

LOW BACK PAIN MITIGATION METHOD IN CONSTRUCTION INDUSTRY

NORZARINA BINTI OTHMAN

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DEDICATION

Especially for

My beloved parents

Othman Bin Yamin & Sadiyah Binti Wanir,

“Your unrepayable love motivates me endlessly”.

My beloved husband

Muhamad Rizal Bin Hamzah,

Who give me moral supports and inspiration in your own way

My dear kids,

Amirul Haiqal Bin Muhamad Rizal

Irena Sofea Binti Muhamad Rizal

Irena Alisya Binti Muhamad Rizal

Who always been my backbone to keep motivated

Supervisor,

Associate Professor Aziruddin Ressang

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

Friends and supporter

You know who you are who always give support.

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

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ABSTRACT

Workers in construction industry are potentially exposed to injuries and illnesses, including musculoskeletal disorders (MSDs) in the workplace. The research is to study ergonomic risk factors (ERFs) that caused low back pain (LBP) and to proposed mitigation method to minimize low back pain (LBP). The ergonomic risk factors (ERFs) that caused low back pain (LBP) and ergonomic program were established from literature review and interviewing Safety Health Officer, Project Manager and Engineer. The questionnaire were prepared and distributed to Safety Health Officer, Project Manager and Engineer on construction company in Johor Bahru. The feedbacks from questionnaire were analyzed using HIRARC. The results shown that static posture, repetition and excessive force are medium risk factors. Hazards information and reporting, training on MSDs and ergonomic and management leadership and employee participation are important. To reduce the ergonomic risk factors (ERFs) that caused low back pain (LBP), management involvement is important.

ABSTRAK

Pekerja-pekerja di dalam industri pembinaan mempunyai potensi yang tinggi untuk terdedah kepada kecederaan dan penyakit, termasuk gangguan *muskuloskeletal* (MSD) di tempat kerja. Kajian ini dijalankan untuk mengenalpasti faktor-faktor risiko ergonomik yang menjadi punca kepada sakit belakang sekaligus mencadangkan kaedah pengawalan bagi tujuan mengatasinya. Kajian literatur dan sesi temuramah bersama Pegawai Keselamatan dan Kesihatan, Pengurus Projek dan Jurutera telah dijalankan bagi mendapatkan informasi berkaitan faktor-faktor risiko ergonomik yang menjadi punca kepada sakit belakang. Borang soal selidik yang disediakan telah diedarkan kepada Pegawai Keselamatan dan Kesihatan, Pengurus Projek dan Jurutera yang terlibat secara langsung dengan syarikat pembinaan di sekitar Johor Bahru. Seterusnya, maklum balas daripada borang soal selidik yang diedarkan telah dianalisis dengan menggunakan kaedah HIRARC. Justeru, keputusan menunjukkan bahawa postur statik, pengulangan dan tekanan yang berlebihan dikelaskan sebagai faktor risiko ergonomik sederhana. Maklumat dan laporan bahaya terhadap kemalangan, latihan gangguan *muskuloskeletal* (MSD) dan ergonomik serta penglibatan pekerja merupakan elemen penting yang perlu dipertimbangkan untuk mencegah faktor-faktor risiko ergonomik yang menjadi punca kepada sakit belakang. Langkah pencegahan yang terbaik yang perlu dititikberatkan dalam mengurangkan faktor risiko ergonomik yang menyebabkan sakit pinggang adalah dengan memberi perhatian kepada penglibatan pihak pengurusan secara menyeluruh.

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LIST OF ABBREVIATION

AI	Average Index
CIDB	Construction Industry Development Board
DOSH	Department of Occupational Safety and Health
SOCSSO	Social Security Organization
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
HIRARC	Hazard Identification Risk Assessment and Risk Control

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CHAPTER 1

BACKGROUND OF STUDY

1.1 Introduction

The construction industry listed as a major contributor to the economic development of the country. The importance of this industry can be clearly seen through its involvement in various industries particularly in Malaysia.

Growth in construction, services and manufacturing is expected to rise in the 11th Malaysia Plan (11MP) as a path to drive Malaysia towards developed nation by the year 2020. The construction sector is becoming increasingly due to the increasing demand for modern and efficient infrastructure, in line with the goal of developed countries. Based on the 11MP, the construction sector is projected to grow at a rate of 10.3 per cent, contributing RM327 billion or 5.5 per cent to the Gross Domestic Product (GDP) by 2020.

In the 10th Plan period, the construction sector recorded an average annual growth rate of 11.1 percent, supported by civil engineering which grew at 9.3 percent

per annum. It was followed by non-residential and residential sub-sector, each at an average rate of 16.5 per cent and 9.1 per cent.

During Malaysia's involvement in the construction industry, various technologies have been recovered as an effort to improve the quality of construction, shorten the construction time, saving construction costs and modernization construction methods.

However, the safety elements shall be considered and implemented in any construction project. Issues related to Musculoskeletal Disorders (MSDs) is one of the elements shall not be underestimated in every construction project because it is common health problems in the working population.

The injury is highly affect the health of workers who exposed to hazard for a long period of working time. These injuries are caused by Ergonomic Risk Factors (ERFs) such as awkward posture, high force, repetitive motions, contact stress, static loading (lifting), segmental or whole body vibration, heat and cold cause, which related to the working conditions that expose the muscles, joints, tendons, ligaments, and nerves (OSHA 3125, 1994).

1.2 Problem Statement

Musculoskeletal Disorders (MSDs) has been recorded as high risk hazards in construction industry. According to the statistical report released by Department of Occupational Safety and Health (DOSH) Malaysia, indicate a very high number of personnel who suffer from the occupational diseases. The increased numbers been recorded significantly every year since 2005, as shown in Figure 1.1. 3,002 numbers

of cases being recorded in 2014 as personnel suffering from occupational diseases and it is drastically increased from the previous ten years. 194 numbers of cases of personnel suffering from occupational diseases recorded in 2005. The gap numbers recorded for the ten years are shown that the cases of occupational diseases are drastically increased with 94%. Large numbers shown that the element of Musculoskeletal Disorders (MSDs) particularly in construction industry should not be underestimated and the increasing been reviewed as a lack of attention on personnel health safety in the industry where the most safety precautions are focusing on safety concern.

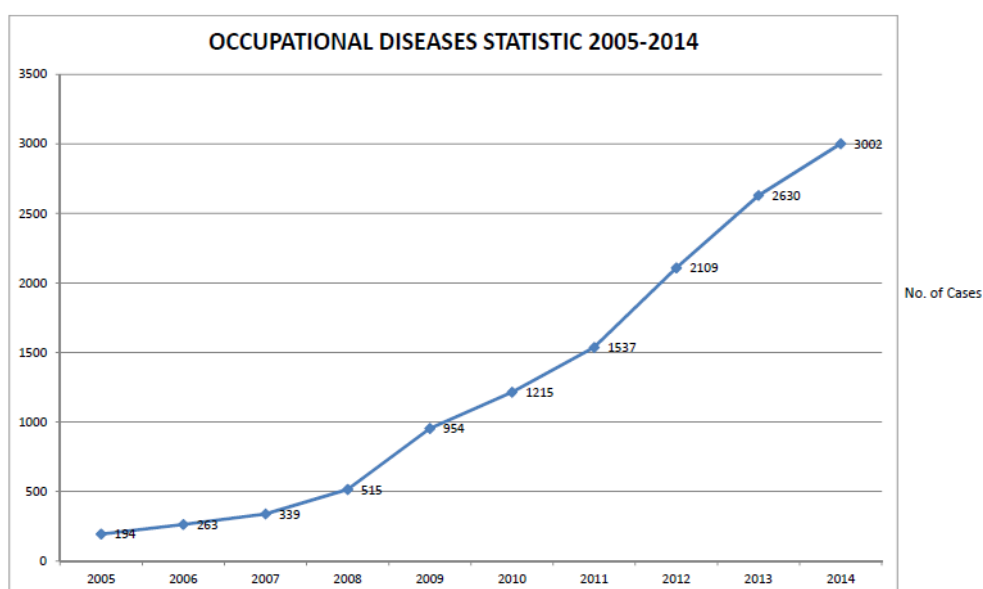


Figure 1.1: Statistic of Occupational Diseases 2005-2014 (DOSH, Malaysia)

Figure 1.2 shows the increasing number of cases on Musculoskeletal Disorder (MSDs) among workers from year 2005 to 2014 and 2014 being indicate as the highest number by 675 cases as shown in annual report of Malaysia Social Security Organization (SOCSO) 2005-2014. Musculoskeletal injuries at the workplace were greatly increased from year to year and MSDs have become serious in occupational injuries. 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).

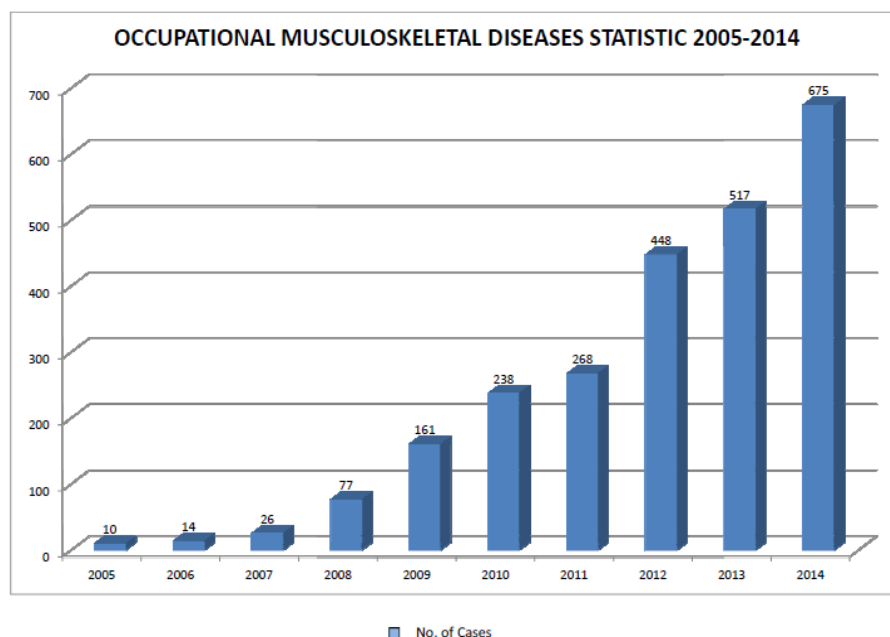


Figure 1.2: Statistic of Occupational Musculoskeletal Diseases 2005-2014
(SOCSO, Malaysia)

Chairman of National Institute of Occupational Safety and Health (NIOSH) Malaysia, Tan Sri Datuk Seri Panglima Lee Lam Thye added due to Malaysia moving towards industrialisation and the rising average age, MSDs symptoms are on the rise (DOSHS, 2013). These rapid increases continue to be a major source of disability, loss 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).

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 the occupational injuries related to musculoskeletal disorders keep on increasing.

1.3 Objectives of Study

The research is to study the factor affecting Ergonomic Risk Factors (ERFs) in order to propose mitigation method that can be used in practices to minimise Low Back Pain (LBP) in construction industry. Three (3) objectives are listed as the followings as a path to achieve the aims of the study.

1. To study Ergonomic Risk Factors (ERFs) in construction that causes Low Back Pain (LBP).
2. To study Ergonomic Program that is implemented in construction industry.
3. To propose mitigation method to reduce Low Back Pain (LBP).

1.4 Scope of Study

This research is to study on Ergonomic Risk Factors (ERFs) in construction industry besides to determine the factors affecting Ergonomic Risk Factors (ERFs) and to propose mitigation method that can be used in practices for minimizing Low Back Pain (LBP) disorders in construction industry.

For the purposes of this research, the method of questionnaire will be carried out and the scope of the study is focused on client, consultant, main contractor and sub-contractor who mainly involved on construction project.

Construction company in the state of Johor Bahru, Malaysia will be the target where the study being conducted. The respondents shall respond to the questionnaires and they will be randomly chosen.

The perspectives recorded from all selective respondents will determine the ergonomic risk factor, factors affecting ergonomics risk and mitigation method to reduce Low Back Pain disorders which affecting from Ergonomics Risk Factors (ERFs) in construction industry.

1.5 Significance of the Study

The awareness from stakeholders particularly in construction industry is needed and musculoskeletal disorders (MSDs) shall be taken as an important issue with clearly understandable. The study is to bear the significance in mitigating and controlling the musculoskeletal disorders (MSDs) among personnel in the construction industry.

The study will be arranged by identifies the ergonomic risk factor (ERFs) focusing on Low Back Pain injuries that are cause to hazards at workplace. Perspective view in this study will be identified by investigation towards the cause or factors that are affecting Ergonomic Risk Factor (ERFs) particularly in Low Back Pain injuries. The result from the study will analyse and to be recommended as mitigation method to reduce Low Back Pain injuries in construction industry.

The outcomes of the study is expected to provide information on mitigating action of Musculoskeletal Disorders (MSDs) and to proposed a method to reduce Low Back Pain injuries in construction industry, thus improving the working conditions in the construction industry as an effort to avoid common injuries that are related to poor ergonomics practise.

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