

CONTROLS FOR MUSCULOSKELETAL DISORDERS (MSDs) IN
CONSTRUCTION TRADES

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DEDICATION

Especially for

My beloved parents

Che Su Mat Esa and Shaari Zakaria,

“Your unrepayable love motivates me endlessly”.

My beloved sibling

Mohammad Syazwan Shaari and Mohammad Syazimie Shaari

Who give me moral supports and inspiration in your own way

Friends, supervisor,

Your encouragement makes me forget the meaning of being a quitter.

You know who you are.

May Allah have mercy on you and gives you blessing for the rest of your life.

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In the name of Allah S.W.T the most gracious and most merciful, with his permission Alhamdulillah this study has been completed. Praise to Prophet Muhammad S.A.W., His companions and to those on the oath as what He preached upon, might Allah Almighty keep us His blessing and tenders.

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ABSTRACT

Workers in the construction experience high rates of injuries and illnesses, including work-related musculoskeletal disorders. Unfortunately, little attention from construction industry toward the ergonomic risk, cause an ergonomics injury that leads to musculoskeletal disorders. The study was to find the most severe Ergonomic Risk Factors (ERFs) and to propose procedures to mitigate them. Three objective had been identified which is to study ergonomic risk factors (ERFs) in construction trades, to determine factors affecting ergonomic risk factors (ERFs), and to propose procedures to reduce musculoskeletal disorders (MSDs) in construction sites. Fifty four (54) sets of questionnaires survey was distributed to constructions workers. The questionnaire had been analysed using Microsoft Excel software for the reliability test result, percentage frequency distribution, relative risk matrix and Average Index (AI). Data then tabulated in table and illustrated in the form of charts. Results indicated that repetition and awkward posture were the highest risk of ERFs and concreter had the highest exposure to all ERFs. From the findings, latent error at management level and lack of control by management are the most factors affected ERFs and may lead to musculoskeletal disorders. Therefore, set a proper working time to the workers and giving the correct position and instruction for ergonomics are highly regarded procedures to reduce MSDs, coupled with ergonomic program such as hazard information and reporting, and training, for implementing ergonomic changes in order to controls musculoskeletal disorders among workers in the construction trades.

ABSTRAK

Pekerja di tapak pembinaan mengalami kadar kecederaan dan penyakit yang tinggi, ini termasuk kerja berkaitan gangguan muskuloskeletal. Malangnya, perhatian yang sedikit diberikan oleh industri pembinaan terhadap risiko ergonomik boleh menyebabkan kecederaan ergonomik dan seterusnya gangguan muskuloskeletal. Kajian ini adalah untuk mencari Faktor Risiko Ergonomik (ERFs) paling teruk dan mencadangkan prosedur untuk mengurangkannya. Tiga objektif telah dikenal pasti iaitu mengkaji faktor-faktor risiko ergonomik (ERFs) bagi setiap pekerjaan di tapak pembinaan, menentukan faktor yang mempengaruhi faktor-faktor risiko ergonomik (ERFs), dan mencadangkan prosedur untuk mengurangkan gangguan muskuloskeletal (MSDs) di tapak pembinaan. Lima puluh empat (54) set kajian soal selidik telah diedarkan kepada pekerja pembinaan. Soal selidik telah dianalisis dengan menggunakan perisian Microsoft Excel bagi mendapatkan keputusan ujian kebolehpercayaan, taburan kekerapan peratusan, relatif risiko matriks dan Purata Indeks (PI). Data kemudiannya diletakkan didalam jadual dan digambarkan dalam bentuk carta. Keputusan menunjukkan bahawa pengulangan dan postur janggal adalah risiko yang paling tinggi dalam ERFs dan pembancuh konkrit paling tinggi terdedah kepada semua ERFs. Dari hasil kajian, kesilapan di peringkat pengurusan dan kekurangan kawalan oleh pihak pengurusan adalah faktor yang paling memberi kesan kepada ERFs dan boleh membawa kepada gangguan muskuloskeletal. Oleh itu, menetapkan masa kerja yang sepatutnya kepada pekerja dan memberikan kedudukan dan arahan yang betul untuk ergonomik adalah prosedur yang paling tinggi untuk mengurangkan MSDs, ditambah pula dengan program ergonomik seperti maklumat bahaya dan laporan, dan latihan dapat mengurangkan gangguan muskuloskeletal di kalangan pekerja di tapak pembinaan.

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LIST OF ABBREVIATION

AI	Average Index
CIDB	Construction Industry Development Board
DOSH	Department of Occupational Safety and Health
ERF	Ergonomic Risk Factor
HAS	Health and Safety
HSE	Health, Safety and Environment
MSD	Musculoskeletal Disorder
NIOSH	National Institute of Occupational Safety and Health
OSHA	Department of Labor Occupational Safety and Health
UK	United Kingdom
USA	United State of America

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CHAPTER 1

BACKGROUND OF STUDY

1.1 Introduction

Construction industry is undeniably plays a fundamental role in the development of Malaysian economic. This industry have becomes an engine for economic growth and most of the resources are used for the development of a country. Department of Statistics, Malaysia Economic Report (2015), reported that the total value of construction work in the first quarter 2015 recorded a growth by 15.1% year on year to RM28.7 billion and is expected a sustain growth from this industry.

Since construction industry are developing and becoming more complex with time and cost constraints, this industry faces many occupational injuries as construction is always risky (Chong H.Y. & Low T.S. 2014). Relatively, the higher risks of construction are related to working condition and constant exposed to a variety of safety and health threat of construction workers.

Musculoskeletal disorders (MSDs) are a common health problem in the working population. This type of injuries can really affect the health of workers that

are exposed to the hazard for a long period of time. These injuries are caused from the ergonomic risk factor (ERFs) such as awkward postures, high force, repetitive motions, contact stress, static loading (lifting), segmental or whole body vibration and heat and cold cause, which related to the working conditions that expose the muscles, joints, tendons, ligaments, and nerves (OSHA 3125, 2000).

1.2 Problem Statement

Construction trades carry a particularly high risk of musculoskeletal disorders. Report from statistic information Department of Occupational Safety and Health (DOSH) Malaysia 2012, indicate a large number of personnel suffer occupational disease. These numbers are sharply increasing year by year as shown in Figure 1.1. Personnel suffer occupational diseases in year 2012 are 1792 personnel, increasing in seven years time with different of 1473 personnel from 319 personnel in year 2005. This increasing can be reviewed as there was a lack of attention from construction industry toward workers health safety. Most of safety precautions are focusing on safety concern.

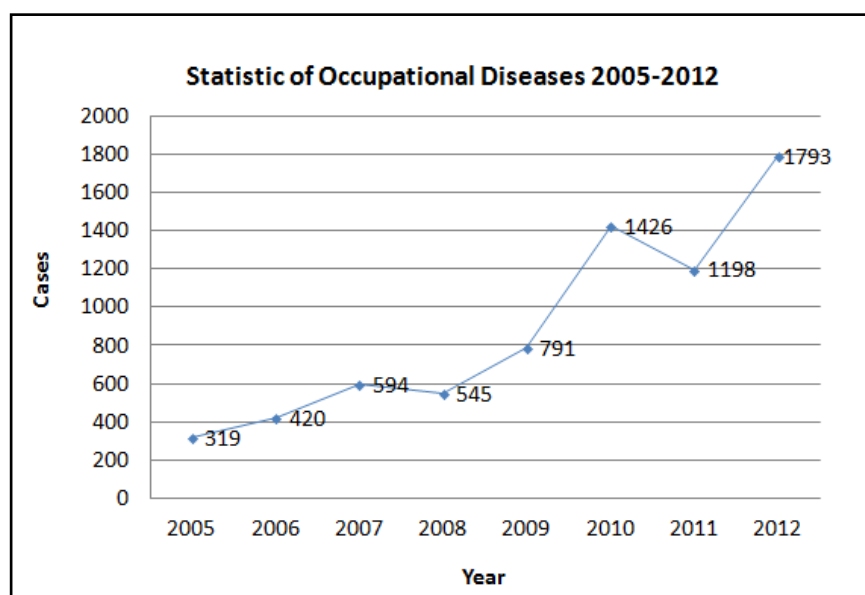


Figure 1.1: Statistic of Occupational Diseases 2005-2012 (DOSH, 2012)

Based on occupational statistic diseases in Figure 1.2, the top three ranks are Occupational Noise induce hearing loss by 956 cases, Occupational Lung disease by 111 cases, and Occupational Musculoskeletal disorders (MSDs) by 95 numbers of cases reported by Department of Occupational Safety and Health (DOSH) Malaysia (2012). This shows that MSDs among the largest contributors in the count of cases of workers health.

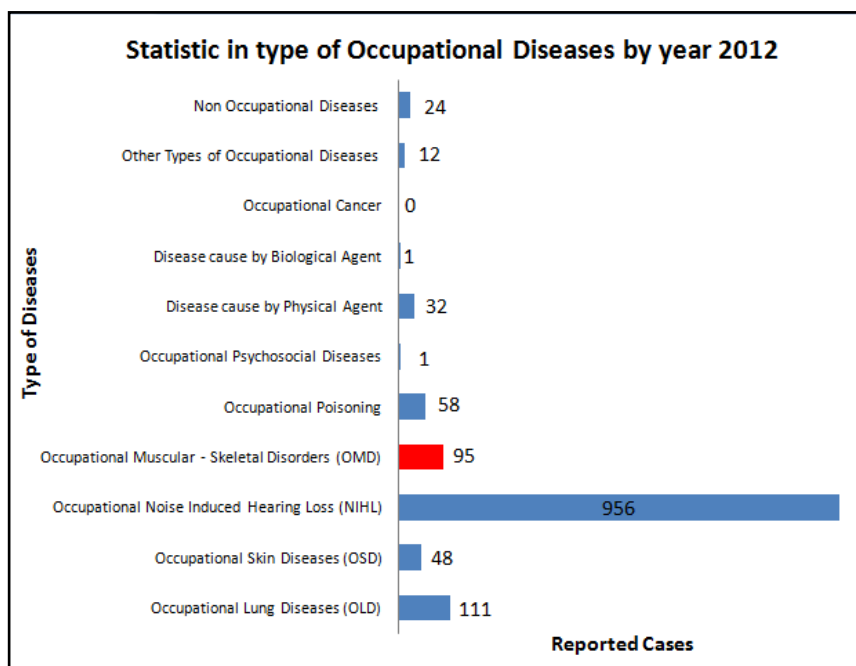


Figure 1.2: Statistic in type of Occupational Diseases by year 2012 (DOSH, 2012)

Figure 1.3 below show the statistic based on musculoskeletal disorder (MSDs) among workers had increases from year to year and had the highest result in year 2009 by 161 cases as shown in annual report of Malaysia Social Security Organization (SOCSSO) 1995-2009. Hence, MSDs have become serious injuries as the rate of occupational diseases that comprises musculoskeletal injuries at the workplace was greatly increased from year to year. These rapid increases makes the industries suffer from tangible and intangible losses because of increased in medication costs, decreased productivity, work quality and decreased worker morale (Linda A. M. et al., 2003).

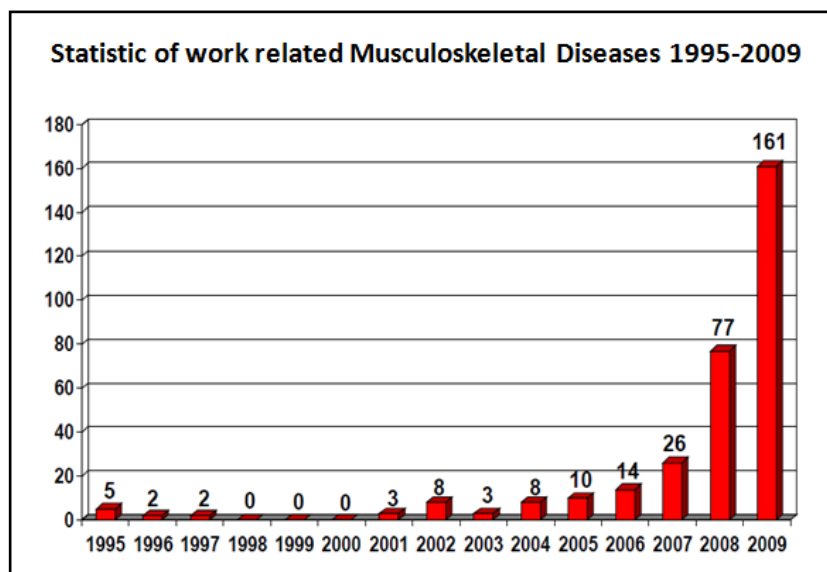


Figure 1.3: Statistic of work related Musculoskeletal Diseases 1995-2009 (SOCSO, 2009)

Not to mention the number of cases that gone unreported, by means the number of musculoskeletal disorder cases could be higher. Chairman of National Institute of Occupational Safety and Health (NIOSH), Tan Sri Lee Lam Thye added due to Malaysia moving towards industrialisation and the rising average age, MSDs symptoms are on the rise (DOSH, 2013). These rapid increases continue to be a major source of disability, lost of working time, and also linked to serious and costly health risks (Thoms M. C., John C. R. and Chris L. Z., 1996).

Nevertheless construction industry are much favours in the issue of high-profile and easy to handle and solvable such a safety issue. There is less emphasis on the health issues due to the nature of construction work, such as sizeable, temporary and mobile workforce, many impermanent workers which not directly employed lack of health experts within the industry, benefits of health management are not immediate and are consequently difficult to demonstrate (Gibb et al., 1999). Even thought National Institute for Occupational Safety and Health (NIOSH) had provided technique assistance for employers and workers to evaluate and address musculoskeletal disorder concern since 1997 (NIOSH, 1997), yet musculoskeletal disorders injuries at the workplace keep on increasing..

1.3 Aim and Objectives of Study

The aim of this study is to study the ergonomic risk factors (ERFs) in construction trade by determine the factor affecting ergonomic risk factor (ERFs) in order to propose ways to reduce the musculoskeletal disorders (MSDs) in construction sites. To achieve the above aims, following objectives have been laid out:

1. To study ergonomic risk factors (ERFs) in construction trades.
2. To determine factors affecting ergonomic risk factors (ERFs).
3. To propose procedures to reduce musculoskeletal disorders (MSDs) in construction sites.

1.4 Scope of Study

First of all, this research will study the ergonomic risk factors (ERFs) on construction sites along with determine the factors affecting ergonomic risk factors (ERFs) in construction trades. Then, this research will propose the suitable preventing ways in incorporating ergonomics to the acceptable level in order to reduce musculoskeletal diseases (MSDs).

Throughout the entire process of this research, the target respondents include all participants involved in the construction project mainly, those respondents are general workers, safety officer and safety supervisor.

This study will be conducted on the construction site in the state of Johor Bahru, Malaysia. The respondents will be randomly chosen to responds to the

interviews and questioners. Perspectives from each of construction respondents are very important as their decision and perspectives will determine the ergonomic risk factor, factors effecting ergonomics risk factor among the construction players and ways to reduce musculoskeletal diseases (MSDs) in construction trades

1.5 Significance of Study

Musculoskeletal disorders (MSDs) are an important issue that stakeholders within construction industry needs to be aware of, and understands as clear as possible. This study is presumed to bear the significance in controlling the musculoskeletal disorders (MSDs) among workers in the construction trades.

The idea for doing this study is by identifies ergonomic risk factor (ERFs) that are causing construction hazards. Wider perspective will be view in and investigation towards identify the cause or factors that are affecting ergonomic risk factor (ERFs) in construction trades. The result from identifying the ergonomic risk factor (ERFs) will be analysed and recommendations on ways to reduce musculoskeletal disorders (MSDs) on construction trades will be track down.

The outcomes of the study is expected to provide information to avoid or reduce musculoskeletal disorders (MSDs) in construction trades, thus improving the working conditions in the construction industry to a status of safe industry and become a good practice of project management as an effort to avoid common injuries that are related to poor ergonomics practise.

1.6 Arrangement of Report

The research methodology is a guideline for research to be completed in a systematic way towards achieves the research objectives. In this study, the research process generally consisted of five stages. The first phase involves on the background of the study and it comprises of introduction, problem statement, aim and objectives, scope of study, research significant, and research methodology.

Second phase is followed by exploratory research of the literature reviews on related topic for this study. Mainly the literature reviews are from previous study, books, journal, articles, magazine and internet. The topics in this chapter include definition, history, management and impact of ergonomic risk factor (ERFs), musculoskeletal disorders (MSDs) and constructions trades.

The third phase is collecting secondary data. Questionnaire is developed using the information from literature review. Once confirmed, a survey will be carried out based on questionnaire and data received would be analysed.

The fourth phase is data analysis, interpretation and data arrangement. Data collected would be analysed through using various technique and methodologies appropriate with the information needed. Analysis and data interpretation in this chapter is carried out with regard to fulfil the objectives of the research.

The last phase of the research process mainly involved writing up discussion and recommendations for future research.

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