Are your knees bent at approximately a 90-degree angle?	37.05
Does your chair support your lower back?	57.00
Is there enough space between the front of the seat and the back of your knees?	42.00
Are your chair's arms going to make it difficult for you to reach the required objects?	46.02
Are your arms and shoulders free to relax now that nothing is holding them back, such as chair arms?	53.08
Do you keep your shoulders down and relaxed when typing, or do you lift them?	55.03
Are your arms at your sides, rather than outstretched in front of you?	54.00
Is it possible for you to reach the mouse without extending or turning your arm outward?	48.05
Is your keyboard about at the same height as your elbows, with your forearms resting flat and level?	55.00

About 37.5% of people bend their knees to roughly 90 degrees, whereas 62.5 percent do not. 57% of chairs provide lower back support, compared to 43% of seats that do not. Almost 42% of respondents had 2-3 inches of space between the front of the seat pan and the back of their knees, whereas 58% did not have this amount of space. Despite the presence of chair arms, 46.2% of employees can easily reach their workstations, while 53.8% are unable to do so. While 46.2% of participants find it difficult to relax their arms and shoulders without the arms of their chair interfering and 53.8% of people can relax their arms and shoulders without being hindered by the arms of their chair.

When working on a keyboard, 55.3% of people have their shoulders relaxed and not raised, whereas 44.7% have their shoulders raised and are not relaxed, 54% of participants prefer to rest their arms at their sides rather than have them extended out in front of them, while 46% prefer not to rest their arms at their sides and instead have them stretched out in front of them. BOUT 51 percent of people cannot reach their mouse without extending their arm outside or to the side.

Without doing so, just 48.5% of individuals can reach their mouse. 55% of keyboards are at elbow level, with forearms level and flat, whereas 45% are not at elbow level, with forearms level and flat. About 45.7% of those who combine computer and phone work for more than an hour everyday used a headset, while 54.3% did not. Input devices at the same level as the keyboard were present in

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40% of the keyboards, but not in 60%. Almost 47.7% of people used an easily accessible and nearby adding machine, whereas 52.3% used an adding machine that was not easily accessible and nearby. While 53% of people had their keyboards in front of them, while 47% did not. About 37.3% of people took many short breaks during the day to alleviate weariness, whereas 62.7% did not. 52.5% of workers say they were not comfortable or pain-free on the job, while 47.5% said they were.

Table II: Percentages of Variables

Variable	Yes (percentage)
Do you use a headset if you spend more than an hour a day on the phone while also using a computer?	45.07
Are all your input devices (mouse, tablet, etc.) at the same level as your keyboard?	40.00
If you use an adding machine, is it close and easy to reach?	47.07
Are your keyboard and monitor located on a central line in front of you?	53.00
Do you take regular, short breaks during the day to minimize fatigue?	37.03
Can you carry out your responsibilities without trouble or pain?	47.05

DISCUSSION

This study was designed to determine the knowledge and practices of ergonomics in students of private universities using computers or laptops. Results showed that more than half of the students did not had the knowledge of safe computer ergonomics and those who knew still did not practice ergonomics. According to the findings of this research, the majority of pupils who used computers for an average of two to five hours per day acquired computer vision syndrome.[14,15]

Individuals who spent an average of six to eight hours each day in front of a computer had greater cardiovascular symptoms, according to the findings of Akinbinu and Mashalla's study. Respondents who used computers for more than five hours each day were more likely to have CVS, according to the findings of Rahman and Sanip's research. Reddy and colleagues discovered that computer usage for more than two hours per day was substantially related to the beginning of CVS symptoms.[16,17] the most often reported symptoms in our research were headaches, eye strain, neck discomfort, weariness, and red eyes. Logaraj and his colleagues noted symptoms such as redness, a burning feeling, headache, dry eye, and soreness in the neck and shoulders in research done in Chennai.

In prior research, Shantakumari and colleagues discovered that headaches, a burning feeling in the eyes, and dry, fatigued,

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or irritated eyes were the most prevalent types of visual impairments.[18,19] Mahalingam and colleagues reported that the most prevalent symptoms were a burning sensation in the eyes, dry eyes, headaches, weariness, and neck and shoulder discomfort throughout their examination. Akinbinu and Mashalla both said that their most common symptoms were headaches and eye pain.[20,21]

Students were experiencing symptoms as a consequence of insufficient viewing distances from computer displays, a lack of screen filters, and a lack of regular computer breaks. If students had taken more frequent breaks, some of these symptoms may have been prevented.[22,23] Making use of screen filters In a research done by Akinbinu and Mashalla in Nigeria, participants said that the most common preventative measures they used were frequent breaks, regular eye examinations, and utilizing anti-glare computer screens.

A study on Malaysian university students done by Reddy and colleagues, participants stated that rubbing their eyes, gazing away from their screens at items farther away, viewing the monitor at an angle lower than their eyes, and using eye drops lessened the intensity of their symptoms. Taking breaks between jobs, utilizing materials that reduce radiation exposure, and so forth.[24,25] Safe computer ergonomics is recommended not only for better health but also for increasing efficiency and productivity. In this research, the vast majority of pupils lacked knowledge of proper head, neck, and back posture. A similar finding was achieved in a prior study: the majority of respondents lacked the essential grasp of ergonomics concepts.

CONCLUSION

It was concluded that knowledge and practices of computer ergonomics in students are essential to avoid various health, postural and musculoskeletal issues. Ergonomics interventions aimed to prevent musculoskeletal issues can be applied through the assessment of risks and safety measures. Similarly, occupational therapists and physical therapists can help computer workers regarding the posture and guidelines required for prolonged computer work.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.
Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.
Competing interests: None
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