

**ASSESS THE AWARENESS OF ERGONOMICS AMONG THE UNDERGRADUATE
PHYSIOTHERAPY STUDENTS OF UNIVERSITY OF BALOCHISTAN, QUETTA
PAKISTAN**

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ABSTRACT

Ergonomics is the study which deals with different anatomical, physiological and psychological principles interacting with the people and to adjust the working environment and equipment's to fit with abilities and limitations of people. A cross sectional survey was carried out in university of Balochistan and the data was collected from September to November 2020. A self-created proforma was filled by 223 under graduate students, and Spss version 23 was used. It was observed that 151 (67.7%) participants were aware of the word Ergonomics, 133 (59.6%) students admitted that they have musculoskeletal problems and 186 (83.4%) considered prolong standing or sitting as the major reason for discomfort, hence affecting generalized body and work efficiency. While 221 (99.1%) students considered that maintaining Good body posture will improve their health and increase productivity during work. It is concluded that majority of students only knew the word Ergonomics but they were not aware about the benefits of implementing ergonomics, for the reduction in annual incidence of Work-related musculoskeletal disorders and increase the efficiency during work; right and timely application of ergonomic principles is required. Whereas the practicability of ergonomic principles is a function of its awareness and work station.

KEYWORDS: Ergonomics, Physiotherapy students, Quetta, Pakistan.

INTRODUCTION

International Ergonomics Association describes Ergonomics is the study which deals with different anatomical, physiological and psychological principles interacting with the people and to adjust the working environment and equipment's to fit with abilities and limitations of people.^[1,2] Ergonomics creates a comfortable and safe work atmosphere to achieve highest productivity; Thus, Ergonomics aims at fitting the task to the workers to reduce the risk of injury.^[3]

Mostly people do not have enough knowledge regarding ergonomics and they work at the cost of their health in order to get wealth. It is observed that people who are unaware of proper workplace environment, usually face health problems.^[4] Among all the occupational health problems the different Musculoskeletal disorders (MSDs) are usually very common and costly.^[5] MSDs

are the conditions which occur due to static posture resultant leads to increase in muscle tension and decrease in tissue elasticity which causes pain and abnormal working posture.^[6] Contributing factors that can develop musculoskeletal injuries are: improper postures, bending, twisting, frequent reaching, carrying, lifting or grasping heavy loads and Static postures.^[7] Mostly neck, arms, hands and back are prone to MSD's.^[8] 2.2 million people died annually because of occupational diseases and accidents.^[9] Throughout the world the total number of people suffering from musculoskeletal conditions has increased by 25% over the last decades.^[10] E Heyman, et.al (2009) reported that adults and children suffer from musculoskeletal disorders and back pain.^[11] Dissanayaka T. (2014) quoted that North American Spine Society (NASS) reports 42.6% of physicians have treated patients who were suffering from spine trauma or back pain.^[12]

Work related musculoskeletal disorders constitute over 50% of all occupational diseases. WMSD's are a considerable source of injury to all the healthcare workers, especially physical therapists.^[13] There is a great association between the percentage of working hours while sitting (i.e. Chair workers) and neck pain among workers/students observing that they have hump-back and bent posture damaging the joints, ligaments and tendons.^[6,14,15]

To reduce the forecasted annual incidence of the injuries, ergonomics plays a pivotal role.^[10] Ergonomics can reduce the incidence of injury from poor work place and increase health and safety performance.^[19] Design of workstation has great influence on our health.^[16] The application of ergonomics to design a workplace according to the task of job, for the workers and overall environment is called as Ergonomic Design. Ergonomics, designs work stations, tools and machines so that tasks can be obtained through the maximum efficiency and minimal fatigue.^[15,17]

The best way to minimize the work related musculoskeletal disorders are ergonomic training programs. Therefore it is advisable to make ergonomics an important part of the curriculum in every institute. Ergonomic awareness educational programs and trainings should begin in all institutes and workplaces because the benefits of implementing the ergonomic training programs include; decrease in injuries, reduced absenteeism, cost effectiveness and amplified productivity.^[12,18,19] It is found that ergonomic devices and programs can enhance patient's quality of life in both ways physically and psychologically. Previously, many studies has been conducted internationally regarding the awareness of Ergonomics.^[3]

MATERIALS AND METHODS

Study Design, Settings, and Duration

A cross sectional study was carried out from September to November 2020 and data was gathered from the undergraduate physiotherapy students of University of Balochistan, Quetta, Pakistan.

Sampling

Convenient Non-Probability Sampling Technique was used among 223 healthy male & females undergraduate physiotherapy students who were acknowledged their voluntary participation in the study, While, Participants with any disability, pathology and unwilling to give the concerned inform consent for study were excluded.

Data Collection Tool

A self-created proforma was used for the gathering of data, that comprises the demographic Characteristics (age, gender) whereas it covers the ergonomically awareness monitoring characteristics were (awareness of ergonomics, reasons of discomfort among participants,

reasons of discomfort among participants & musculoskeletal problem among participants)

Data Collection Procedure

During the data gathering, participants were requested to lade the questionnaire on the spot only minor help was provided in order to understand the questionnaire.

Data Analysis Procedure

Data was evaluated and showed in frequency and percentages for categorical variables, mean were presented for continuous variables. The 23rd version of Statistical Package for Social Sciences was used.

Ethical Consideration

The ethical approval was received from the ethical inspection committee of Faculty of Pharmacy & health sciences University of Balochistan, Quetta, Pakistan.

RESULTS

Demographic Characteristics

Demographic Characteristics are stated in table I, that shows the majority (n=154, 69.1%) were female and having the mean age of 20.4 ± 1.92 years.

Table 1: Demographic Characteristics.

Variable	Frequency	Percentage
Age		
18 to 25 Years	223	100
Gender		
Male	69	30.9
Female	154	69.1

Awareness of Ergonomics

Awareness of ergonomics are stated in table II, that shows the majority (n=151, 67.7%) were found aware regarding the ergonomics.

Table II: Awareness of Ergonomics.

Variable	Frequency	Percentage
Yes	151	67.7
No	72	32.3

Reasons of Discomfort among participants

Reasons of discomfort among participants are stated in table III, that shows the majority (n=186, 83.4%) were not feeling comfortable during the prolong standing or sitting.

Table III: Reasons of Discomfort among participants.

Variable	Frequency	Percentage
Continuous standing or sitting for long time	186	83.4
continuous reading or computer work for long time	17	7.6
Wearing of discomfortable shoes like heels	14	6.3
no idea	06	2.7

Musculoskeletal Problem among participants

Musculoskeletal Problem among participants were stated in table IV, that shows the majority (n=133, 59.4%) were found involved themselves in different musculoskeletal problem.

Table III: Musculoskeletal Problem among participants.

Variable	Frequency	Percentage
Yes	133	59.6
No	90	40.4

Maintenance of Body Posture among participants

Maintenance of Body Posture among participants were stated in table V, that shows the majority (n=221, 99.1%) were found themselves more healthy and they have increased their work productivity after maintaining the good posture.

Table III: Musculoskeletal Problem among participants.

Variable	Frequency	Percentage
Yes	221	99.1
No	02	0.9

DISCUSSION

The awareness of Ergonomics among the under-graduate physiotherapy of University of Balochistan, Quetta was assessed and it was observed that 67.7% participants were found well aware of the word 'Ergonomics' on the however a study conducted in Malaysia revealed that 35.6% manufacturing industries have a low level of ergonomics awareness.^[20] Another observational survey was conducted among dentists and found that the 55.7% of dentists had good knowledge about Ergonomics.^[21] Ismaila S.O (2010)^[10] study showed the results that out of 200 respondents in the education sector, only 10 (1.1%) and 20 (2.1%) from medical profession had heard of ergonomics. Study conducted by Sarfraz M et.al (2013) found that only 28.67% respondents had heard the word ergonomics.^[3] Another study conducted on awareness and knowledge of Ergonomics among medical laboratory scientists in Nigeria showed that out of 106 participants, 27 (25.5%) participants reported that they have heard the term Ergonomics.^[2] Stone R, et.al (2004) in their study described growing relevance of ergonomics or human factors principles and methodologies to medical and surgical practices, emphasizing the importance of moving away from "technology push". The results showed that the successful appliance of ergonomics demands commitment and participation from

each and every different levels of different healthcare organization.^[22] Goggins R, et.al (2008) found that out of 250 case studies, an average of 75% had lost work days due to work related musculoskeletal disorders and the absenteeism rate was 58%.^[19] Franco G. (2011) describes in his study that the musculoskeletal problems are the major cause of health problems leading to workers disability, the lost time from work and the social costs. He observed a variety of musculoskeletal disorders among workers (such as sedentary workers, secretaries, people who do fine work) sharing exposure to risk factors potentially similar to those of professionals using a microscope. As per advise "give up that habit of keeping the head constantly bent and the eyes fixed on what they are making". Particularly, exposure to different repetitive movement and static posture are regarded as the most common risk factors for MSDs of the neck and arm as compare to other body parts.^[15] 59.6% participants in our study accepted that they are suffering from musculoskeletal problems. A greater number of respondents, 72.33% acknowledged that they have musculoskeletal problems due to poor ergonomics.^[3] Messing K, et.al (2008) reported 9.4% people have pain in ankle or foot and 6.4% have lower leg or calf pain.^[23] D'Souza J, et.al (2005) in their study review of bilateral lower extremities the musculoskeletal and vascular disorders showed a greater prevalence 83% for foot and ankle pain.^[24] Mailoa E, et.al (2011) claimed same musculoskeletal problems by 56.8%.^[21] Gopinadh A, et.al (2013) reported that 73.9% participants have musculoskeletal pain.^[25] Hussain H, et.al (2015) stated in their study that majority of students claimed that they know about the suitable posture but after conducting this study the results revealed that there was inadequate knowledge among students.^[26] Only 34% of the students correctly defined good posture. It was concluded that still the students need to know the principles of ergonomics regarding use of electronic devices, chair sitting and overall workstation. A majority of students 70 % regarded that a good body posture is important because you look fit and healthy. 12.6% considered that it prevents all musculoskeletal disorders, 10.3% stated that it prevents from fatigue and other stress and only 7.2% said that it prevents from pain and body ache. As compared to Sarfraz M, et.al (2013) study, the results were 14.67%, 40%, 18.33% and 14.33% respectively.^[3] From our results it was observed that 99.1% of the participants thought that good body posture will improve their health and increase their overall productivity especially in their activities of daily life. Nearly same results 82% were found by Sarfraz M, et.al (2013). Goggins R, et.al (2008) measured; effectiveness from

250 cases the results showed an average 25% increase in productivity.^[3,19]

CONCLUSION

From the present study it can therefore be concluded that majority of students have heard the word ergonomics and accepted that by maintaining a good posture their health will be improved and their productivity during work will be increased. In spite of that most of the students admitted that their posture causes problems in their study and working environment. These problems occur because students are not aware about the benefits of ergonomics and the principles of ergonomics are not implemented in the workplaces.

A number of students suffer from musculoskeletal problems which contributes absence from classes due to illness. This can be prevented by the right and timely application of principles of ergonomics and by improving workstations thus promoting the health and efficiency of the students.

Recommendations

In future the Ergonomics awareness events and seminars should be conducted in order to enhance the knowledge among students as well general population.

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Conflicts of Interest

The authors hereby declares that there is no any kind of conflict of interest in this study.

Author contributions

All authors contributed equally.

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