International Journal of Health Sciences and Research
Volume 14; Issue: 12; December 2024
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Knowledge, Attitude and Beliefs of Ergonomics in Information Technology (IT) Professionals

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DOI: https://doi.org/10.52403/ijhsr.20241204

ABSTRACT

Background: Professionals working in the Information Technology (IT) face high risk of musculoskeletal disorders (MSDs) due to work habits. Understanding their knowledge, attitude and beliefs about ergonomics helps design effective interventions, address misconceptions, and build collaboration for better individual and workplace well-being. This may ultimately improve their health, comfort, and productivity. The aim of the study was to find knowledge, attitude, and beliefs of ergonomics in IT professionals.
Methods: An observational study was conducted among 152 participants from IT companies of Ahmedabad, using convenience sampling. The mean age was (27.98±6.84) years including 110(72.4%) males and 42(27.6%) females. A google form was generated to collect the data of name, age, gender, years of experience, hours of work, education and medical conditions were asked. They were asked to complete a self-reported questionnaire about knowledge, attitude, and beliefs about ergonomics. Descriptive analysis was done using Microsoft Excel.
Results And Conclusion: 9.2% people have received formal ergonomic training. 28.2% people has back pain.78.3% people know that chair position can affect their posture while 71.1% people know that working in an uncomfortable position can make them feel fatigue.73.7% people have adjusted their chair and table position according to their height.72.4% people take postural breaks if they must sit for long. 94.1% people believe that incorrect way of sitting can cause pain.93.4% people believe that being in same position for long time can cause pain and discomfort. Ergonomic training is lacking, but awareness is good. Attitude and beliefs are positive towards ergonomic changes.

Keywords: Ergonomics, Information Technology (IT), Knowledge, Attitude and Beliefs (KAB)

INTRODUCTION

Ergonomics defined as the science of fitting a workplace to the user's needs, aims to increase efficiency and productivity and reduce discomfort. The main aim of ergonomics is to adapt the work to the person and vice versa.(1) Occupational Safety and Health Administration defines ergonomics as: "the science of (adapting workstations, tools, equipment and also job techniques to be compatible with human anatomy and physiology to reduce the risk of musculoskeletal disorder injuries due to ergonomic stressors". (2)

Many jobs are associated with the development of musculoskeletal problems

due to varied reasons. The most common job producing these types of strains is that which uses computers every day for their work. Since the establishment of IT industries in India, there has been an enormous growth in that field.[3] Knowledge of ergonomics is a must in today's world, when the job of an information technology (IT) professional is to sit in front of a computer screen for long periods of time. Working in an ergonomically deficient environment for an extended amount of time can result in musculoskeletal disorders (MSDs).

Musculoskeletal disorders (MSDs) are a common concern among office employees. Due to varied reasons in their work like prolonged sitting and postural demands, the software engineers develop musculoskeletal problems.[4] These disorders affect the muscles, tendons, ligaments, nerves, and other soft tissues, causing pain, discomfort, and reduced functionality. Office employees are particularly susceptible to MSDs due to prolonged sitting, repetitive movements, poor posture, and inadequate ergonomic setup, improper office lighting and intense typing without resting periods.[5] Examples of MSDs include carpal tunnel syndrome, tendonitis, sciatica, herniated disc, cervical pain, shoulder and lower back pain. MSDs are one of the most significant problems in the workplace today.[6]

Research has shown that ergonomics training and environmental intervention decrease the incidence of musculoskeletal disorders. Businesses that have implemented ergonomics programs report significant decreases in accidents, injuries, illnesses, and healthcare costs over time, along with increases in productivity, quality of work, and worker morale.[6] This may ultimately improve their health, comfort, and productivity.Understanding knowledge, attitude, and beliefs about ergonomics among IT professionals, helps design effective interventions, address misconceptions, and build collaboration for better individual and workplace well-being. Knowledge and practice of ergonomics can help to overcome all these difficulties and enhance anticipated outcomes and improve the work efficiency of workers. The aim of the study was to assess the knowledge, attitude, and beliefs of ergonomics in Information Technology (IT) professionals.

MATERIALS AND METHODS

An observational study using convenience sampling was conducted at IT companies in Ahmadabad. Data collection was conducted through a Google Form. 152 participants working in the IT field since at least 1 year were included in the study. People unwilling to participate were excluded. The study was conducted according to the ethical principles of the Declaration of Helsinki and there was no risk to the participant. Participants were explained the study and consent to participate was obtained. Participants unwilling to participate were excluded.

A Google form was generated and shared among the participants to collect the data. Participants' name, age, gender, years of experience, hours of work, education and known medical conditions were asked. They were asked to complete a self-reported questionnaire about knowledge, attitude, and beliefs about ergonomics. The questionnaire consisted of 12 questions: 5 on knowledge about ergonomics, 4 on attitudes towards ergonomics, and 3 on beliefs about ergonomics.

STATISTICAL ANALYSIS

Data analysis was done using descriptive statistics in Microsoft Excel 2022.

RESULT

One hundred and fifty-two participants with a mean age of (27.98 ± 6.84) years participated in this study including 110 males (72.4%) and 42 females (27.6%). Table 1 shows the participants' characteristics. It was noted that 40.3% of the participants were less than 25 years old, 54.6% were between 25-39 years old, 4.3% were between 40-49 years and 0.8% were 50 years or older. Of the participants, 72.4%

were male, and 27.6% were female. In that 32.9% were graduates, 51.3% had a postgraduate degree, 6.6% had a diploma and 9.2% had other education. As for the work experience, 59.2% of the participants had less than 5 years of experience, 26.3% had between 6 and 10 years, 5.9% had between 11 and 15 years and 8.9% had more than 15 years. Additionally, in participant hours of working, 2.6% had less than 5 hours, 11.2% had 5-7 hours and 86.2% had more than 7 hrs of work.

Variable		**N (152)**	**%**
Age(year)	<25	58	40.3
	25-39	83	54.6
	40-49	9	4.3
	>50	2	0.8
Gender	Male	110	72.4
	Female	42	27.6
Education	Undergraduate	50	32.9
	Postgraduate	78	51.3
	Diploma	10	6.6
	Other	14	9.2
Years of Working	Less than 5 years	90	59.2
	6-10 years	40	26.3
	11-15 years	9	5.9
	More than 15 years	13	8.9
Hours of working	<5 hrs	4	2.6
	5-7 hrs	17	11.2
	>7 hrs	131	86.2

Table 1: Demographic Characteristics of the Participants

No.	**Questions**	**Yes**	**No**
KNOWLEDGE			
1.	Are you familiar with the term "ergonomic (postural care and adjustment)"?	43.7%	56.6%
2.	Have you received any formal training or guidance on ergonomics?	9.2%	90.8%
3.	Do you know that chair position can affect your posture?	78.1%	21.9%
4.	Do you know that incorrect eye position while looking/facing the computer can result into fatigue, sore neck, and headache?	66.9%	33.1%
5.	Do you know that working in an uncomfortable body position can make you feel fatigued and lethargic?	71.5%	28.5%
ATTITUDE			
1.	Do you perform any stretching or mobility exercises at regular intervals at work?	35.8%	64.2%
2.	Have you adjusted your chair and table position according to your height?	74.2%	25.8%
3.	Do you take postural breaks (e.g. walking) in between if you must sit for long?	72.2%	27.8%
4.	Do you take visual breaks in between if you must sit for long?	59.6%	40.4%
BELIEFS			
1.	Do you believe that ergonomic changes can affect your efficiency?	83.4%	16.6%
2.	Do you believe that an incorrect way of sitting can cause back pain?	94%	6%
3.	Do you believe that being in same position for long time can cause pain and discomfort?	93.4%	6.60%

Table 2: The responses to the questionnaire

Table 2 shows the percentage of responses to the questionnaire. 9.2% people had received formal ergonomic training. 28.2% of people had back pain 78.3% of people know that chair position can affect their posture while 71.1% know that working in an uncomfortable position can make them feel fatigued.

35.8% of people performed stretching or mobility exercises at regular intervals at work. 73.7% have adjusted their chair and table position according to their height. 72.4% take postural breaks in between if they must sit for long.

83.4% people believe that ergonomic changes can affect their efficiency. 94.1% people believe that an incorrect way of sitting can cause back pain. 93.4% people believe that being in same position for long time can cause pain and discomfort.

DISCUSSION

The purpose of the study was to find knowledge, attitude, and beliefs of ergonomics in Information Technology (IT) Professionals. The results of this study show that most participants were aware of ergonomics and its goals, signs & symptoms, and risk factors of MSDs, took postural breaks, adjusted their position, and believed that ergonomic changes can affect their efficiency.

Only 9.2% people had received formal ergonomic training. Dugar NM et al said that it is the need of the hour to educate and inculcate ergonomic practice among IT professionals to avoid prolonged discomfort which leads to different MSDs, cumulative trauma, and other injuries.[6] Demissie B et al conducted a study in South Gondar where they found that respondents who did not undergo ergonomics training had a 5.4- and 3.8-times higher chance of developing MSDs than those who did, respectively. Untrained individuals may lack the essential skills and information required to implement practical precautions against occupational musculoskeletal disorders, and as a result, they may fail to follow established protocols and work practices.[7,8] The present study did not assess the prevalence or chance of MSD.

Fatima B et. al found that more than half of the office employees are well-aware with knowledge of laptop practice but still not all of them practice ergonomics while using laptops for prolonged periods. [9] Jasmine M et al found that more than 50% IT professionals had knowledge about ergonomic principles of keyboard, mouse, monitor height and stretching in between the work. [4] The present study also found similar results.

In the present study 35.8% performed some type of stretching or mobility exercises at regular intervals at work. Demissie B et al found that musculoskeletal discomfort was greatly reduced by combining ergonomic training and exercises.[8] In the present study 78.3% people know that chair position can affect their posture while 71.1% people know that working in an uncomfortable position can made them feel fatigue. Poniran H et al found that workstation design has an impact on computer ergonomic hazards. This signifies that inappropriate design, poor computer facilities, repetitive work, and close distance of the monitor screen cause ergonomic hazards such as shoulder and neck pain, musculoskeletal disorder problems, and body posture.[10]

In this study, we found that 72.4% of people take postural breaks if they must sit for long. Fatima et al found that 135 (69.2%) people who used laptops for about 6-10 hours daily and 129 (66.1%) employees took rest for 10-15 minutes average.[9] 59.6 % of people take visual breaks in between if they must sit for long. Sirajudeen MS et al. found that only 34.4% of participants were aware about mini breaks.[11] Khatri A and Kharel R found significantly reduced eye symptoms on taking rest breaks, frequent blinking, and lower computer screen levels during computer use. [12] Sirajudeen MS et al. found that subjects knowledge regarding breaks and exercises, such as periodically alternating computer tasks, stretching, and eye exercises. However, there was a lack of awareness about mini-breaks.[13]

94.1% people believe that an incorrect way of sitting can cause back pain. 93.4% people believe that being in same position for long time can cause pain and discomfort. These findings are similar to previous studies which showed a level of awareness of the risk factors was associated with MSDs. [10] Individuals with a better understanding of computer workstation ergonomics demonstrated a reduced likelihood of experiencing moderate/severe MS pain.

The present study did not assess the prevalence or risk of MSDs in IT professionals. Ergonomic training programs should be organized at the workplaces. Involvement of Government and nongovernment agencies, professional organizations and employer associations should be sought in these efforts. Future studies to see the effect of incorporating

physical activities into the daily routine can be done.

CONCLUSION

Ergonomic training is lacking in IT professionals, but the awareness of ergonomics is good. Attitude and beliefs are positive towards ergonomic changes amongst IT professionals.

Declaration by Authors

Ethical Approval: According to the ethical principles of the Declaration of Helsinki.

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Khushi Shah, Jahanvi Patel, Megha Sheth. Knowledge, attitude and beliefs of ergonomics in information technology (IT) professionals. *Int J Health Sci Res.* 2024; 14(12):37-41. DOI: *10.52403/ijhsr.20241204*

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