REDUCING MUSCULOSKELETAL DISORDERS (MSDs) BY MITIGATING ERGONOMICS RISK FACTORS ON CONSTRUCTION SITE

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DEDICATION

Mom and Sisters,

Your Endless Love and Pray Was Endless

Dad,

You're Dua' Shine to Me from Heaven

Hafizul,

You'll Always being my backbone

Friends,

Thank you for being my four leaf clovers that hard to find

and I'm lucky to have all of you

My Supervisor,

You Have Driven Me to the Truth That You Could

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ABSTRACT

Injuries have been recognized as serious issues on construction site. The aim of this research is to reduce Ergonomics Risk Factors (ERF) on construction site by mitigating ERFs on construction site. Literature review was carried out and questionnaire formulated and distributed on construction site around Johor Bahru. The data collected was analyzed by using HIRARCH. The result showed that performing motions constantly without short pause or break in between task, tools weight is too heavy and working by doing the same motion over and over again was being the high risk on construction site. Therefore, to reduce Musculoskeletal Disorders by having necessities of communication network at site, top management controls, preparing some training and education program, and also wearing the proper Personal Protective Equipment (PPE) on construction site.

ABSTRAK

Kecederaan telah dikenalpasti sebagai isu yang serius di tapak bina. Tujuan kajian ini adalah untuk mengurangkan Faktor Risiko Ergonomik (ERF) di tapak bina dengan mengatasi ERF di tapak bina. Kajian literatur telah dijalankan dan soal selidik telah diformulasikan dan telah diedarkan di tapak pembinaan di sekitar Johor Bahru. Data yang diperolehi telah dianalisis dengan menggunakan HIRARCH. Hasil soal selidik menunjukkan bahawa dengan melakukan gerakan yang kerap tanpa mempunyai masa rehat mahupun berhenti seketika ketika melakukan sesuatu tugas, alatan kerja yang mempunyai berat yang berlebihan, dan bekerja dengan melakukan pergerakan yang sama berulang-ulang kali telah menjadi antara risiko yang tertinggi di tapak bina. Oleh yang demikian, untuk mengurangkan gangguan kesakitan yang berpanjangan adalah dengan mempunyai keperluan rangkaian komunikasi yang teratur di tapak bina, kawalan dari pihak pengurusan, penyediaan beberapa program dan latihan, dan juga akan pemakaian Peralatan Perlindungan Peribadi (PPE) dan seterusnya akan dapat mengurangkan gangguan muskuluskeletal (MSDs).

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LIST OF ABBREVIATIONS

CTD	Cumulative Trauma Disorder
ERF	Ergonomic Risk Factors
DOSH	Department of Safety and Health
HAV	Hand-am Vibration
HIRARC	Hazard Identification, Risk Assessment and Risk Control
LBP	Low Back Pain
MSD	Musculoskeletal Disorders
OSHA	Occupational of Safety and Health
PERKESO	*Pertubuhan Keselamatan Sosial*
PPE	Personal Protective Equipment
SOCSO	Social Security Organisation
SPSS	Statistical Package for the Social Science
WBV	Whole-body vibration

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION AND BACKGROUND

Risk factors can define as an actions as well as conditions that some condition will upturn the chances of harm in the direction of the musculoskeletal system. Applied ergonomics literature recognizes a small set of common physical risk factors across many occupations and work setting (Cohen A.C et al. 1997). Ergonomic risk factors are not only affecting the people immediately but also they take time to commence the affection on the person's health. A musculoskeletal disorder is one of ergonomic injuries which it was the most common problem in the construction site. This type of injuries can really affect the health of workers that are exposed to the hazards for a long period of time.

Work place has been considered occasionally to interchange products otherwise being sustenance instrument competently. Since their workers looks like always seem so adaptable, this spectacle that they must fit without a glitch to be given a smaller amount of an attention. According to OSHA, 1994, ergonomic is a science of designing the job

to fit the workers, rather than forcing the worker to fit the job. Construction industry was one of risky activity and it was recorded as one of the most activity for occupational accidents statistic by sector.

Apart from manufacturing, mining and quarrying, construction activity were in the dangerous industries with high level of injuries as shown as Figure 1.1 and Figure 1.2.

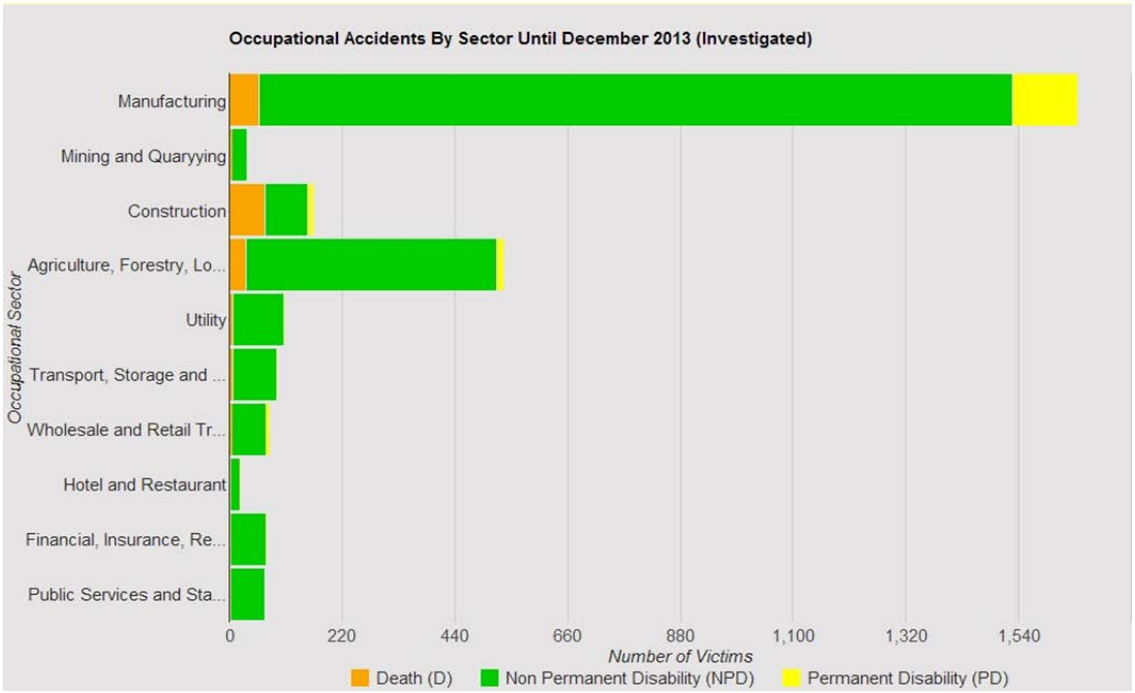

Figure 1.1: Occupational Accidents by Sector until December 2013 *(Investigated) (DOSH, 2014)*

Figure 1.1 shows that construction industry at the top three of the occupational accident by sector until December 2013 (investigated). Number of victims for construction industry recorded those 69 victims for Death (D), 83 victims for Non-Permanent Disability (NPD) and 12 victims for Permanent Disability (PD).

Compare with the top occupational accidents which is manufacturing was recorded as the highest cases which are recorded as 58 victims for Death (D) cases, 1,469 victims for Non-Permanent Disability (NPD) and 128 victims for Permanent Disability (PD).

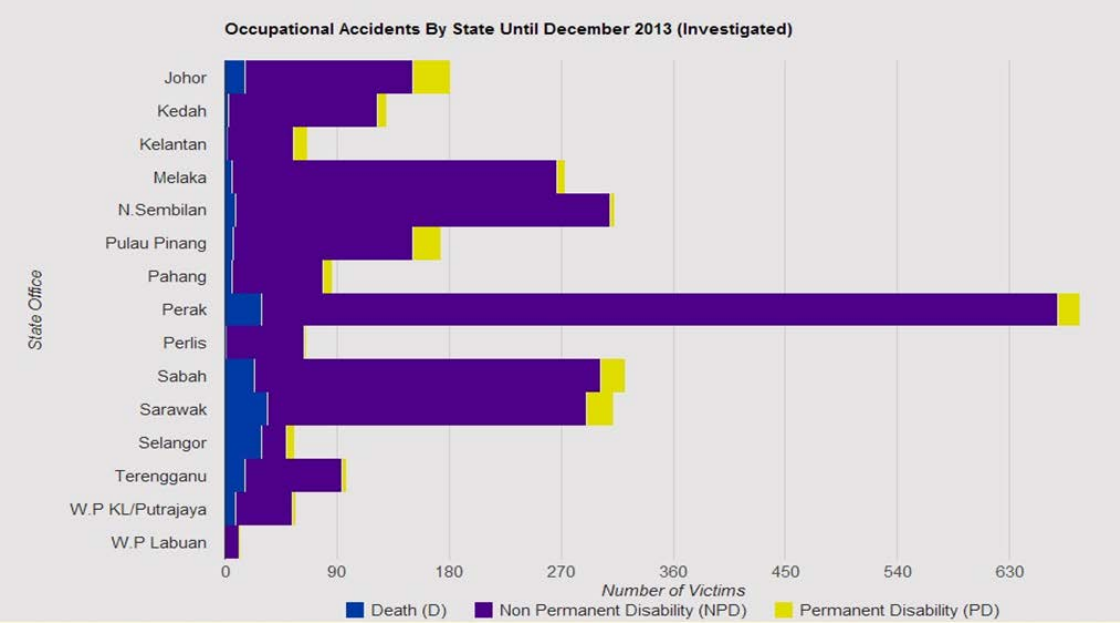

Figure 1.2: Occupational Accident by State until December 2013 (Investigated) *(DOSH, 2014)*

Figure 1.2 shows that Johor at the top five of the occupational accident by state until December 2013 (investigated). Number of victims for construction industry recorded those 16 victims for Death (D), 135 victims for Non-Permanent Disability (NPD) and 30 victims for Permanent Disability (PD).

Compare with the top occupational accidents which is Perak was recorded as the highest cases which are recorded as 29 victims for Death (D) cases, 640 victims for Non-Permanent Disability (NPD) and 18 victims for Permanent Disability (PD).

Table 1.1: Number of Occupational Accidents Statistics by Sector, 2013 *(DOSH, 2014)*

RANK-ING	INDUSTRY	ACCIDENT REPORTED			
		DEATH (D)	NON PERMENANT DISABILITY (NPD)	PERMENANT DISABILITY (PD)	TOTAL
1.	Manufacturing	58	1,469	128	17,106
2.	Agriculture, Forestry, Logging and Fishing	33	448	14	10,168
3.	Construction Industry	69	83	12	4,937
4.	Utility	7	100	1	4,361
5.	Transportation and Storage	8	84	0	3,851
6.	Wholesale and Retail Trade	5	66	7	2,410
7.	Financial, Insurance, Real Estate & Business Services	0	70	0	987
8.	Public Services and Statutory Bodies	0	72	0	773
9.	Mining and Quarrying	5	30	0	421
10.	Hotel & Restaurant	0	19	0	347
	GRAND TOTAL	**49,059**	**10,838**		**59,897**

Malaysian economy has been expanded at a faster pace of 2.1 percent over the previous quarter, up from 1.7 percent in the previous three-month period. The growth rate for full 2013 also decelerated to 4.7 percent, from 5.6 percent in 2012 (Department of Statistics Malaysia, 2014). The significant role has been improved from the construction industry to make the country's economic growth. Despite on the massive

contributions to economic growth, construction industry has been blamed for the high rate of accidents and fatalities.

The latest annual report updated by the Social Security Organization (SOCSO), and it also known as *Pertubuhan Keselamatan Sosial* (PERKESO, 2012), recorded that the construction accident has been reach for 5,117 accident reported it contain that a higher number 4,536 of male workers were involved with accidents compared to 641 female workers who are involved in accidents. These total of number to compare to year 2011 which is have comparison among the total of number accident reported 4,937 people who are involved in accident in the construction industry. It involved 4.330 of male workers were involved with accidents compared 607 female workers who are involved in accidents. Both report shows that even the major and high-growth construction industry faces a high risk of accident occurrence.

The elementary proposition of ergonomics in the job demands should not go beyond workers' abilities and inadequacy make certain that they would not be wide-open to work stress that unsympathetically have emotional impact their well-being and healthiness as well as the establishment's efficiency. For that reason, the impartial of an ergonomics platform is to be responsible for a safe and industrious shop floor to the worker's coziness to bring about the goals and points of the organization.

1.1 PROBLEM STATEMENT

The workplace and construction productiveness is a vibrant and precarious industry, creating it in cooperation irreplaceable and thought-provoking intended for ergonomic sides to be carry out on site. And so, there are lots of guiding influences that can be taken into consideration in executing ergonomics and supervisory ergonomics to jeopardy the issues in the construction place. Ergonomic controls are used to help appropriate the workstation to the wage earner. They strive for to place the body in a nonaligned position and reduce the other ergonomic risk factors. These controls must provide somewhere to stay the widest range of personnel. There are a few line of attacks and steps can be taken to expand ergonomics putting into practice in the workplace and to shrink the risk factors that be able to be done over and done with a little control networks.

1.2 AIM OF STUDY

The aim of this research is to reduce ergonomics injuries by mitigating ERFs on construction site. To achieve the aim the followings objectives have been identified.

1.3 OBJECTIVES OF STUDY

The objectives of this research are:

1) To study the ergonomic risk factors on construction sites.
2) To investigate the factor affecting ergonomics risk factors.
3) To recommend methods to mitigate ergonomics risk factors on construction site.

1.4 SCOPE OF RESEARCH

Throughout the entire process of the research, it will center on the construction site in the states of Johor Bahru, Malaysia. The target respondents include all participants involved in the construction projects such as general workers, contractors, consultants, safety officers, site supervisors, project managers and others. Mainly those respondents are general workers, contractors and project managers.

The respondents will be randomly chosen to respond to the interviews and questioners.

1.5 SIGNIFICANT OF STUDY

The idea for doing this study is want to identify and distinguish the project features that are causing construction hazards. Wider perspective from the construction site will be view it in and the investigation to identify the causes or factors that are affecting the project in future.

Identifying the hazards form the project features on the construction sites will assist the research in tracking down the relentlessness of each project feature in bring about the hazards. For each project, the level of severities in influencing hazards and the causes affecting the project features will be identified and labeled it from the lowest it highest influence of hazards.

The results from the analysis will enable recommendations on ways to reduce hazards on construction site. The result of the study is expected to provide information to avoid or reduce hazards on construction sites, thus improving the working conditions in the construction industry to a status of a safe industry.

1.6 METHODOLOGY

1) Literature review:
    a. Previous thesis
    b. Articles and magazines

c. Books and journal

2) Empirical study will involve the collection of data and information through interviews and surveys (e.g.: workplace observation, questionnaires, etc.)
3) Analysis of data was conducted using appropriate methods (SPSS and etc.)

1.7 RESEARCH METHODOLOGY

In order to complete the research methodology of this study, there are certain processes that need to be identified and implemented. The methodology of this research is carried out in order to determine the essential steps that will be performed to meet the objectives of this research. The steps of the process involved for the completion of this research:

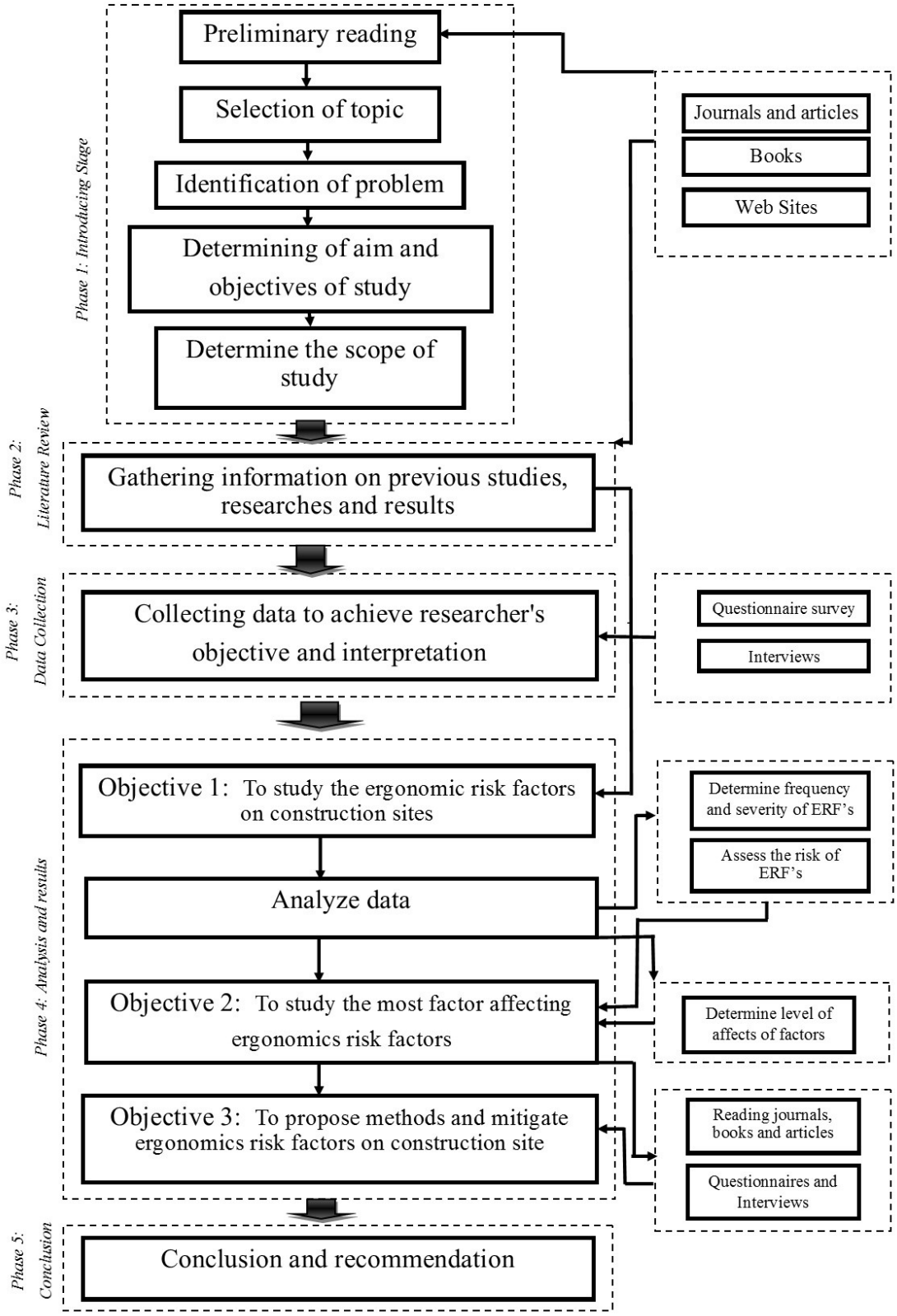

Figure 1.3: Research framework flow chart

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