

**WORK SITUATION AWARENESS, INCIDENCE OF
ACCIDENTS AND SEVERITY & JOB
SATISFACTION IN THE CONSTRUCTION
INDUSTRY**

by

NURHANIZA HARUN

**A dissertation submitted in partial fulfillment of the
requirements for the
Degree of Bachelor of Health Sciences (Hons)
(Environmental and Occupational Health)**

JUNE 2014

CERTIFICATE

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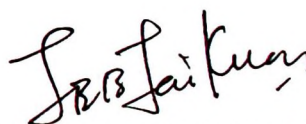
Signature of Supervisor



.....
Dr. Foo Keng Yuen
Environmental and Occupational Health
School of Health Sciences
Universiti Sains Malaysia

17/6/2014
Date:.....

Signature of Co-Supervisor



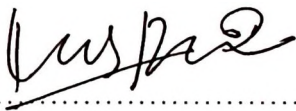
.....
Dr. Lee Lai Kuan
Nutrition
School of Health Sciences
Universiti Sains Malaysia

17/6/2014
Date:.....

APPROVAL PAGE

This is to certify that I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation submitted in partial fulfillment for the degree of Bachelor of Health Sciences (Hons) (Environmental and Occupational Health).

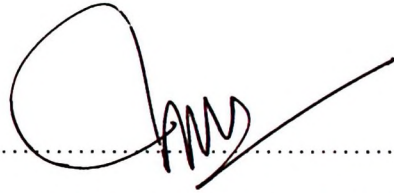
Signature of Internal Examiner



.....
Mr. Mohd Nasrom B Mohd Nawi
Environmental and Occupational Health
School of Health Sciences
Universiti Sains Malaysia

Date: 17 June 2014

Signature of External Examiner

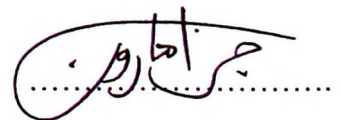


.....
Dr. Ahmad Fahmi Lim Abdullah
Forensic Science
School of Health Sciences
Universiti Sains Malaysia

Date: 18/6/2014

DECLARATION PAGE

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions.

A handwritten signature in black ink, written in a cursive style, positioned above a horizontal dotted line.

Nurhaniza Harun

June 2014

*Dedicated to my mother, my father, my siblings, and my loved one for their love,
sacrifices and inspiration*

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LIST OF ABBREVIATIONS

CIDB	Construction Industry Development Board
DOSH	Department of Occupational Safety and Health
JSS	Job Satisfaction Survey
LOS	Length of Service
OHS	Occupational Health and Safety
PPE	Personal protective equipment
SOCSO	Social Security Organisation
SPSS	Statistical Packaging for Social Sciences
WSA	Work Situation Awareness

LIST OF SYMBOLS

<i>d</i>	Degree of Accuracy
<i>df</i>	Degree of Freedom
<i>et al.</i>	<i>Et alia</i> (and others)
<i>N</i>	Population size
<i>p</i>	<i>p value</i>
<i>r</i>	Correlation value
<i>t</i>	<i>t value</i>
X^2	Table value for the Chi-Square
%	Percentage
<	Less than
>	More than

KESEDARAN SITUASI TEMPAT KERJA, INSIDEN KEMALANGAN DAN TAHAP KETERUKAN, & KEPUASAN KERJA DI INDUSTRI PEMBINAAN

ABSTRAK

Industri pembinaan merupakan antara yang paling berbahaya, seperti yang dikadarkan dengan kematian disebabkan kerja, kadar kecederaan, dan bayaran pampasan pekerja. Objektif utama kajian ini ialah untuk mengkaji dan mengenal pasti status semasa kesedaran situasi tempat kerja, insiden kemalangan dan tahap keterukan, dan kepuasan kerja dalam kalangan pekerja di tapak pembinaan. Hubungan antara faktor-faktor ini dengan taburan data sosio demografi turut dikaji. Kajian ini dijalankan bermula dari Disember 2013 sehingga Mac 2014. Kaedah kajian yang digunapakai untuk tesis ini adalah berdasarkan soal selidik yang tertumpu kepada 369 orang pekerja am di tapak pembinaan. Responden telah mengisi soal selidik melalui pernyataan pendirian mereka dengan menanda setiap ítem soalan menggunakan skala 5-point Likert, berjulat antara sangat tidak setuju kepada sangat setuju. Set soal selidik ini merupakan kombinasi antara Skala Kesedaran Situasi Tempat Kerja, Kajian Insiden Kemalangan dan Tahap Keterukan, dan Kajian Kepuasan Kerja. Kajian mendapati bahawa pekerja am di tapak pembinaan merekodkan nilai purata min terhadap kesedaran situasi tempat kerja. Tiada impak signifikan sosio demografi ke atas kesedaran tersebut. Namun, pekerja tapak pembinaan merekodkan nilai min yang lebih tinggi terhadap pengenalanpastian insiden kemalangan dan tahap keterukan, dan kepuasan kerja. Tiada impak signifikan sosio demografi ke atas keterukan insiden, namun terdapat signifikan antara kepuasan kerja dan tempoh perkhidmatan, $p < 0.05$ dengan nilai ($p = 0.014$). Terdapat hubungan positif yang lemah, $p < 0.05$ antara kesedaran situasi tempat kerja dan kepuasan kerja dengan nilai ($r = 0.133$). Berdasarkan hasil dapatan kajian, pemantauan dan penguatkuasaan keselamatan adalah perlu bagi memastikan keberkesanan kesedaran situasi tempat kerja, pencegahan kemalangan dan kepuasan kerja pekerja di tapak pembinaan.

WORK SITUATION AWARENESS, INCIDENCE OF ACCIDENTS AND SEVERITY, & JOB SATISFACTION IN THE CONSTRUCTION SITE

ABSTRACT

Construction industry is among the most hazardous, as measured by work-related mortality, injury rates, and workers' compensation payments. The main objective of this study was to investigate and identify the present status of work situation awareness, incidence of accidents and severity, and job satisfaction among the general workers at the construction site. The correlation between these factors with socio demographic data was evaluated. The study was conducted from December 2013 to March 2014. The methodology adopted in this study was based in comprehensive questionnaire targeting 369 general workers of construction site. Their preference was rated using a 5-point Likert scale ranging from very disagree to highly agree. The questionnaire set is a combination of Work Situation Awareness Scale, Incidence of Accidents Severity Survey and Job Satisfaction Survey. It was found that construction workers showed an average mean of work situation awareness. There was no significant impact of socio demographic on the awareness. In contrast, the construction workers recorded a higher mean of identification of accidents' severity and job satisfaction. There was no significant impact of socio demographic on the accidents' severity, however, there was significance between job satisfaction with the length of service, $p < 0.05$ with ($p = 0.014$). Result revealed a poor positive correlation significance, $p < 0.05$ between Work Situation Awareness and Job Satisfaction with ($r = 0.133$). Based on the findings from the study, monitoring and safety enforcement are necessary for effective construction working situation awareness, accident prevention, and job satisfaction of the workers.

CHAPTER ONE

INTRODUCTION

1.1 Current scenario of the occupational safety and health in the construction industry

Construction industry plays a major role for the development and achievement the goals of society. Navon, (2005) stated in his study that the construction is one of the largest industries and contributes to about 10% of the gross national product (GNP) in industrialised countries. The construction industry is among the most hazardous, as measured by work-related mortality, injury rates, and workers' compensation payments (Glazner et al., 1998; United States Department of Labor, 2000). Construction safety is of grave concern around the world due to its unique nature (Behm, 2005; Fang et al., 2004; Kartam et al., 2000). In construction, safety is also an integral component of a construction project that cannot be isolated from other project elements. Hinze (1997) advocated the idea that safety is no luxury but a necessity. In recent years, many construction companies have recognised this importance that the establishment of good safety culture can help controlling and reducing the construction costs and increase the efficiency of their ongoing operations in long term.

The standard on Occupational Health and Safety Assessment Series (OHSAS) 18001:1999 offers a good framework for safety in construction operations. The OHSAS 18001 specifies requirements for an organization to control its occupational health and safety (OHS) risks to improve its performance (BSI, 1999;

Pun et al., 2003). Health and safety issues are not confined to the construction phase of a project but occur throughout a project or facility's life. Many of the common health and safety problems encountered during construction and operation could be avoided if due consideration and effort were invested during the project brief and design phases (Haywood, 2004). Occupational health and safety risks should be assessed and control decisions made in the concept design, project planning, specification and tendering, and contractor selection stages of a construction project (European Construction Institute [ECI], 1996). It is important that the structure of the construction industry and the organizational processes adopted be examined in order to identify methods of achieving increased integration of occupational health and safety risk control decision-making between parties to a project.

The working environment in construction is constantly changing, sites exist for a relatively short period of time, and the activities and related hazards and risks change daily, which means that occupational health and safety vigilance and awareness is critical. In construction industry, it may be more challenging to achieve persistent intervention effect because of the dynamic and transitory nature of construction sites and workforce (Ringgen et al., 1995). The complicated environment and placeless machinery and workforce on construction sites may bring great uncertainty to the intervention outcomes. The nature of the construction industry's rapidly changing conditions, associated work hazards, and the characteristics of construction organizations further aggravate the situation. Lee (1993) noted in the study that the mobility of workforce on construction sites may be much higher than that in many other industrial settings, especially under the system of labor subcontracting.

It is not unusual to observe that actual schedule and quality performances are different from planned performances (e.g., schedule delay and rework) during a construction project. Such differences often result in production pressure (e.g., being pressed to work faster) and negatively affects safety performance. As progress deviation increases, workers are encouraged by management to complete their work within the contract time. The resulting production pressure (e.g., being pressed to work faster) adversely affects safety performance (Goldenhar et al., 2003; Mitropoulos and Cupido, 2009). Rework that results from quality deviations is also a major contributor to production pressure (i.e., schedule pressure), which consequently degrades safety management (Rodrigues and Williams, 1998; Love et al., 1999; Park and Peñna-Mora, 2003). Safety is then affected by the turnover when the cumulative experience of on-site workers deteriorates. Mitropoulos and Cupido (2009) additionally showed that accident rates can be reduced through the prevention of errors during dangerous activities.

In construction, rework results from quality deviations caused by changes, errors, and omissions during design and construction (Sommerville, 2007). Rework, which means to work again, is a major contributor to schedule delays and cost overruns, which are negative factors in safety management (Park and Peñna-Mora, 2003; Lee et al., 2005). Love and Edwards (2004) stated that rework often requires diverting resources (e.g., overtime work, new hires, pushing workers to work fast) for the recovery, undermines the effective supervision of other work and results in demoralization, fatigue, and absenteeism, all of which have a negative effect on project safety.

Suraji et al. (2001) found in their study that everyone involved in the construction project will have the potential to initiate inappropriate constraints that are likely to increase the risk of accident. Workers on sites are likely to work under inappropriate construction control, unsafe site condition or unreasonable work arrangement caused by their superiors. A study by Evelyn et al (2005) revealed that site accidents were more likely to happen when there were inadequate company policies, unsafe practices, poor management commitment, and insufficient safety knowledge and training of workers. Nowadays, one of the most pressing concerns for this construction industry is the occupational safety and health which is an increase in the accidents and health problem (Solicitors, 2010). Occupational safety and health issues are not limited to the construction stage of a construction project management but also arise throughout a project's life (Haywood, 2004). According to Chan et al. (2005), accidents happen due to a random combination of many contributing factors. Many studies revealed that the majority of accidents and resulting injuries are attributed to unsafe work practices of the workers rather than unsafe working conditions (e.g. Garavan and O'brien, 2001).

The majority construction fatalities in the worldwide results from fall from heights, burial by earth collapse during excavations, struck by moving vehicle, motor vehicle, etc. The poor health and safety records in construction are generally by these reasons (Fung et al., 2010) : high-risk nature in construction work, building terms decreasing, insufficient health and safety solutions in phase of construction preparation, low demands on site facility according to law, complicated contractor system with big amount of subcontractors, thin exercitation of collective protection and technical safety by reason of the building costs increasing, low level and absence

or malfunction of safety management and control systems especially in small construction companies and tradesman, as well as low knowledge and a serious lack of construction safety risk awareness of persons in industry. Individuals working for smaller contractors may be at greater risk, as safety problems are more prevalent at smaller construction companies (Cheng et al., 2010; Kines & Mikkelsen, 2003; Shalini, 2009). Worksite training is often inadequate (Hung et al., 2011), on-site safety professionals are rare, safety innovation has lagged behind commercial construction, and conventional methods of fall protection are rarely used (Kaskutas et al., 2010a,b).

Researches also showed that the main causes of the fatalities in construction are due to falls, struck-by incidents, caught in/between incidents and electrocutions. It has been also indicated that the most significant factor in construction site accidents is the unsafe behaviour (Sawacha et al., 1999). In construction, few studies have examined the mechanism through which organizational factors influence individual safety behaviour at work (Griffin and Neal, 2000). For example, researchers have examined factors associated with safety climates (Mohamed, 2002) within construction organizations and have suggested the need for a fundamental shift in one understanding of how safety is to be managed. The incident rate decreases with the reduction of unsafe behavior (Tomas et al., 1999; Choudhry et al., 2008). Safer behaviour is reflected by good attitude. Many accidents/incidents that occurred in the workplace especially in the building construction sites are due to inadequate adherence of workers to work procedures. Mullen (2004) found, when interviewing people in various occupations about what influenced their safety behavior, that when resources were inadequate, there was pressure from both

managers and coworkers to prioritize performance over safety, and that such pressure swiftly socialized individuals to adapt and consider unsafe practices as normal.

For construction sites with 50 employees or more, the contractors have to nominate a full time safety inspector on site; for sites exceeding 10,000 m² there must be at least 2 safety inspectors on site; wherever the sites exceed 50,000 m², the main contractor has to establish a safety management team (Tam et al., 2004). Safety demands planning and definition of detailed procedures to be effectively implemented in the field. Therefore, safety and health professionals need to be involved during the project's procurement and preconstruction phases. Jeffcott et al. (2006) demonstrated that if there is a tendency to assign blame for incidents and accidents, safety management tends to become increasingly proceduralised. Fang et al. (2006) stated that workers with good safety knowledge have a more positive safety climate than those with poor safety knowledge. Wallace et al. (2006) found that management–employee relations and organizational support were positively related to good safety climate, which in turn predicted a lower frequency of occupational accidents. The top skills demonstrated by superior construction mentors include the ability to communicate, share knowledge, and correct mistakes (Hoffmeister et al., 2011).

Safety programs are one of best ways in improving site safety performance (Tam et al., 2004). An effective safety programme can substantially reduce accidents because it could help management to build up safer means of operations and create safe working environments for the workers (Abdelhamid and Everett, 2000; Rowlinson, 2003). More than preventing injury to workers, successful safety

programmes can minimize damage to equipment and tools, loss of market competition, project delays, and damage to company image or reputation (Findley et al., 2004). Although the linkage between safety programs and the actual state of safety has been studied extensively, minimal effort has been made to investigate factors contributing to successful implementation of such safety programs at construction sites (Tam et al., 2004; Sawacha et al., 1999; Findley et al., 2004). Some studies (e.g. Stranks, 2000; Rue and Byars, 2001; Rowlinson, 2003; Tam et al., 2004, Abudayyeh et al., 2006) have identified several factors contributing to successful safety programmes such as worker involvement, management commitment, sufficient resource allocation and teamwork.

According to the Occupational Safety and Health Council (OSHC), PPE means any protective equipment that protects users from being exposed to a potentially hazardous environment (OSHC, 2006). Research has been conducted that using PPE is a factor which would be positively correlated ($r = 0.69$) at significant level of 0.001 to safety performance on construction sites and became the third most important factor affecting safety performance (Sawacha et al., 1999). As mentioned from accident statistics (Labour Department, 2004), the highest rate of causing fatality by single injured body part in construction accident is skull. It is thus essential to provide safety helmets to workers to wear on site at all time. Industrial helmet is made of strong and light material in order to prevent damage from falling objects (Brauer, 2006). A safety helmet will not only prevent head injury accidents, but also minimize the severity of such accidents (Labour Department, 2004).