

Ergonomics for the Prevention of Musculoskeletal Disorders of Computer Users in Hong Kong, Singapore and Japan

Justine MY Chim*

Chim's Ergonomics and Safety Limited, 15/F, No. 80 Gloucester Road, Wan Chai, Hong Kong, China

Abstract

Healthy computing has been a popular topic in the office health and safety domain. Some countries developed specific legislation to protect the prolonged computer users in the workplace. This paper aims to summarize the research results on the legislative requirements and guidelines on office ergonomics practices in Hong Kong, Singapore and Tokyo, Japan. In regards to the legislative aspects on office ergonomics, among three countries, only Hong Kong implemented a specific occupational health and safety legislation for protecting the computer users. Other two countries published code of practices and guidelines to suggest the company internal control methodology on office ergonomics. This paper also proposed the FITS model office ergonomics program aims to effectively manage the potential risks of musculoskeletal disorders in computer users. The solution to implement the office ergonomics program is also provided.

Keywords: Office ergonomics; Computer users; Musculoskeletal disorders; Ergonomics program; Asia

Introduction

Working at a computer often involves sitting in one position for long hours and requires repetitive motions. Proper workstation setup, suitable furniture, regular rest breaks and stretching exercises can increase muscle flexibility, reduce the risk of injury, and address muscular imbalances.

Using computer for work became necessary in the day to day office activities. Researchers suggest that 93% of workers in the United States use a computer for over four hours a day [1]. A survey was conducted by the Occupational Safety and Health Council in Hong Kong ("OSHC") in 2002 which 48% of 368 survey respondents spent at least four hours for using computer in a day at work. Office employees reported multiple sources of physical discomfort in relation to computing work and the neck (62.5%), eyes (61.7%) and shoulders (60.1%) were top three reported regions of discomfort [2].

According to a recent survey in Hong Kong, over 80% of surveyed office computer users reported musculoskeletal symptoms in at least one body region and over 40% of 618 surveyed office employees received treatment due to their work-related musculoskeletal symptoms [3]. In another study in which the self-administered questionnaires were collected from 621 office workers in Beijing, China, the result showed that the 12-month prevalence rate of work-related musculoskeletal disorders related to the back region was 55.5% [4].

A survey study by the Singapore General Hospital in 2004 showed that 70% of working adults suffered from back, shoulder and/or neck pain in Singapore. The negative effect of poor physical health conditions in the workplace can predict business losses due to decreased productivity and increased absenteeism as well as health care costs [5].

Another survey study was conducted in Japan, the result concluding that among 3,070 administrative office workers and computer users, 19.1% reported upper extremity pain, 17% reported eyestrain and 11.6% reported back pain. It also proved that duration of daily hours of using a computer and lack of breaks and rest are highly related to eyestrain, musculoskeletal discomfort and psychological distress [6].

Objectives

The aim of this paper is to summarize the research results on the

legislative requirements and guidelines on office ergonomics practices in Hong Kong, Singapore and Tokyo, Japan. In this initial review, Hong Kong, Singapore and Tokyo, Japan were selected because from the author's business experience in office ergonomics consultancy service in Asia, these three countries are mostly requested for office ergonomics program among in Asia. The best practices of office ergonomics program and the implementation of regional program for protecting the health and safety of the display screen equipment for users at work will be included.

Legislative Aspects of Office Ergonomics

Hong Kong

The Occupational Safety and Health Ordinance (Cap 509) ("the OSH Ordinance") came into effect in May 1997 and it regulates safety and health at work of all economic activities which include both industrial and non-industrial organizations. The scope of the OSH Ordinance has been expanded to cover offices, commercial premises, educational institutions, clinics, laboratories and other workplaces.

In July 2003, the Occupational Safety and Health (Display Screen Equipment) Regulation ("the DSE Regulation") came into effect and the DSE Regulation aims at protecting the safety and health of employees who use display screen equipment at work for prolonged periods of time.

In the same month, the "Code of Practice for Working with Display Screen Equipment" ("the Code of Practice") was published by the Commission of Labour, Occupational Safety and Health Branch, Labour Department according to Section 40 of the Ordinance (Cap 509) with the purpose of providing the person responsible for a workplace

*Corresponding author: Justine MY Chim, Chim's Ergonomics and Safety Limited, 15/F, No. 80 Gloucester Road, Wan Chai, Hong Kong, China, Tel.: +852 3625 2024; Fax: +852 3487 1975; E-mail: jchim@my-ergonomics.com

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and employees practical guidance. It contains the definition of “user” in the DSE Regulation and the requirements regarding compliance with the DSE Regulation.

In the Code of Practice, an employee is defined as “user” (i.e. prolonged computer user) if by the nature of work is required to use display screen equipment almost every day; and (a) continuously for at least 4 hours during a day; or (b) cumulatively for at least 6 hours during a day. In calculating the hours of working with display screen equipment, any breaks not exceeding 10 minutes in an hour away from the display screen equipment shall not be regarded as breaking the continuity of use of the display screen equipment [7].

Main provisions of the regulation include

Workstation risk assessment: The Workstation Risk Assessment includes the process of hazard identification and risk assessment of the health and safety risks of the users of a computer workstation. In addition, the Risk Assessment is also included in the review of the existing precautions to determine whether the measures are adequate or not. A proper record of findings should be included in the Workstation Risk Assessment exercise. The responsible person shall take steps to reduce any risk identified in a risk assessment to the lowest extent as is reasonably practicable [8].

Safety and health training: An employer shall, so far as is reasonably practicable, ensure that a user employed by him is provided with necessary safety and health training in the use of workstations [8].

User’s conformity to the safe system of work: The user should cooperate with the responsible person in conducting the risk assessment as well as implementing preventive and remedial measures to reduce identified risks in the workplace setting. The user is also responsible for notifying the responsible person of any problem relating to the DSE work task [9].

Singapore

The Occupational Safety and Health Division of the Ministry of Manpower (MOM) is responsible for occupational health and safety in Singapore. Codes of practice, guidelines and information have been developed to provide good occupational practices for ergonomics in office environments. The Guidelines on Office Ergonomics was published by MOM in 2001. The purpose of the guidelines is to provide guidance on promoting good occupational health practices in office settings. In 2005, SPRING (“The Standard, Productivity and Innovation Board”) Singapore issued the Code of Practice for Office Ergonomics (SS 514:2005). Currently, there is no specific health and safety legislation applicable to office ergonomics [10].

The Code of Practice for Office Ergonomics [10] covers:

- The design and layout of workstations and equipment including the height of tables, chairs and computers for office use
- The correct sitting postures and manual handling in the office setting
- The recommendations for the design and improvement of work situations to make them more comfortable and productive
- The work environment concerns in the office, including: lighting, noise and indoor air quality
- The checklist for conducting the preliminary audit which is used to identify the obvious ergonomics problems in offices

Tokyo, Japan

Japan’s Industrial Safety and Health Law and Related Regulations were enacted in 1972. A number of detailed guidelines were prepared which provide guidelines for employers to implement associated measures in compliance with the Industrial Safety and Health Law and Regulations.

The Japanese Ministry of Labour published guidelines for Visual Display Terminals (VDT): Guidelines for VDT Work in Labour Hygiene Tokyo: Roudoushou Kihatsu. No. 705 in 1984. In order to prevent fatigue and promote a comfortable workplace environment for VDT operations, the Labour and Welfare Department, Ministry of Health enacted the “Guidelines for Industrial Health Controls of VDT Operations” in 2002. The guidelines include countermeasures whereby employers should give assistance to VDT employees to reduce mental and physical fatigue and take actions to maintain workers’ health. Employers should take action on the reviews of working environment control, operational control and health control.

The National Institute of Industrial Health, Japan developed a manual: “Action Checkpoints for Comfortable Computer Work” which was established based on the results of a study on the ergonomics aspects related to the introduction of information technologies in modern offices, and also provide a guideline in a practical way. The manual has been developed targeting office employee who uses computer for prolonged period of time.

Best Practices of Office Ergonomics Program

Following the best practices of the office ergonomics program in the workplace not only aims to comply with the relevant legislative requirements, but also to avoid the development of musculoskeletal injuries or discomfort associated with working with computers at work and the potential workplace incidents. With effective implementation of the office ergonomics program, the workplace health and safety in an office setting and employees’ wellness will be enhanced.

Chim (2013) proposed FITS model office ergonomics program aims to effectively manage the potential risks of musculoskeletal disorders in computer users. It also aims to minimize the medical cost as well as sick leave cost while enhancing computer users’ health and safety. The FITS model office ergonomics program included four components of:

(1) F: Furniture Evaluation and Selection: Overall fitting of workstation furniture, chair and computer accessories should be consideration in the design of the workspace. The evaluation and selection includes the ergonomics task review, ergonomics assessment, users’ evaluation and employee-furniture-workstation fitting evaluation [11];

(2) I: Individual Workstation Assessment: The assessment comprises of analyzing the current workstation setting, furniture layout and adjustment as well as the other environmental factors such as illumination, noise and ventilation, and its interaction with the computer user. Completed assessment record should be prepared which highlights the findings of the assessment results, recommendations and follow-up records [11];

(3) T: Training and Education: Office Ergonomics Training should include the practical skills of workstation setup and work posture, tools and ways to modify workstations and proactive injury prevention [11]

(4) S: Stretching Exercises and Rest Breaks: Even keeping the proper working posture for long hours, it is still harmful to the body.

The body should be maintained movement throughout the day and perform stretching exercise can reduce stress and increase blood circulation and reduce potential muscle fatigue. Depending on the business operations, rest break is generally arranged in a formal break, such as meal break, or informal format, such as stretching break or walk away from workstation for a drink [11].

The FITS model office ergonomics program can be applied in any country and office setting and the program is a systematic way to promote office workers' health and safety.

Implementation of the Office Ergonomics Program

Although different legislative requirements are executed in different countries, a holistic office ergonomics program is suggested for the Asian region so it can minimize the cost of managing different programs in different locations.

For the office ergonomics program in a region, first, the company should appoint an external ergonomics consultant or internal ergonomist to lead the office ergonomics program. Given that the application of occupational ergonomics in Asia is relatively new and the body build of Asians is different from non-Asians, a local consultant or regional ergonomist can assist in program planning, developing, organizing, executing and reviewing of the program effectively. Second, the office ergonomics program can be incorporated into occupational health and safety or employee wellness programs. Third, an appointed office ergonomics coordinator in each region should be arranged to work with the local consultant or regional ergonomist. Fourth, the program should be regularly reviewed and the outcome monitored for the prevention of musculoskeletal complaints by office employees. Also, the physical wellness of office employees shall also be promoted.

Conclusion

The long hours using computers in an office setting are unpreventable. An effective office ergonomics program should be

tailor-made and promoted in the Asian region. Although the legislative requirements for the protection of office employees in Asian countries are not all the same, an effective office ergonomics program such as the FITS model office ergonomics can promote health and safety as well as reduce the associated cost due to work-related musculoskeletal injuries.

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