Assessment of Knowledge of Ergonomics among Information Technology Professionals in India

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Background: Ergonomics is the scientific study of human work. The objective of ergonomics is to obtain an effective match between the user and work station to improve working efficiency, health, safety, comfort and easiness to use. Ergonomics is a relatively new concept in India yet to be considered an essential component of most enterprises.

Objectives: To assess the Computer usage and Knowledge of Ergonomics among Information Technology professionals working in Karnataka, India.

Materials and Methods: In this Cross-sectional study, 154 Information Technology with at least 1 year of experience were recruited using convenience sampling technique. After obtaining Informed consent, Data regarding Personal characteristics, Computer Usage and Knowledge of Ergonomics were collected by face to face interview method using a valid, reliable and pretested Questionnaire. The Ergonomic awareness section of the Questionnaire composed of 35 items related to Knowledge about Musculoskeletal disorders and its risk factors, Working Postures, Seating, Keyboard/Mouse, Monitor, Table and Accessories and finally Rest breaks and Exercises.

Results: Majority of the subjects are unaware of Cumulative Trauma Disorders (7% - Correct responses), Goals of Ergonomics (25% - Correct responses), Sign & Symptoms (35% - Correct responses) & Risk factors (30% - Correct responses) of MSDs. With respect to Working Postures, Majority were unaware of Healthy Postures related to Elbow (25% - Correct responses) and Feet (47% - Correct responses). Majority of the subjects are aware of Correct Position (87% - Correct responses) & Distance (90% - Correct responses) of Monitor Placement. 52% of the subjects are unaware of the Use and Placement of Document holder and 61% of the subjects are unaware of Mini breaks.

Conclusion: This study highlighted the awareness of ergonomics among Information Technology professionals and emphasize the need for ergonomic training programme to promote the awareness about Musculoskeletal disorders and the healthy postures.

Keywords: Information Technology Professionals, Ergonomics, Awareness.
INTRODUCTION

Ergonomics is the scientific study of human work. The objective of ergonomics is to obtain an effective match between the user and work station to improve working efficiency, health, safety, comfort and easiness to use. Neglect of ergonomic principles results in inefficiency and pain in the workplace. An ergonomically deficient workplace may not cause immediate pain, because the human body has a great capacity for adapting to a poorly designed workplace or structured job. However, in time, the compounding effect of job and/or workplace deficiencies will surpass the body’s coping mechanisms, causing the inevitable physical symptoms, emotional stress, low productivity, and poor quality of work. These problems if ignored can prove debilitating and can cause crippling injuries forcing one to change one’s profession.

In every sphere of life the dependence on computers is ever increasing and this widespread use has led to some important “user” health concerns. In the absence of a good ergonomic design, extended work for prolonged periods can adversely lead to musculoskeletal disorders (MSDs). Globally, the number of people suffering from musculoskeletal conditions has increased by 25% over the past decade and these conditions make up 2% of the global disease burden. Ergonomics emerges as an issue since many of these musculoskeletal conditions are common computer related injuries. The risks include both improper workstation design and faulty posture as prolonged sitting for extended periods leads to poor circulation, stiffness of joints and pain. Extended hours of continuous work can increase the chance of developing an injury and repetitive strain injuries that develop over time may lead to long-term disability. A little knowledge of the principles of ergonomics of work station setup and exercises can prevent a lot of discomfort and maximize productivity.

Ergonomics is a relatively new concept in India yet to be considered an essential component of most enterprises. In the absence of any formal education/orientation on ergonomics, the present study, first of its kind in India, aims at identifying the Knowledge of ergonomics among Information Technology professionals working in Karnataka. The findings of this study can form a building block for future research and ergonomic training in the Information Technology sector.

MATERIALS AND METHODS

In this Cross-sectional study, 154 Information Technology professionals working in Karnataka satisfying the selection criteria were recruited using convenience sampling technique. Subjects working on computer for a
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minimum of 20 hours/week and have completed 1 year of experience were selected for the study. After obtaining Informed consent, Data regarding Personal characteristics, Computer Usage and awareness of Ergonomics were collected by face to face interview method using a valid, reliable and pretested Questionnaire. The Ergonomic awareness section of the Questionnaire composed of 35 items related to Knowledge about Musculoskeletal disorders and its risk factors, Working Postures, Seating, Keyboard/Mouse, Monitor, Table and Accessories and finally Rest breaks and Exercises. The study was approved by Yenepoya University Ethics Committee.

Statistical analysis

Descriptive statistics was produced for Personal characteristics and Computer usage. The distribution of responses to the items related to Ergonomic knowledge was presented by percentage of the subjects who answered correctly.

RESULTS

Table 1 show the details regarding Personal characteristics of the 154 subjects participated in this study. Among the subjects majority (87.7%) of them belong to 20-29 age group. Most of the subjects were males (76%), unmarried (79.9%) and under graduates (46.1%). 66.9% of the subjects were normal in Body mass index (BMI) and 14.9% and 2% of the subjects were overweight and obese respectively. Table 2 lists the details regarding the computer usage of the participants. The average experience of the subjects was 3.3 years. The average daily and weekly computer usages were reported as 7.7 hours and 43.7 hours respectively. The average daily keying and mouse usages were reported as 5.1 hours and 4.9 hours respectively.
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The distribution of responses to the items was presented by percentage of the subjects who answered correctly. The results are presented under 7 sections as shown in Figure 1 – 7. The scores are highlighted in red, if more than 50% of the subjects fail to answer correctly.

The result of this study show that majority of the subjects are unaware of Cumulative Trauma Disorders (7% – Correct responses), Goals of Ergonomics (25% – Correct responses), Sign & Symptoms (35% – Correct responses) & Risk factors (30% – Correct responses) of MSDs (Figure 1). With respect to Working Postures, Majority were unaware of Healthy Postures related to Elbow (25% – Correct responses) and Feet (47% – Correct responses) as shown in Figure 2. Majority of the subjects are aware of Correct Position (87% – Correct responses) & Distance (90% – Correct responses) of Monitor Placement (Figure 5). 52% of the subjects are unaware of the Use and Placement of Document holder and 61% of the subjects are unaware of Mini breaks as shown in Figure 6 and 7 respectively.

DISCUSSION

This is the first study in India to assess the knowledge of ergonomics among Information technology professionals. The results of this study show that majority of the subjects were unaware of ergonomics and its goals, cumulative trauma disorders, signs & symptoms and risk factors of MSDs. This finding differs from that of Robertson MM and O’Neill MJ, who found that subjects of their study (U.S.A) showed a high level of awareness of the risk factors associated with MSDs. The authors believe that the increased awareness
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among their subjects is the reflection of the general public’s awareness of ergonomics and computer work.

To understand the best way to set up a computer workstation, it is important to understand the concept of neutral body positioning. This is a comfortable working posture in which joints are naturally aligned. Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a MSD. Majority of the subjects in this study were able to correctly answer items related to postures of head, neck & trunk, wrist & hand and thigh. However, there was a lack of awareness about the elbow and feet postures. Majority of the subjects were able to correctly answer the items related to the knowledge regarding seating, key board/mouse, monitor and table and accessories. With regard to breaks and exercises, majority of the subjects were able to correctly answer the items related to micro breaks, periodically alternating computer tasks, stretching and eye exercises. However, there was a lack of awareness about the mini breaks.

There is an immense need to create ergonomics awareness among all stakeholders such as employers, employees, law makers and general public. Ergonomics needs to be included in educational curricula at all levels of school, university and technical education. Public awareness about signs and symptoms and dangers of WRMSDs caused by poor ergonomic setup and practice should be created through mass media. There is urgent need to change the mindset of workers and employers through ergonomics education. Ergonomic training programs should be organized at the workplaces. Involvement of Governmental and nongovernmental agencies, professional organizations and employer associations should be sought in these efforts.

CONCLUSION

This study highlighted the awareness of ergonomics among Information technology professionals in Karnataka, India. Majority of the subjects were unaware of cumulative trauma disorders, ergonomics and its goals, signs & symptoms and risk factors for musculoskeletal disorders. The findings of this study emphasize a need for Ergonomic Training for the workers to promote the awareness about Musculoskeletal disorders and healthy postures and develop a positive attitude towards the importance of Ergonomic Computer Workstation Setup and Exercises. Students are the future workers and they are more likely to enter the work force with poor computing habits or even a Musculoskeletal disorder without some intervention. Hence it is the need of the hour to include Ergonomic Training Programme in educational curricula at all levels of school, university and technical education and prepare them to enter the work force and excel in their chosen professions.

CONFLICTS OF INTEREST

None declared

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