UNIVERSITI PUTRA MALAYSIA

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DEPARTMENT OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH

FACULTY MEDICINE AND HEALTH SCIENCES

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A project paper submitted as partial fulfillment of the requirement for degree of Bachelor of Science (Environmental and Occupational Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

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With the Selawat and Salam to Prophet Muhammad SAW.,

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ABSTRACT

PREVALENCE OF OCCUPATIONAL STRESS AMONG CRANE OPERATORS IN A CONTAINER TERMINAL PORT, IN PENANG

NORWAHIDA BT YAKUB @ YAAKUB

Introduction: Crane operators are workers who work at container terminal. The scope of their jobs are loading and unloading containers from or to vessels and handling container activities around yard areas at the port. They need to drive 24 hours a day, 7 days per week and as per the demands of theirs' vessel schedules. Demands of the job contribute to occupational stress including physical challenges, health problems, and psychological symptom (depression, anxiety, and stress).

Objectives: This study was conducted to determine occupational stress and psychological factors among crane operators working in a container terminal at the Penang Port.

Methodology: This was a cross sectional study. A total of 240 crane operators at the Penang Port container terminal participated in this study. Respondents were interviewed using questionnaires based on the Job Content Questionnaire (JCQ) and Depression, Anxiety, and Stress Scale (DASS 21-items).

Results: The response rate was 100%. Statistical analysis showed the prevalence of occupational stress among respondents was 43.75%. Result from Chi-square test showed that the factors significantly associated with occupational stress were age (χ^2=4.331, p=0.038), decision latitude (χ^2=24.490, p=<0.001), psychological job demand (χ^2=27.498, p=<0.001), anxiety (χ^2=7.659, p<0.006), toxic exposure (χ^2=5.510, p=0.019), physical isometric loads (χ^2=4.572, p=0.032), and muscle ache (χ^2=4.354, p=0.037). Further analysis using multiple logistic regression, showed that the predictive factors for occupational stress were psychological job demands (OR = 4.137, 95% CI = 2.258 - 7.579), physical isometric loads (OR = 1.902, 95% CI = 1.044 - 3.463), muscle ache (OR = 1.761, 95% CI = 0.899 - 3.449), anxiety (OR = 2.314, 95% CI = 1.242 - 4.311), toxic exposure (OR = 1.612, 95% CI = 0.774 - 3.316) and decision latitude (OR = 0.248, 95% CI = 0.127; 0.484).

Conclusion: The findings of this study showed that there was a high prevalence of occupational stress among crane operators. Factors associated with occupational stress among these workers suggest that the job demands are challenging, especially in terms of high skills and physical demands. The management should be aware of these problems among their workers and implement preventive approaches to ensure the safety and productivity of their workers.

Keywords: Occupational stress, depression, anxiety, stress, and crane operators

ABSTRAK

KELAZIMAN TEKANAN KERJA DIKALANGAN PENGENDALI KREN DI PELABUHAN TERMINAL KONTENA, PULAU PINANG

NORWAHIDA BT YAKUB @ YAAKUB

Pengenalan: Pengendali kren adalah pekerja yang bekerja di terminal kontena. Skop pekerjaan mereka ialah memuat dan memunggah kontena dari atau ke kapal dan juga aktiviti mengendalikan kontena di sekitar kawasan yad di pelabuhan. Mereka perlu bergerak sepanjang 24 jam sehari, 7 hari seminggu untuk memenuhi permintaan bagi jadual kapal. Permintaan kerja akan menyumbang kepada tekanan kerja termasuk cabaran fizikal, masalah kesihatan dan simptom psikologi (kemurungan, kebimbangan dan tekanan).

Objektif: Kajian ini telah dijalankan untuk menentukan tekanan kerja dan faktor psikologi di kalangan pengendali kren yang bekerja dalam terminal kontena di Pelabuhan Pulau Pinang

Kaedah: Ini adalah satu kajian keratan rentas. Jumlah semua pengendali kren di kontena terminal, Pelabuhan Pulau Pinang yang mengambil bahagian dalam kajian ini ialah 240 orang. Responden telah ditemualbual dengan menggunakan borang kaji selidik berdasarkan '*Job Content Questionnaire*'(JCQ) dan Skala Kemurungan, Kebimbangan dan Tekanan (DASS 21).

Keputusan: Kadar respons ialah 100%. Analisis statistik menunjukkan kelaziman tekanan kerja dikalangan responden ialah 43.75%. Keputusan daripada ujian *chi-square* menunjukkan faktor penting yang mempunyai perkaitan dengan tekanan kerja iaitu umur (χ^2=4.331, p=0.038), keputusan secara latitude (χ^2=24.490, p=<0.001), permintaan kerja psikologikal (χ^2=27.498, p=<0.001), kebimbangan (χ^2=7.659, p<0.006), pendedahan kepada toksik (χ^2=5.510, p=0.019), muatan isometrik fizikal (χ^2=4.572, p=0.032), dan sakit otot (χ^2=4.354, p=0.037). Analisis lanjutan dijalankan menggunakan ujian regresi logistik berganda dan menunujukkan faktor peramal bagi tekanan kerja adalah permintaan kerja psikologikal (OR = 4.137, 95% CI = 2.258 - 7.579), muatan isometrik fizikal (OR = 1.902, 95% CI = 1.044 - 3.463), sakit otot (OR = 1.761, 95% CI = 0.899 - 3.449), kebimbangan (OR = 2.314, 95% CI = 1.242 - 4.311), pendedahan kepada toksik (OR = 1.612, 95% CI = 0.774 - 3.316) dan keputusan secara latitud (OR = 0.248, 95% CI = 0.127; 0.484).

Kesimpulan: Dapatan kajian ini menunjukkan bahawa terdapat kelaziman yang tinggi bagi tekanan kerja dikalangan pengendali kren. Faktor yang berkaitan dengan tekanan kerja dikalangan mereka ialah permintaan kerja iaitu cabaran, terutamanya kemahiran tinggi dan permintaan fizikal. Pihak pengurusan perlu berwaspada hal berkaitan masalah ini dikalangan pengendali kren dan mengambil pendekatan pencegahan untuk memastikan keselamatan dan produktiviti pekerja mereka.

Kata Kunci: Tekanan Kerja, kemurungan, kebimbangan, tekanan, pengendali kren

CONTENTS

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURE

LIST OF APPENDICES

LIST OF ABBREVIATION

=	Is equal to
%	Percentage
χ^2	Chi – square
<	Is less than
(,)	Parentheses
CI	Confidence Interval
CSU	Corporate Source Unit
Etc.	Etcetera
et. al	And colleague
HSE	Health and Safety Executive
NIOSH	National Institute for Occupational Safety and Health
OR	Odd Ratio
OSHA	Occupational Safety and Health Act
PM	Prime Mover
QGC	Quay Gantry Crane
RERF	Radiation Effects Research Foundation
RMG	Railed Mounted Gantry
RTG	Rubber Tyred Gantry
STS	Seaside to Shore
TEU'S	Twenty-foot equivalent units
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

Occupational stress is a psychosocial hazard that poses a threat to the health of workers as well as the organization (NIOSH, 1999). Psychosocial, environment and organizational conditions as well as employees' competencies affect each other. If negatively associated, these interactions can cause hazardous effects to workers' health (WHO, 1999). Occupational stress is a global concern, which has increased during the past decades. It has been reported that three quarters of Americans experience symptoms related to stress where 77% of them experience physical symptoms and 73% experience psychological symptoms (Sara Weiss *et. al* , 2007).

In Malaysia, recent studies show that 11.3 % of the 26 million populations have mental health problems and if not treated, it could be worse in upcoming generations (Berita Harian, 2010). Commonly, stress in the workplace affects

psychological and emotional as well as physical functioning. Occupational stress has been associated with depression, anxiety, substance abuse and nonspecific stress-related symptoms. It occurs when workers cannot cope with their working environment. Factors that contribute to occupational stress are poor support, work demands, lack of role clarity, low levels of recognition and reward, poorly managed rotation of work and organizational injustice.

In port industry, occupational stress relates to job tasks where focus on work is compulsory and high precision is crucial for every single movement. These conditions diminish the worker's effectiveness and result in considerable morbidity and mortality. According to a study in Canada, crane operator is the job that is affected by occupational stress (Alberta Health Services, 2010).

Employees are assets of organizational development and contribute to the country's economic. It is the general duty of the employers to provide safe and healthy workplaces, as well as secure the welfare of their employees. Providing a safe and healthy workplace includes ensuring that there is no negative impact to workers (OSHA, 1994).

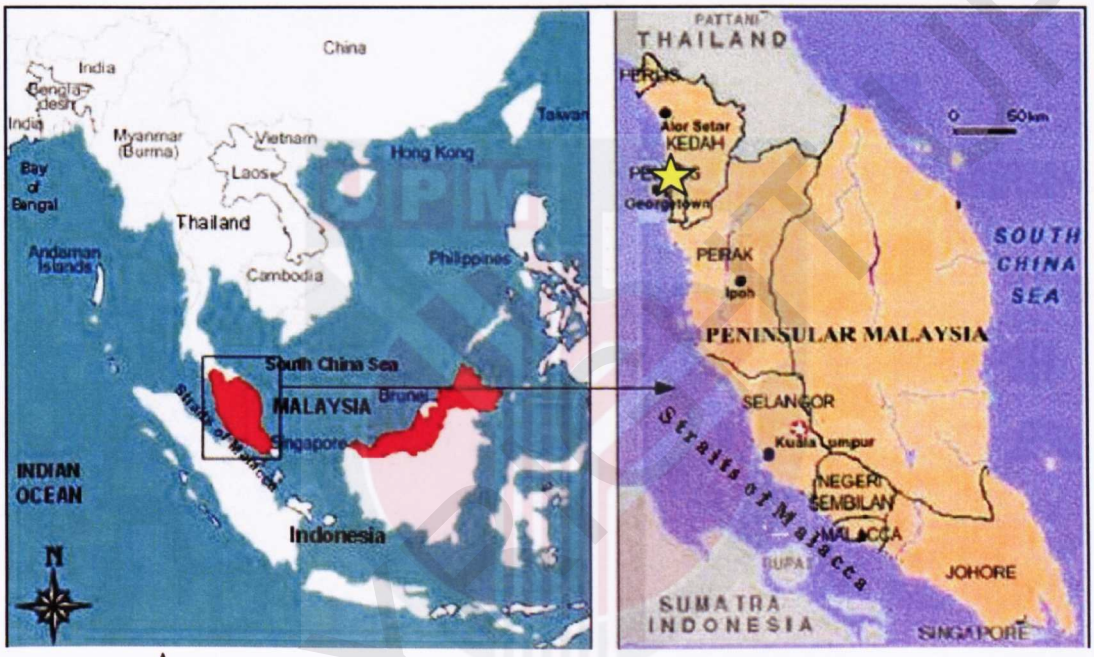
The scope of a crane operator's job includes weighing, moving, and stacking loads such as frozen goods, hazardous products and cargo using hoisting attachments like spreaders and slings. The challenges in their jobs are to ensure the loads and hatch covers safely land on the vessel or on the wharf. They need skills to adjust the

loads to avoid any damage on vessel equipments, like cell guides, hatch covers and container walls.

So far, there has been no study on occupational stress among crane operators in Malaysia. Most studies focused on teachers, students, top-level officers, manufacturing workers and nurses.

The entire container terminals around the world are always trying to get high productivity amount in term of number of container handling. Therefore, they will be listed in world top container ranking. Malaysia is currently active in import and export activities and is top 20 in world top container ranking. The amount of number of the container handling is measured in TEU's. The term means twenty-foot equivalent units, a standardized maritime industry measurement used for counting cargo containers of varying lengths or the other word is the international measure for smallest box of container (POLB, 2011). If the TEU's is increase meant that, the productivity of the container terminal is very high. It is in sequence with container terminal that has operates on 365-days a year, 7-day a week, 24 hours. Therefore, its workers may be subjected to occupational stress as well.

Malaysia is located in the central part of South-East Asia. There are eleven port terminals in Malaysia such as Port Klang, Tanjung Pelepas Port (PTP), Johor, Penang, Kuantan, Bintulu, Sepangar, Sabah, Kuching, Rajang and Miri. Figure 1.1 shows the map representation of the Penang Container Terminal which controls the northern region. It means that the port covers the needs for the northern coastal strip.



Legend : ★ Penang Port

Figure 1.1 : Map representation Container Terminal Penang is located in Penisular Malaysia

Source : Ishak (2002).

Figure 1.2 shows the schematic representation of a container terminal system in a port. Crane operators carry the containers from the vessels and put them on the prime movers (PMs). The PMs send the containers to the Transfer Cranes (TC) to be stacked in the container yard. This process is part of the crane operator's daily job.

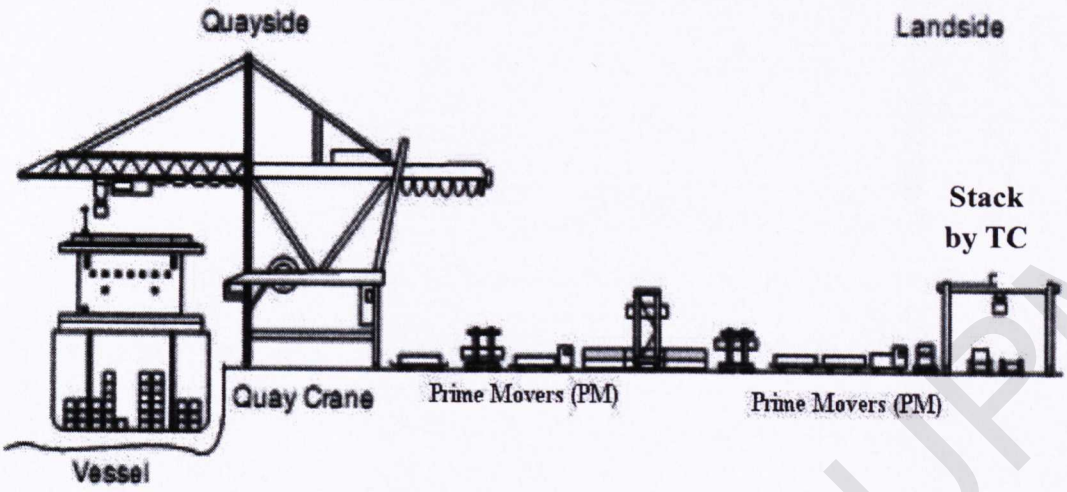


Figure 1.2 : Schematic representation of a container terminal system

Source: Steenken et al., (2004).

The most important area in the container terminal port is the wharf and yard area, where the container handling is conducted. It functions as an open system, where loading and unloading of shipment and goods are conducted (Steenken *et al.*, 2004).

1.2 Research Problem

The problems of stress at work are slowly but surely emerging as a new challenge requiring the attention and resource of employers. Stress, in general and occupational stress, in particular, is a fact of modern day life that seems to have been on the increase. Occupational stress as known as work related stress is recognized globally as a major challenge to workers' health and effect the health of an organization. Occupational stress in Malaysia is a major concern currently. Most

studies have focused on manufacturing industries and teachers. There has not been adequate focus given to crane operators as yet. The level of occupational stress among crane operators has not yet been studied.

In Malaysia, the profession as a crane operator consists mainly of males, where males make up most of the workforce. A crane operator is one profession that requires both mental and physical training. When the workers are operating the crane gantry, it requires coordination skills. They need to hoist the crane and looking down simultaneously using both hands to control the crane's movements. Every vessel needs to be handled differently based on the vessel long side location and type of vessels. Bad weather conditions can make the job of handling containers extremely challenging.

"Togetherness" is a motto at the container terminal port, Penang. It means everyone must always be in a position and be ready in all conditions to perform their job task (Penang Port, 2011).This challenging responsibility may cause emotional problems due to the high expectations related to the responsibilities of crane operators from the top management. Crane operators deal with high risks at work. High numbers of accidents reported in container terminals are related to property damage such as dented containers, falling down containers and cell guide breaks.

Crane operators must work with precision and keep up with a certain pace to achieve their daily productivity target, as well as ensure the safety of the containers and avoid any damage. In Malaysia, there are four ports that act as key players, which are Port Klang, the Penang Port, Tanjung Pelepas and Johor Port. Malaysia was listed in the World Top Container Ranking 2010, which was measured by output (percentage of increasing total number of containers within two years). As shown in Table 1.0, the highest output was achieved by Port Klang (21%), followed by Penang (15%), Tanjung Pelepas (9%) and Johor (4%). Port Klang supported by two huge companies, which are the Northport and the Westport. As for the Penang Port, it operates in container handling and has high output of container handling in 2010 (North Port, 2010).

Table 1.1: Port World Top Container Ranking, 2010

Port	Output 2009 to 2010
Port Klang (Northport & Westport)	21 %
Penang	15 %
Tanjung Pelepas	9 %
Johor	4 %

Source : Northport (2010).

1.3 Research Justification

Perception of occupational stress is a very subjective issue and may be due to the responsibilities of crane operator duties. Studies have found that occupational stress results from the interaction of the workers and the conditions at work.

In Malaysia, many trades use sea as a main route. Many goods and cargo come through sea route by vessels. Container terminals are one of the places with the busiest terminals because most of the consignments come in container boxes. The main activity is conducted in port container terminals, where the main workers handling these containers are the crane operators.

Therefore, this study is important because crane operators are most likely to be subjected to a lot of occupational stress due to the nature and load of their work. The findings can provide information on occupational stress among crane operators and its associated factors.

1.4 Conceptual framework

Figure 1.3 shows the conceptual framework for this study. Besides depression, anxiety and stress, there are others factors that can contribute to occupational stress which are organizational factors and job specific factors as well as socio-demographic factors. Sosio-demographic factors include age, ethnicity, education background, marital status, monthly income and duration of employment. Organizational factors include decision latitude, psychological job demands, job insecurity and social support. The other factors studied are toxic exposure, physical isometric load and muscle ache.

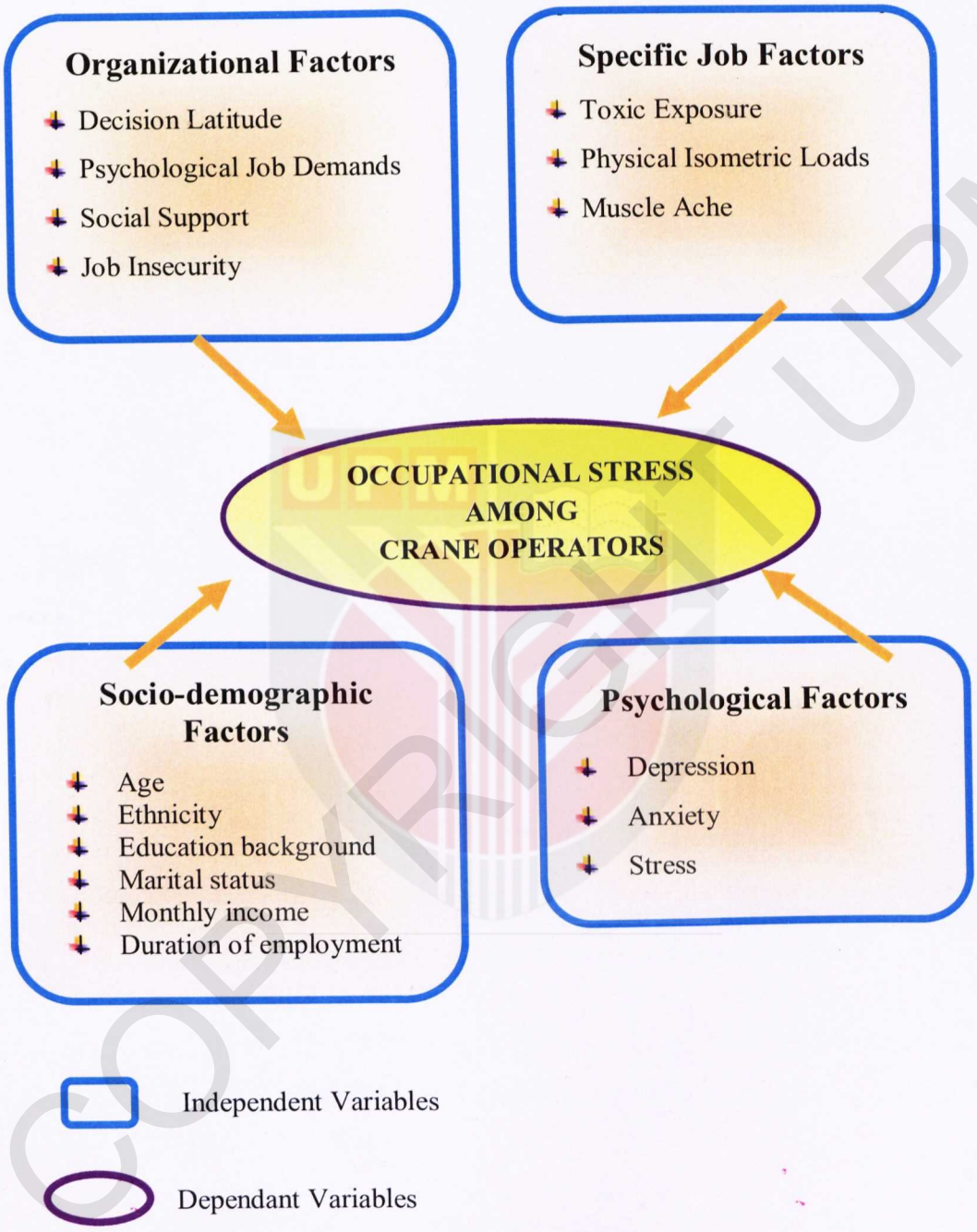


Figure 1.3: Conceptual framework of occupational stress

1.5 Research Objective

1.5.1 General Objective

To determine the prevalence of occupational stress among crane operators in a container terminal port, Penang.

1.5.2 Specific Objective

i) To determine the socio-demographic factors among respondents.

ii) To determine the prevalence of occupational stress (high strain) among respondents.

iii) To determine the relationship between socio-demographic factors (age, ethnicity, education background, marital status, monthly income and duration of employment) with occupational stress among respondents.

iv) To determine the relationship between organizational factors (decision latitude, psychological demand, social support and job insecurity) with occupational stress among respondents.

v) To determine the relationship between psychological factors (depression, anxiety and stress) with occupational stress among respondents.

v) To determine the relationship between specific jobs factors (toxic exposure, physical isometric load and muscle ache) with occupational stress among respondents.

vi) To determine the predicting factors for occupational stress among respondents.

1.6 Research Hypotheses

i) There is a high prevalence of occupational stress (high strain) among the respondents in this study.

ii) There is a relationship between socio-demographic factors (age, ethnicity, education background, marital status, monthly income and duration of employment) with occupational stress among respondents.

iii) There is a relationship between organizational factors (decision latitude, psychological demand, social support and job insecurity) with occupational stress among respondents.

iv) There is a relationship between psychological factors (depression, anxiety and stress) with occupational stress among the respondents

v) There is a relationship between specific job factors (toxic exposure, physical isometric load and muscle ache) with occupational stress among respondents.

1.7 Definition of Terms

1.7.1 Conceptual definition

i) Prevalence

Prevalence is one of the two basic ways of describing the occurrence of disease in a population, which is a proportion of people in the entire population who are found to be with disease at the certain point of time, without regard to when they first got the disease. It includes new and existing cases or occurrences of diseases. (RERF, 2003).

ii) Occupational Stress

The harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources or needs of the worker (Sauter *et al.*, 1999).

iii) Depression

The condition characterized by persistent low mood, lack of positive affect and loss of interest in usually pleasurable activities.

iv) Anxiety

A feeling of apprehension and fear characterized by physical symptoms such as palpitations, sweating, irritability, and feelings of stress.

v) Stress

Stress is the adverse reaction people have to excessive pressure or other type of demand placed on them (HSE, 2004).

vi) Crane operator

The workers are responsible in handling containers for purposes in stacking and discharge containers from the vessel to the wharf or yard field.

vii) Port

The places where built beside a waterway with complete facilities that offer are services to keep, stacks, and load container to or from vessels.

1.7.2 Operational Definition

i) Prevalence

Prevalence of occupational stress can be determined from the number of workers who had been identified to be stress among the respondents

ii) Occupational Stress

The level of occupational stress among respondents acquired through Job Content Questionnaire (JCQ). The JCQ has been shown to be a valid and reliable instrument to assess job stress in many occupational settings worldwide. (Rusli,2006). The level of stress measured through working conditions that consist of two factors such as decision latitude and psychological job demand at work based on the job strain model. By using this instrument, information will be obtained based on the total score and the cut-off of mean during data collection.

iii) Depression, Anxiety and Stress

This will be based on Depression, Anxiety and Stress Scales (DASS), which focus on three psychological factors. This questionnaire will be used to measure the negative self-perceived emotional states of stress, anxiety and depression among the respondents. Each of the three DASS scales contains 7 - items.

CHAPTER 2

LITERATURE REVIEW

2.1 Definition of Stress

It is important to highlight that not all stress is negative or bad. For instance, Selye (1976) was conceptualized two categories, namely good or desirable stress (eustress) and bad or undesirable stress (distress). Eustress is pleasant, more challenging and can produce positive effects such as maximization of output and creativity. On the other hand, distress is evident when people perceive themselves as having no ability to control a stressful condition. Although everyone noticeable a response to stress, reactions vary widely across individuals.

2.2 Stresses in the Workplace

There are many opinions related to stress. Stress is a consequence of any physical, emotional, social, economic or other factors that require a response or

change of thing. Generally, stress occurs in amounts that human cannot handle and cope it. So, mental and physical changes also may effected. The workplace is an important source of both demands and pressures causing stress and structural and social resources to neutralize stress.

Stress may occur if there is a conflict between high job demands among workers and control with the job demands. Many situations in workplace can lead stress. The human body has a natural chemical response to a thread or demand, commonly known as the "flight or fight" reaction that includes the release of adrenaline. Once a threat or demand is over, the body can return to its natural state (NIOSH, 1999).

Many employees undergo stress as a normal part of their jobs, but some experience it more severe to the point that they need time away from work. The Bureau of Labor Statistics' Survey of Occupational Injuries and Illnesses classifies occupational stress as "neurotic reaction to stress" (Labor, 1999).

2.3 Sources of Occupational Stress

Sources of stress vary enormously. A source as known as a stressor can be elements that cause a stress reaction. A stressor is an event or set of conditions that causes a stress response. Stress is the body's physiological response to the stressor, and strain is the body's longer-term reaction to chronic stress. Generally, stress often

related directly to the work situation, like dealing with heavy and mechanical task or working in an uncomfortable environment among blue-collar workers.

Work onshore installation generally regarded as a stressful occupation. The workers are receiving stressors that are common to most workplace onshore. The physical stressors included noise, vibration, poor lighting, ventilation, adverse weather conditions, long working hours and shift work. Psychosocial stressors cover job characteristics such workload, variety, clarity and control (Chen *et al.*, 2008).

Based on a study in UK, 92.4% of workers find life at work stressful. The study was summarized that there are five top reasons related to high percentage of stress. The reasons are workload, lack of job satisfaction, not enough hours in the day and frustration with working environment, culture, and policies (Nina, 2008).

Various job situations may lead to the occupational stress. Occupational stress can rise up at the workplace setting due to several work environments that can cause job stress to workers:

i) The design of task itself can contribute to stress such as infrequent rest breaks, long work hours or shift work, do not utilize workers' skills and provide little sense of control.

ii) Stress can happen from workers himself. The workers with lack of participation in decision- making and poor communication in the organization.

iii) Interpersonal relationship plays a key role to avoid stress. The example are good social environment and support or help from coworkers and supervisors.

iv) Work demand can be an issue like uncertain job expectations and too much responsibilities.

v) Environmental condition such ergonomic problems, noise and air pollution can lead to job stress as well.

vi) When problems like personal and family issues brought to workplace, it could be more stressful add up with more job demand in workplace setting.

All these factors lead to the occupational stress that can be very harmful for workers. If the occupational stress goes on for a long time, then it can lead to severe illness in workers (Murphy, 1995).

2.4 Occupational Stress

Recently, occupational stress becomes one of the most serious issues and even more present decades ago in world populations (Lu *et al.*, 2003). Occupational stress is a significant problem over the industrialized world. The prevalence of occupational stress has been increased and the negative consequences of stress for individual health and well-being are increasing (McGowen *et al.*, 2006). Occupational stress has been an increasing concern for employers and governments for over 20 years (Fevre *et al.*, 2003).

Occupational stress is a part and package of the working environment and helps to keep the workers motivated. Stress can be describe as body response to physical and mental demands or interaction between environmental forces and events called stress precipitators which appear threatening to the person's reaction to the threat (Rogers, 1987). Occupational stress is anything regarding the working environment or nature of work itself that causes workers perceived stress (Rohany, 2003). Occupational stress is not related only to what goes on at work. Conflicts between the demands of the workplace and home life are increasingly common (Maxon, 1999).

Based on, sea transport service statistic, the employment decrease 4.7% from 2007 to 2009. From this percentage, it has shown that decrease work force but productivity keep increasing. In the safety and health issues occupational stress include in psychosocial hazard. As an employer, they must ensure that the worker is not exposed to any hazard in the workplace as required in Occupational Safety and Health Act (OSHA, 1994), so that the workers can work safely and can increase the productivity of the company thus lead to increase the development of the country.

According to World Top Container Port 2010 statistic ranking by TEU's, Malaysia in top 20 from 120 country that busiest terminal in container handling, which total TEU's is 8,872,000 in 2010 and 7,309,779 in 2009 total average from 2009 to 2010 is 21 % (North Port, 2010). The productivity is 25 moves per hour's means crane operator must load or discharge 25 containers per hour (Penang Port,

2011). In last year, Penang is the highest percentage in handling container approximately 15%. From the statistic, it clearly shown productivity in transport industry is increasing from time to time.

The statement takes out from port authority state that container handling at northern side region recorded a continuous growth in first quarter 2011. The growth is exponential increase 5.3% compared to the same period last year. During the period, the total container handled at Penang Port was 278,161 TEUs, compared to 264,060 TEUs in 2010 (Penang Port Commision, 2011). Despite these achievements, many accidents related to container handling happened. This job was very challenging, while an export and import of container operation is running.

Management of TEU's also giving a effect to occupational stress. In context of changes TEU's, by moving 4,427 TEU's (20-foot equivalent units) is considered high in container handling per day. For northern region, handling TEU's estimated as 3000 per day. It also busiest terminal because average of everyday around that numbers. The container terminal assumes that if the handling container less than 900 TEU's considered low traffic (Penang Port, 2011).

The unseen hazard for many workers is occupational stress. This condition occurs when increased burden, downsize, overtime, uncomfortable work environment and shift work. Occupational stress can affect worker's health when the

stressors of the workplace exceed the workers' ability to have some control over their situation or to handle in other ways (Kenneth Brynien *et al.*, 2006).

A study shows that incident occupational stress throughout the observation period proves higher proportions of mental health problems compared to those with decreasing occupational stress. The prevalence is about 50% of blue-collar workers in the continuously stressed group, particularly among men. If the experience of stress at work continuous over time, it will emerged occupational stress experience that associated with elevated risk of mental health (Isabelle *et al.*, 2005).

Previous studies have shown the health influences of occupational stress to the organizations, which can lead to economical loss up to billion dollars per year. If occupational stress affect a large numbers of workers, the healthiness of an organization by low workers performances, increase unsafe work practices and increase staff turn-over (Nina, 2007).

In National Occupational Health And Safety Commissions (NOHSC) Symposium, the speaker presented many cause of work stress which consist of physical and psychosocial stressors, stressful features of jobs, individual factors and lifestyle, gender differences, socio-economic status and job control, workplace violence, the role of the supervisor and emerging issues such as globalization and other pressures on worker (Drewry, 2001).

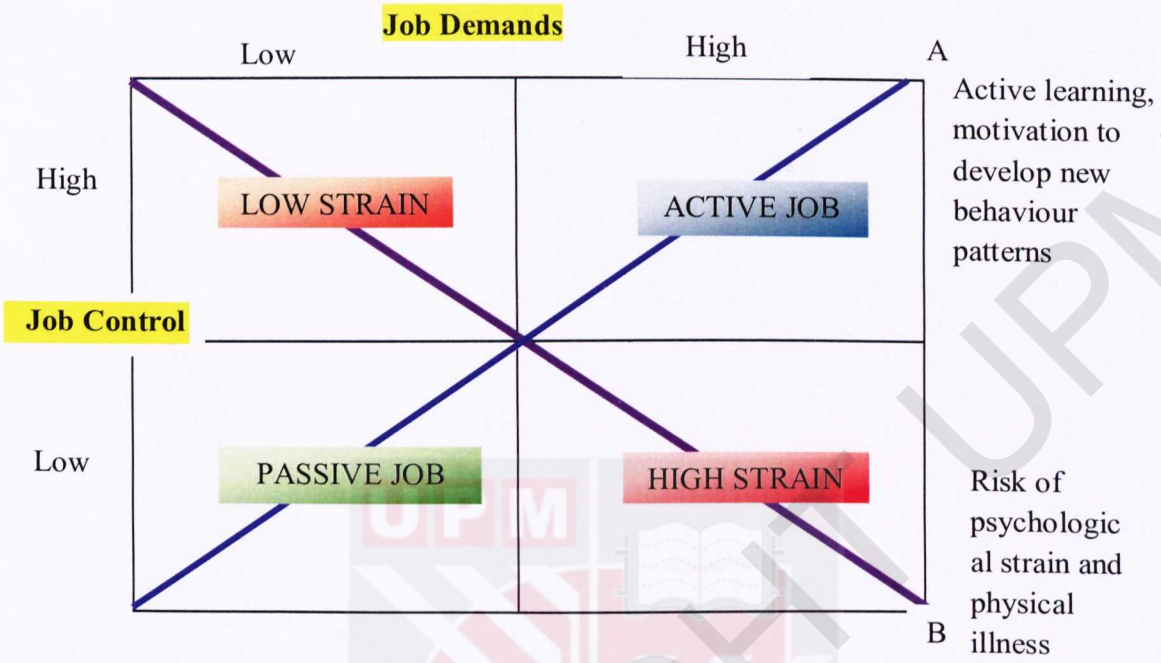
Recently, there were several studies have been conducted among nurses, teachers, clerks, laboratory technicians and automotive workers where occupational stress is directly associated with organizational factors (Rusli, 2004). However, there are few epidemiological studies conducted to examine the effects of occupational stress among Malaysian workers. Instead, there is no such figure to assess the loss due to occupational stress, but Ministry of Health Malaysia still believes that the number of occupationally related diseases increasing (Aziah *et al.*, 2004).

According to Karasek and groups (1998), generally there are four scales used to measure social and psychological characteristics, which will contribute to the occupational stress. The four domain scales included decision latitude (skill discretion and decision authority), psychological job demand, social support and job insecurity.

2.5 Stressors

From the analysis, review states that psychosocial work characteristics involve risk factors concerned with psychological processes related to the social environment of work that might be essential in the causation of illness. Based on Karasek review, he was described two key dimensions of the psychosocial work environment, psychological job demands and decision latitude (Stephen *et al.*, 2006).

Table 2.1 : Karasek - Demand-Control Model Of Job Stress



Source : Schnall et al.(2001)

In summary, jobs can be categorized into four types:

i. high-strain jobs (the most risky type of job)

- the condition shall be happened when the psychological demands of a job are high and the workers' decision latitude is low.
- fatigue, anxiety, depression and physical illness can be predicted

ii. Low-strain jobs

- A few psychological demands and high levels of control
- Predicted that low risk to get illness because decision latitude is low that allows the worker to respond optimally to these few job demands.

ii. Low-strain jobs

- A few psychological demands and high levels of control
- Predicted that low risk to get illness because decision latitude is low that allows the worker to respond optimally to these few job demands.

iii. Active jobs

- strongly demanding where as workers have sufficient control over their activities and the freedom to use available skills
- associated with only average psychological strain and active leisure time

iv. Passive job

- Can be labeled as low demands and low control
- Can stimulate worker to deteriorate their skills and abilities but psychological strain level in average range
- The workers were expected to get health risk

2.5.1 Decision Latitude

Following Karasek (1979), decision latitude defines as the degree of control a person has over their work. The psychological strain occurs when the psychological demands are high and the worker's decision latitude is low. In other words, Karasek (1998), stated that the quantity of work does not seem to be as essential to workers health as the interaction of workload with the amount of control or discretion the workers has over the work and related work processes.

Over the past decades, a large body of research by management scholars and social psychologists has frequently linked higher degrees of decision latitude and job autonomy to better work performance, satisfaction, well-being and motivation (Thomas *et al.*, 1990).

There are two components in decision latitude that is highly correlated which is skill discretion and decision authority. Skill discretion measured by a set of questions that assess the level of skill and creativity required on the job and the flexibility permitted the worker in deciding what skills to employ. Decision authority assesses the organizationally mediated possibilities for workers to make decision about their work. A question on skills required by the job allows assessment of skill under utilization (Karasek, 1998).

2.5.2 Psychological Job Demands

The psychological demand dimension relates to work overload, organization constraint on task completion, and conflicting demands. It also includes subscales such as general psychological demands and role ambiguity. Besides, concentration and mental work disruption subscales are additional specific measures of cognitive workload (Karasek, 1998).

Nowadays, issues of workload and work pace become significant important in an environment where working hours are increasing. In the United States, working couples have seen their average work year increase by nearly 700 hours in the past

two decades, and 30 percent of workers are exhausted by the end of the workday (NIOSH, 1999).

Crane operators are having a high level of job demands, especially before and after festival seasons like Chinese New Year, Hari Raya, Christmas and so forth, because they have to ensure in keeping up with the number of containers should be lifted up in certain period of time. Since the number of vessels increases and berthing schedule pack during certain particular of time, therefore, the job demands of the crane operators are further increased.

2.5.3 Social Support

Social support at work refers to positive, or helpful, social interaction available from supervisors, management and co-workers in the workplace (Karasek *et al.*, 1990). Social support is a third dimension in measuring the job characteristics.

Job strain closely related when demand of the job is high and the decision latitude is reduce at the same time. The risk of illness will increase when there is low social support in work. The subscale includes co-worker, supervisor socio-emotional, instrumental and hostility (Karasek *et al.*, 1990). Lack of social support from supervisor and co-workers in the workplace could further enhance the effects of job strain.

2.5.4 Job Insecurity

Insecurity about successful performance and fear of negative consequences resulting from performance failure may remind great negative emotions of anxiety, anger and irritation. Job insecurity depends on the labor market requirement for particular skill and limited future career development possibilities (Karasek, 1998).

In the previous study, the researcher questioned workers about major sources of stress and found that high workload, poor status and poor pay emerged as the major sources of stress (Jarvis, 2002). Work's psychological burden consists not only of the work of carrying out the task but also in the human costs of adapting to labor market dynamics. These are increasingly important in the last several years, because the global economy has had job-displacing effects in many countries and increased reported job insecurity (Lohr *et al.*, 1996).

2.6 Depression, Anxiety and Stress

Employees are commonly faced with greater demands and less job security, both of which are likely to be stressful, thus psychological disorders especially depression may increasingly be caused by work-related stressors. Stress, anxiety and depression have been recognized as important outcome measures in various work environments (Benneth *et al.,* 2004). Plaisier *et al.* (2007) suggested that poor working conditions might be an important precursor of stress. Therefore, it contributes to the development of depression or anxiety. There are abundant studies

exploring the relationship between working conditions and stress, anxiety and depression (Wang *et al.*, 2001).

Following an increasing cost of work in the global economy in 2001, there are many increasing of mental strain, depression, and mood by country. There are four countries that having this problem which are Netherlands, Sweden, United States and Denmark. The percentages are 36%, 27%, 27% and 35% (Karasek, 2005).

Stress is perception of an imbalance between the demands made and available resources to match them. The point is that when it persists, it may cause physical and psychological ill health (Edwin *et al.*, 2001). In the other words, stress refers to the body's response to situations that pose demands, constraints or opportunities (Bryce, 2001). Higher levels of stressors were lead to physical symptoms, such as headaches and poor job attitude (Spector, 2002).

Based on survey of occupational injuries and illnesses, for anxiety and stress, private industry reported an overall incidence rate of 0.6 per 10,000 full-time workers in 2001. Higher rates were reported for transportation and public utilities (1.1), finance, insurance and real estate (1.1), and services (0.7). Container handling also includes in services (BLS, 2003).

There is a significant research effort attempting the relationship between occupational stress and disease (Seward, 2007). The short-term stress can lead to emotional distress, stomach disorder, headache, sleepless and loss of energy. For the

long term, it can cause serious illness and even premature death, most likely due to cardiovascular disease (Spector, 2002).

Depression is a major public health problem. It tends to have a chronic course, produces disability, and is associated with suicide. Recent studies have found that depression also leads to significant loss of productivity mainly due to reduced performance rather than absence from work. Identifying individuals at high risk for epression is considered a priority. It has been shown that work stress is an independent predictor of depression.

Major depression has significant impacts on workers' productivity. Research has shown that work stress or job strain is an important risk factor for developing major depression (Wang *et al.*, 2005). Conceptually, reduced work stress or job strain should lead to lowered risk of major depression.

According to Indonesian Medical Chairman, the population of Indonesian suffered depression increasingly from last year of 2006. The latest survey is being done conclude that approximately show 94% of their population having depression (Bernama, 2007). The Ninth Malaysia Plan focused on these problems and drafted a plan to deal with the problem. Minister of health state that depression will be second major cause of death in Malaysia over next 10 years if not well treated (Bernama, 2005). A new study does for approach association between depression and diabetes.

The result is high prevalence can has adverse consequences. The two variables are strongly linked with increasing mortality (Press Trust India, 2011).

2.7 Relationship between Psychological Factors with Occupational stress

There is evidence from both cross-sectional and longitudinal studies states that high levels of psychological demands, including fast work pace and high job demands are predictive of common mental disorders. Commonly, mild-to-moderate symptoms, depressive and anxiety disorders are frequent happens in the general population. It also can be identified by screening questionnaires (Stephen *et al.*,2006).

Occupational stress plays an important role in some types of chronic health problems such as cardiovascular diseases, musculoskeletal disorders and psychological illness (Rusli, 2006). Recent survey within the construction industry which identified that 68.2% of respondents within their sample, had suffered from stress, anxiety or depression (Chartered Institute of Building (CIOB), 2006). According to Smith, long-term stress traumatic events at work can cause mental illness, anxiety and depression resulting in absenteeism from work and preventing the worker from being able to work again. In addition, high occupational stress is strongly relates to gastrointestinal problems, mental disorder and substance abuse and hypertension.

Stress has been focus of attention for several years among various professional groups including social work. However, only limited attention has been given to stress experienced by gantry crane operator and even less to rubber tyred gantry cranes operators. There are strong theoretical arguments that the individual worker's emotional and cognitive perception and processing of working conditions constitute an essential causal link between the working environment and depression (Lazarus *et al.*, 1997).

The productivity and ability to function in workplace will be effectively caused by depression. It also affects a quality of life and job performance during work (Marcus *et al.*, 2004). Typical symptoms of depression like inability to concentrate fully or to make decisions can lead to injuries, mistakes and accidents (Drake *et al.*, 2006).

The earlier research done used to highlight which occupation has highest rates of self-reported poorer mental health. As the result, there are ten occupations with highest prevalence rate belongs to construction industry. The four occupations that have high prevalence of occupational stress are crane operators, public workers, laborers in processing, manufacturing and utilities and trades helpers (Alberta Health Services, 2010). In a study, shows that results indicate that job stress may play a significant role in increasing the risk of depressive symptoms and that further preventive efforts and research are need to reduce job stress and address health problems caused by job stress among Korean employees (Park *et al.*, 2008).

However, there are few epidemiological studies conducted to examine the effects of occupational stress among Malaysian workers. Instead, there is no such figure to assess the loss due to occupational stress, but Ministry of Health Malaysia still believes that the number of occupationally related diseases increasing (Aziah *et al.*, 2004).

For the job specific factors comprised of toxic exposure, physical isometric load and muscle ache. The job specific factor related to daily activity of crane operator himself. These factors come from their job itself. It more focuses on exposure during work.

2.8 Relationship between Specific Job Factors with Occupational Stress

2.8.1 Toxic Exposures

Toxic defined as a condition or disease that gives severe and progressive related to poison (Mosby's Medical Dictionary, 2009). Toxic exposure is capable of causing injury or death, especially by chemical means whether acute or chronic effect. Hazard refers to the effect on body systems under condition of use. People that work as crane operators also expose to toxic substances. Sometimes, the workers will open up cabin crane's window during vessel berthing. For instance, if there was a small amount of some toxic substance from ship smoke, then the effect might be build up over time.

There are several chemical hazards indirectly exposed to crane operators such combustion of diesel from flue ship and fume from burning. From the toxic exposure, the workers tend to get occupational asthma, dermatitis and skin irritation. (John *et al.*, 2001). While vessel berthing, it still produced emission smoke. All of ship, oil tanker and container vessel use diesel oil as combustion product.

The diesel exhaust from ship has been classified by EPA as a likely human carcinogen. EPA recognizes that these emissions from marine diesel engines contribute to ozone and carbon monoxide, which is failure to comply air quality standard. As well as adverse health effects associated with ambient concentrations of particulate matter. (EPA, 2003). By 2010, up to 40 percent of air pollution over land could come from ship. Sulfur that suspended in air creates acid rain, which damage equipments and buildings. When the workers inhaled the sulfur, it cause respiratory problems and increases the risk of heart attack (Harrabin, 2003).

The previous study shows the contribution of ships to fine particulates in the atmosphere is very significant. The study found that contribution from ships of solid sulphur-rich particles called primary sulphate (SO_4) would be so high. It is harmful because they stay in the atmosphere for longer periods and particles that are removed by the body when breathed, remain in the lungs (Highfield, 2008).

2.8.2 Physical Isometric Loads

Regarding to work activities, crane operators are exposed to physical demands that may put them at risk of musculoskeletal discomfort (MSD) such sustained and constrained arm and hand postures of bilateral joystick operation, in conjunction with a range of head up and head down (Edwin *et al.*, 2008).

In accordance with United Kingdom field study into musculoskeletal risk factors in dock crane drivers reported *'an increasing number of crane drivers reporting musculoskeletal problems'*. For the three main dock crane types - quayside cranes, rubber-tyred gantries, and straddle carriers. In addition, Carayon *et al.*(1999) reviewed work organization, job stress, work related musculoskeletal disorders and concluded that work organization and psychosocial factors at work could contribute to upper extremity disorders.

2.8.3 Muscle Ache

Muscle ache are classify under Musculoskeletal Disorder (MSD). The exposures included repetitive work, static loading, neck flexion, force and occupational psychosocial factors. Muscle ache related to low back pain syndrome or specific paraspinal muscle strained. The prevalence and incidence of muscle ache happens among crane operators is common. It occurs while the worker in an abnormal posturing or sudden movement from the actual position (DynaMed, 2011).

According to Health Safety Executive (HSE) states, the main bodies that will affected among crane drivers are lower back, neck and shoulder. Prevalence related musculoskeletal disorder (MSD) for crane operators as 44-77% neck, 44-64% shoulder and 67-86% lower back problems (HSE, 2009). MSD in crane operators clearly recognized as a known risk area by this organization with enlighten that an 'associated hazard' while dealing with load on or load off container.

2.9 Effect of Occupational Stress

The latest studies have all pointed out that occupational stress plays a major role in the health problems, occupational dissatisfaction and lead to burnout syndrome. For instance, both diminished general health and mental health scores have been related to perceived occupational stress. Work stress has been single out as the risk factor with the highest relevance for poor health. The harmful effects of occupational stress are not only are not only one of the most leading concerns for both individual and organizations, but also one of the most costly occupational health issues (Cooper *et al.*, 1996).

Other evidence of adverse effects on health include psychiatric disorders, psychosomatic symptoms, menstrual patterns and in extreme cases, suicide. In addition to a plethora of health consequences, job stress negatively affects work satisfaction and organizational commitment which could further reduce worker retention rates.

2.9.1 The Effect of Occupational Stress on Individuals

In spite of beneficial effect of work, an unfavorable psychosocial working environment also poses a threat to the mental health of workers. The exposure to low-level stressors is not likely to lead to harm to workers. When stressful situations were unresolved, the body kept in a constant state of stimulation, which can result in physiological or psychological changes and illness. Stress affects different people in different ways. There have a clear relationship between health effect and stress and it affects our body in many ways.

According to WHO (1999), the experience of work and caused the poor physical and mental health. Many consequences related to changes to normal bodily functioning. Numerous studies have linked occupational stress to physical and psychological illness. Four main factors play a role in occupational stress :

i) Physical : headaches, indigestion, tiredness, slow reactions, shortness of breath

ii) Mental : difficulty in decision-making, forgetfulness

iii) Emotional : irritability, excess worrying, feeling of worthlessness, anxiety, defensiveness, anger, mood swings

iv) Behavioral: diminished performance, withdrawal behaviour, impulsive behaviour, increase in alcohol and nicotine consumption

Common longer-term health issues linked to stress include cardiovascular disease (CVD), immune deficiency disorders, gastrointestinal disorders, psychiatric or psychological illness (PPI), increases in blood pressure and musculoskeletal disorders (John *et al.*, 2007).

When workers affected by work related stress, they may increasingly distressed and irritable, unable to relax or concentrate, have difficultly thinking logically and making decision, focus their work less and feel less committed, feeling tired, depressed, anxious and having difficulty sleeping (Michie, 2002).

2.9.2 The Effect of Occupational Stress on Organization

Stress is a factor that needs to be recognized by the company. Occupational stress may challenge the healthiness and performance if the organization is a large numbers of workers are being occupational stress. Unhealthy organizations do not get the best from their employers and this may affect not only their performance in the increasingly competitive market but eventually even their survival (WHO, 1999). This may affect group performance due to cost related with increases absenteeism and staff turnover, reduced performance and productivity, increased unsafe working practices and accident rates, increased complaints from clients or customers, substitute workers and training of replacement workers (WHO, 2007).

Increased stress levels of workers in an organization can lead to weaken organizational performance. Work related stress will affect organization by increasing absenteeism, decreasing commitment to work, increasing staff turn-over, increasing complaints from shipping clients and agents, increasing unsafe working practice, adversely affect staff recruitment, productivity and efficiency may be reduced, damaging the organization image both among its workers and externally (Leka, 2003)

CHAPTER 3

METHODOLOGY

3.1 Study Design

This was a cross sectional study.

3.2 Study Location

The location of this study was at the Container Terminal, Penang Port. This location was chosen because there is only one container terminal at the northern region of Peninsular Malaysia, which is located in Penang. Container terminal is an open place where all of activities involved with loading and unloading cargoes are performed and supported by heavy machinery such prime mover (PM), Rubber-Tyred gantry (RTG) and Quay Gantry Crane (QGC). The crane operator's job task is divided into two main areas of the container terminal, which are the vessel operation area and the yard operation area. The recent annual container output is one million TEU's.

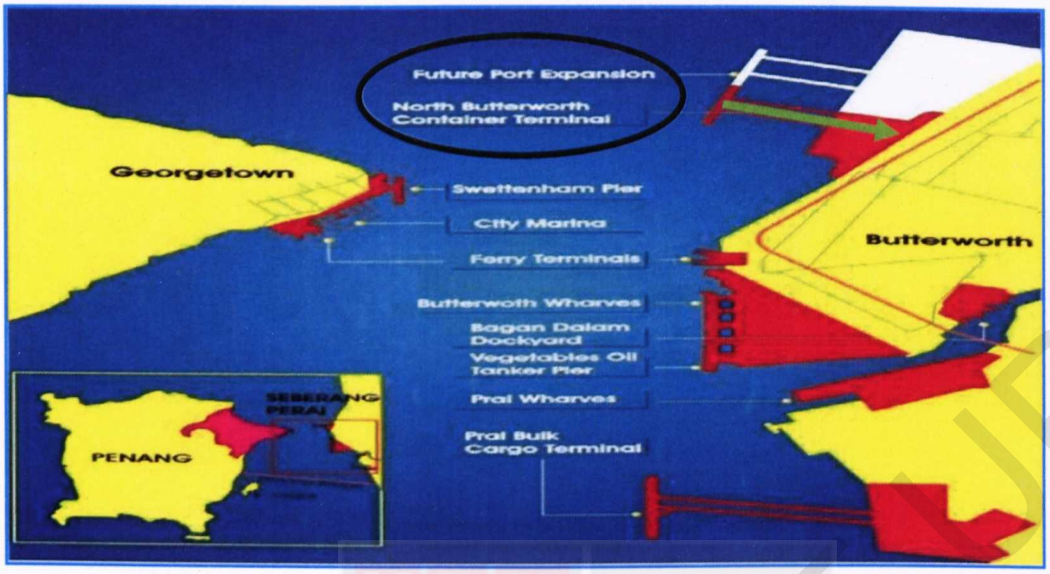


Figure 3.1 : Location of study sampling which is container terminal Penang

Source : Penang Port (2011).

3.3 Sampling

3.3.1 Study population

The study population included all crane operators working at the Northern Region Container Terminal of the Penang Port.

3.3.2 Study sample

The study sample consisted of workers who fulfilled the selection criteria (inclusion and exclusion criteria) of the study.

Inclusion criteria:

- Crane operator who are present and available during the data collection period will recruited to the study
- Age from 30 to 58 years old
- Crane operators who complete the cycle of work which from driving Prime Movers to Rubber Tyred Gantry to Quay Gantry Crane

Exclusion criteria:

- Crane operator who has physical or mental illness

3.3.3 Sampling frame

The sampling frame included the name list of crane operators working at the container terminal, which was obtained from the port administration department.

3.3.4 Sampling unit

The sample unit for this study was the crane operators who fulfilled the selection criteria.

3.3.5 Sampling method

Universal sampling was done. All crane operators who were available during the data collection period and agreed to participate in the study were included.

3.3.6 Sample size

In epidemiological studies, recruitment of enough samples for the study is very crucial. The sample size must be adequate so that the results will be precise. Based on the research done by Noor Hassim *et al.* (2006), the prevalence of occupational stress among Malaysian workers was 45%. This study's sample was calculated based on the formula of Kirkwood B. R. (2003) as below:

$$N = \frac{p(1-p)}{e^2}$$

Where , N : Sample size

p : 45% prevalence of stress among Malaysian workers

e^2 : standard error (5%) ; 95% probability

$$N = \frac{0.45(1-0.45)}{0.05^2}$$

= **99 workers**

Based on the calculation done above, the minimum sample size for this study is 99 workers. An addition of 20% was made to overcome the problem of non-responses (Edimansyah *et al.*,2008). An addition of 5% in missing data or exclusion data was also done (Jumlong *et al.*,2011).

Hence, the sample size calculated was **126 respondents.**

3.4 Variables

3.4.1 Dependent variables

The dependant variables in this study were:

- Occupational Stress (high strain and non-high strain)

3.4.2 Independent variables

The independent variables in this study were:

i. Depression

ii. Anxiety

iii. Stress

iv. Organizational Factors

- Decision latitude
- Psychological job demand
- Social support
- Job insecurity

v. Socio-demographic factors

- Age
- Race
- Education level
- Marital status
- Monthly income
- Duration of employment

vi. Specific job factors

- Toxic exposure
- Physical isometric load
- Muscle ache

3.5 Data Collection and Study instrumentation

The study population was crane operators working in the container terminal at the Penang Port.

3.5.1 Data collection

A name list of all crane operators was obtained from the administration department of container terminal. All workers fulfilling the selection criteria were approached to take part in the study. The researcher collected data everyday from 15 January to 16 February 2012 from 9 am to 5 pm.

When the crane operators started their work, they were divided into four teams and will continue working in the same team until they retire. The researcher approached the crane operators based on their groups. One crane operator was selected randomly as a group leader to assist the researcher in the data collection process. The leader made appointments with the other crane operators to meet the researcher on certain dates for data collection. The researcher herself conducted the data collection with each respondent.

Each respondent was given a call by the researcher to confirm the appointment and time of meeting. The respondent read that information sheet and signed the consent letter. The researcher provided information about the study and the questionnaires were passed to the respondent. All questionnaires were self-administered. Each questionnaire consisted of questions on socio-demographic factors, Job Content Questionnaire (JCQ) and the 21-item Depression Anxiety Stress Scales (DASS) Questionnaire.

The respondents answered the questionnaires facing the researcher. The data collection was conducted in the gantry operator's rest room and logistic office. The respondents were also provided a feedback form to inquire if they wanted to know their results from the study. Figure 3.1 shows the data collection process of this study.

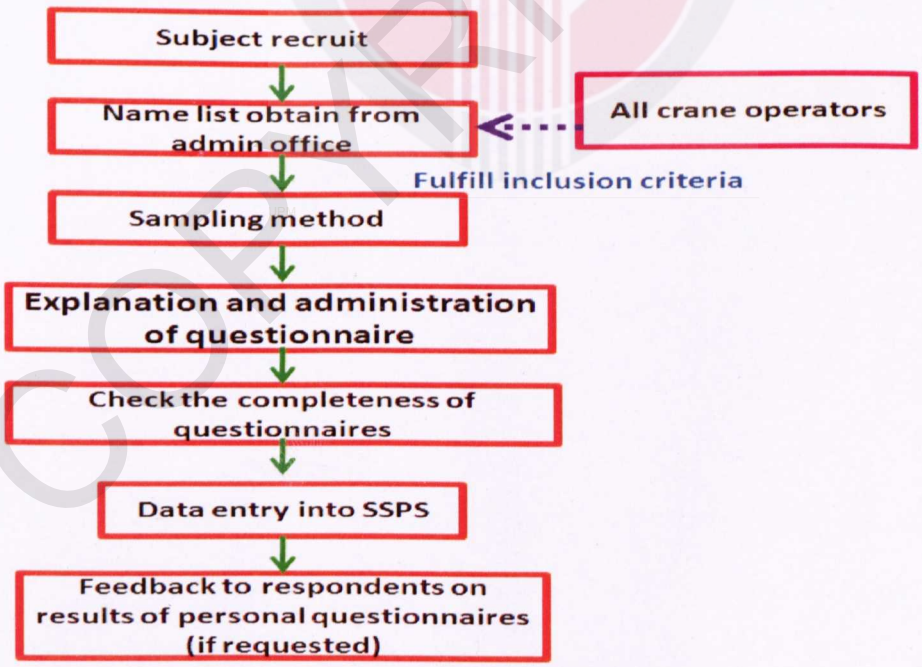


Figure 3.2 : Data collection flowchart of this study

3.5.2 Study Instrumentation

3.5.2.1 Questionnaire

The instrument for data collection in this study was the self-administered questionnaire, which consisted of three main sections; which were (1) socio-demographic factors, (2) Job Content Questionnaire (JCQ) and (3) Depression Anxiety Stress Scales (DASS-21).

(1) Socio-demographic factors

The socio-demographic factors obtained from the respondents in the study included age, race, gender, education level, marital status, monthly income and duration of employment.

(2) Job Content Questionnaire (JCQ)

The Job Content Questionnaire (JCQ) is a well-known research instrument and is the most widely used questionnaire in studying occupational stress factors. It has been translated into over 12 languages (Joanna *et al.*, 2002). The psychosocial aspects of occupational stress have been evaluated using the Job Content Questionnaire (JCQ) based on Robert Karasek's demand-control model.

The validated Bahasa Malaysia version of the JCQ has been used to determine occupational stress among assembly automotive factory workers in Malaysia (Edimansyah, 2006). The Bahasa Malaysia version was validated by Rusli (2006)

and was found to have good reliability for decision latitude (0.75), psychological job demand (0.61) and social support (0.84).The reliability and validity of the Bahasa Malaysia version of the JCQ has also been tested among secondary school teachers in Kota Bharu, Kelantan (Azlihanis, 2006). Permission to use this questionnaire was obtained from the respective copyright holder (Rusli Nov,2011).

The Job Content Questionnaire (JCQ) contains two sub categories that include the physical and psychology stress sub-category has 18 items and the psychosocial sub category, which has 71 items. These items domains, which cover 4 mains include psychological demand (job demand), decision latitude (job control), job insecurity and social support. The items are scored on a Likert scale of 1 to 4 (strongly disagree, disagree, agree and strongly agree; or often, sometimes, rarely and never).

All variables are calculated using the formula for Job Content instrument scale construction provided in the Job Content Questionnaire and User Guide (Karasek, 1985). The median cut off point for each domain or variables was used to determine whether the respondents had occupational stress. Refer to Table 3.1 for the four domain (decision latitude, psychological job demand, job insecurity and social support) and the items which contribute to each domain.

Table 3.1: Formula for Job Content Instrument Scale Construction

Independent variables	Questions used to create the variables
(I) Four main domain acts as organizational factors	
(a) Decision latitude (DL)	Skill discretion = [Q3 + Q5 +Q7+Q9+Q11+ (5-Q4)] x 4
i) Decision Authority	Decision Authority = [Q6 + Q10 + (5 – Q8)] x 4
ii) Skill discretion	**DL = Skill discretion + Decision Authority**
(b) Psychological Job Demand (PJD)	Psychological Job Demand = { (Q19 + Q20) 3 + [15 – (Q22 + Q23 + Q26)] 2 }
(c) Social support (SS)	Co-worker support =[Q53 + Q54 + Q58]
i) Co-worker support	Supervisor support= = [Q48 + Q49 + Q51 + Q52]
ii) Supervisor support	**SS = co-worker support + supervisor support**
(d) Job Insecurity (JI)	**Job Insecurity** = [Q33 + Q36 + (5-Q34)]
(II) Three domain acts as specific job factors	
(a) Toxic Exposures	**Toxic Exposures** = [Q39 + Q40 + Q43]
(b) Physical Isometric Loads	**Physical Isometric Loads**= [Q30 + Q31]
(c) Muscle Aches	**Muscle Aches** = [V7 + V8]

Source : Rusli (2011).

(3) Depression Anxiety Stress Scales (DASS 21-item)

The DASS 21-item is a self-report questionnaire that has 21 questions. It was designed to measure the severity of symptoms common in depression, anxiety and stress. The DASS 21-item scale was used in this study and is the shorter version from

the DASS 42-item (Lovibond *et al.*, 1995). The reason for choosing the DASS 21-item is because it is suitable for research purposes and for DASS 42-item was used for clinical work (Henry *et al.*, 2005).

A key strength of the DASS is its ability to assess depression, anxiety and stress in a brief and psychometrically sound manner (Brown *et al.*, 1996) The essential function of the DASS-21 is to assess the severity of the core symptoms of Depression Anxiety and Stress. The questionnaire is easy and simple to administer to general population without any special training is needed (Ramli *et al*, 2007)

A validated Bahasa Malaysia version of Depression Anxiety Stress Scales 21-item (DASS-21) was used in this study. The Bahasa Malaysia DASS-21 had very good Cronbach's alpha values of 0.81, 0.85 and 0.85, respectively for depression, anxiety and stress subscales. These results established the fact that the Bahasa Malaysia DASS 21-items had excellent psychometric properties and is suitable to be used for the Malaysian population (Musa, 2009). Permission to use this questionnaire was obtained from the respective copyright holder (Ramli *et al.*, 2011).

All questions were scored in the Likert scale. There are four scores in the DASS-21, which are 0 = Did not apply to me at all, 1 = Applied to me to some degree, or some of the time, 2 = Applied to me a considerable degree and 3 = Applied to me very much. Refer to Table 3.2 for the DASS-21 severity rating scale.

Table 3.2: DASS-21 Severity Ratings

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Sources : Ramli (2011).

3.6 Data Analysis

Data were entered into the Statistical Package for Social Science (SPSS) Version 19.0. This program is suitable for analysis of social science data from questionnaires. Responses were entered according to codes. After the data entry was completed, data was double checked again and cleaning data was done. Checking for errors and making corrections were made. The checking for missing data, typing and coding error, and outlier was also done. This was conducted via descriptive statistics and histograms (Broeck, 2005).

Reliability testing was done using Cronbach Alpha for Job Content Questionnaire (JCQ) and Depression Anxiety Stress Scales 21-item (DASS-21). Reliability test is a measure of internal consistency of the study instrument. The range of Cronbach Alpha coefficient is 0 to 1. An instrument is considered to be reliable if the Cronbach Alpha is at least 0.70 which, means that scale instrument is acceptable (George *et al.*, 2001).

According to Nunnally et *al.*, (1994), Cronbach coefficient usually provides a good estimate of reliability because of its sensitivity toward the item content and sampling situational factors. A Cronbach's alpha values greater than .80 indicates good internal consistency (Sanchez *et al.*, 2004) and could be seen to be most reliable (Ma *et al.*,2006). According to Streiner (2003), the higher the value, the better it is and the recommended value is .90 means very good value.

Descriptive statistics was used to summarize or describe the data in this study. This included measures of central tendencies (mode, median, mean) and measures of dispersion (range, standard deviation).

The chi-square test of independence was used to determine the association between the dependant and independent variables, which were the relationship between occupational stress with socio-demography factors, organizational factors (psychological demand decision latitude, job insecurity and social support), psychological factors (depression, anxiety and stress), and specific job factors (toxic exposure, physical isometric load and muscle ache). The relationship were considered to be significant at a value of $p<0.05$.

Multiple logistic regressions was also used to determine the predicting factors for occupational stress among respondents in this study. Dependent variables found to be significantly relationship with occupational stress from the chi-square analysis were further tested to determine their predicting outcomes for occupational

stress using the backward logistic regression method. The result was interpreted using p-value, confidence interval (CI) and odd ratio (OR). Two-sided hypothesis testing was applied for all tests.

3.7 Quality Control

3.7.1 Questionnaires

Quality assurance and quality control are defined as those aspects, which followed policy and practice, to ensure that all test results are reported accurately. Explanation about the aim of the study and questionnaires administered was provided to the respondents during data collection. Further clarification of the questions in the questionnaire was given if the respondents did not understand the questions. The questionnaire was in Bahasa Malaysia version because all the crane operators were Malaysian. The validated Bahasa Malaysia versions of both the JCQ and DASS were used.

A pre-test of each questionnaire (JCQ and DASS) was performed on 10% of the sample size to ensure the feasibility of the questionnaires. The pre-test was important to make sure that the questionnaires were suitable in this study. Analysis of the pre-test questionnaires found a Cronbach's alpha of .85, which should that the questionnaires was reliable. Some modifications and corrections were made to questions, which the respondents had differently in understanding.

3.8 Study Ethics

i. Permission from employer of the company where the study was conduct was obtained. (Appendix 1)

ii. Ethical approval was obtained from Medical Research Ethics Committee of the Faculty of Medical and Health Science, Universiti Putra Malaysia was also obtained. (Appendix 2)

iii. '*Pengakuan Bersumpah'* was also made before obtaining permission from the organization management "Corporate Strategic Unit Human Resources, Penang Port". (Appendix 3)

iv. Written consents were obtained from the respondents prior to the study. (Appendix 4)

Note: The respondents were assured of their privacy and confidentially of all information provided in this study.

CHAPTER 4

RESULTS

4.1 Response Rate

In this study, two hundred and forty crane operators were approached. All of them agreed to participate in this study, completed the questionnaires and the response rate was a hundred percent (100%). This excellent response rate was achieved due to the good collaboration between the organization, its workers and the researcher.

4.2 Socio-Demographic Characteristics of Respondents

The first objective of the study was to determine the socio-demographic characteristics of respondents, which were age, ethnicity, marital status, education background, monthly income, and duration of employment.

Table 4.1 (a) and 4.1 (b) show the distribution of socio-demographic characteristics of the respondents. The largest ethnicity was Malay (92.5%). The married respondents were 99.2% of the total respondents. More than half of the respondents were in the age range of 40 to 49 years old (53.3%). The mean for monthly income was RM 1985 ± 431.6. For duration of employment, 75% of the respondents were between 1 to 10 years of employment. More than half (53.8%) of the respondents had completed upper secondary school.

Table 4.1(a): Distribution of socio-demographic characteristics among respondents (N=240)

Socio-Demographic Characteristics	Mean ± SD	n (%)
Age	45 ± 6.377 years	
30-39		46(19.2)
40-49		128(53.3)
50 and above		66(27.5)
Monthly Income	RM 1985 ± 431.635	
1260-1699		76(31.7)
1700-2099		52(21.7)
2100-2499		76(31.7)
2500 and above		36(15.0)
Duration of employment	8 years ± 5.277	
1-10 years		180(75.0)
11-20 years		56(23.3)
21 years and above		4(1.7)

Table 4.1(b): Distribution of socio-demographic characteristics among respondents (N=240)

Socio-Demographic Characteristics	n (%)
Ethnicity	
Malay	222(92.5)
Chinese	1(0.4)
Indian	17(7.1)
Marital Status	
Single	2(0.8)
Married	238(99.2)
Education Background	
Primary School	2(0.8)
Lower Secondary School (PMR)	103(42.9)
Upper Secondary School (SPM)	129(53.8)
High School (STPM)	5(2.1)
Diploma	1(0.4)

4.3 Organizational Factors

The organizational factors were determined from the four main domains in the Job Content Questionnaire (JCQ); which were

i. decision latitude

ii. psychological job demands

iii. social support

iv. job insecurity

The scores and range for each domain of the organizational factors are described as in Figures 4.1, 4.2, 4.3 and 4.4.

4.3.1 Decision Latitude

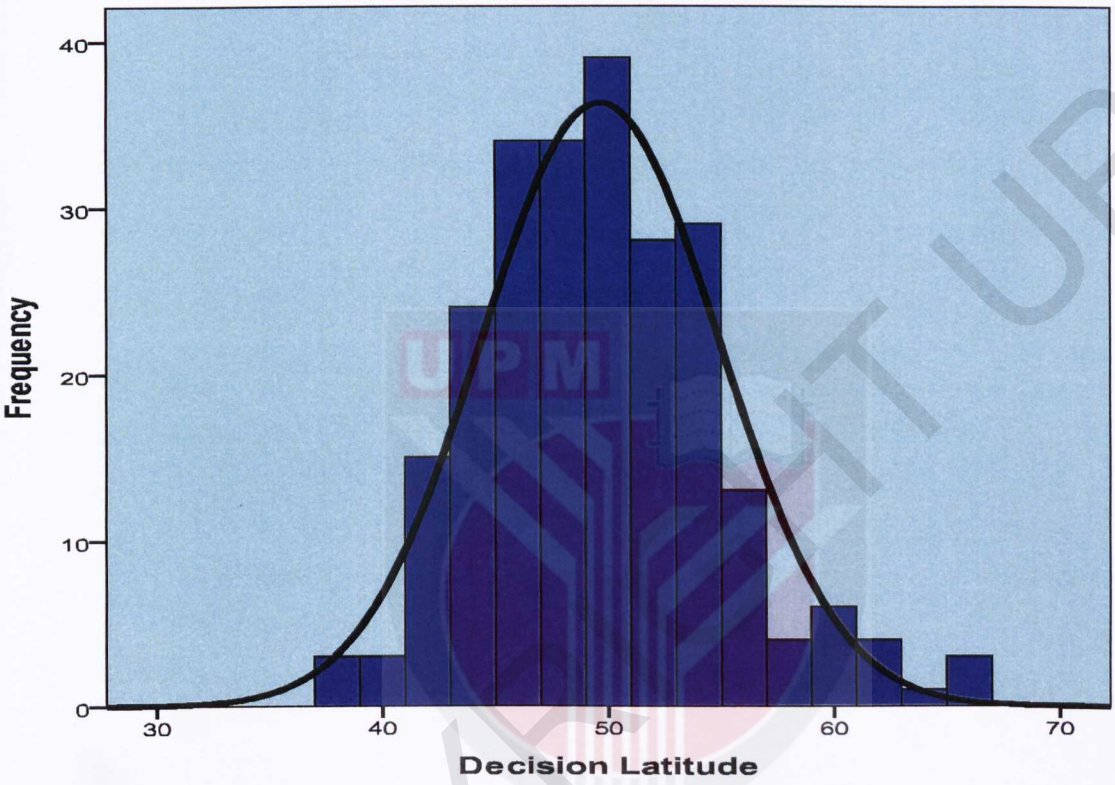


Figure 4.1: Score of decision latitude among respondents (N=240)

As shown in Table 3.1 (in page 47) skill discretion and decision authority were grouped together to obtain decision latitude. The scores for decision latitude among the respondents are presented in Figure 4.1. The minimum score was 38 and maximum score was 66, with a range of 28. The mean was 49.66 and standard deviation was 5.165. Respondents with scores of more than 50, based on the median

cut off point were considered to have low decision latitude and predicted to be more stressed.

A total of 162 of the respondents had low decision latitude (67.5%). The low level of decision latitude indicated that the respondents did not have control over their job tasks and were not able to make their own decisions. The mode score of the respondents was 50, which meant that most of the respondents had average scores.

4.3.2 Psychological Job Demands

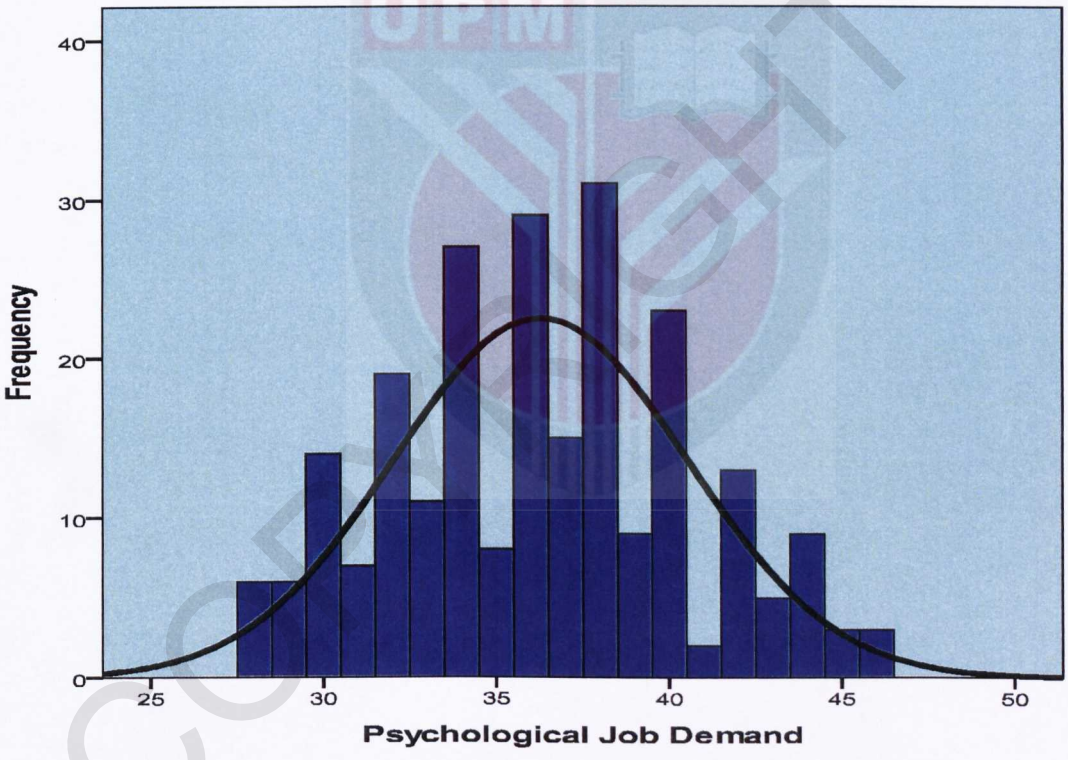


Figure 4.2: Score of psychological job demands among respondents (N=240)

The scores for psychological job demands among respondents are summarized in Figure 4.2. The minimum score was 28 and maximum score was 46

with a range of 18. The mean was 36.28 and standard deviation was 4.212. Respondents with scores of more than 36 (median cut off point) were considered to have high psychological job demands and predicted to be more stressed.

A total of 155 (64.6%) of the respondents had high psychological job demands (Table 4.2). The high level of psychological job demands indicated that the respondents need to fulfill duties, commitments and responsibilities during their working timeline. The mode score of psychological job demands was 38, which meant that most of the respondents had average scores.

4.3.3 Social Support

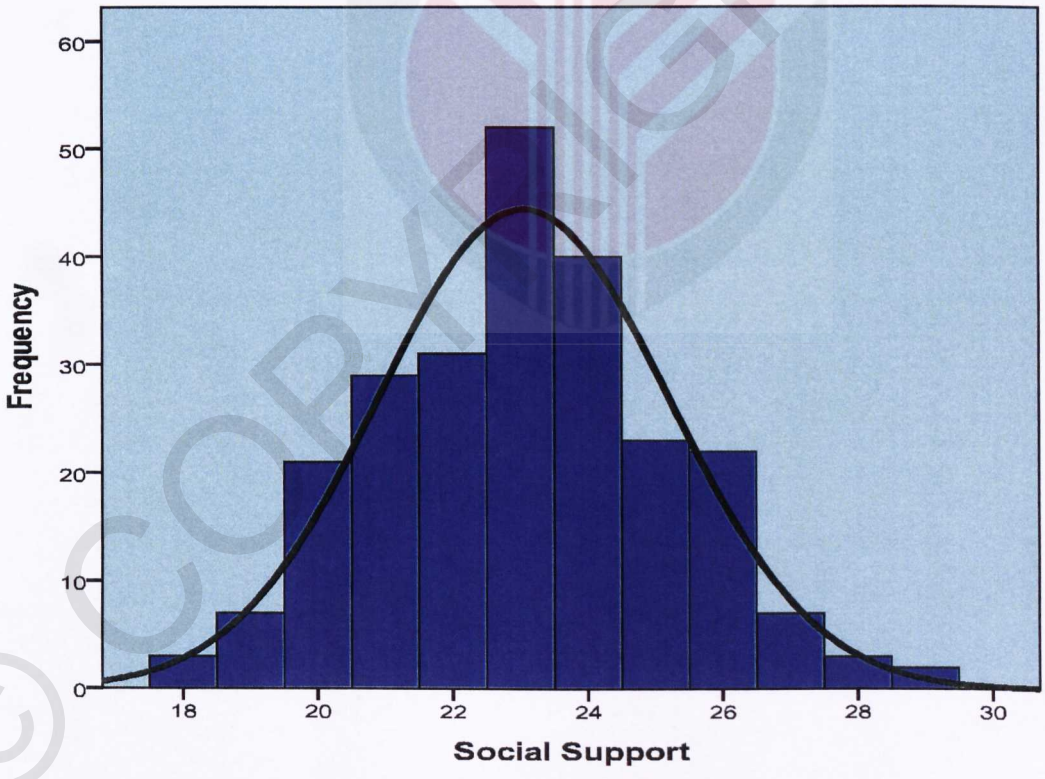


Figure 4.3: Score of social support among respondents (N=240)

Social support was determined from co-workers' and supervisors' support as shown in Table 3.1 (in page 47). The scores for social support among respondents are summarized in Figure 4.3. The minimum score was 18 and maximum score was 29, with a range of 11. The mean was 23 and standard deviation was 2.181. Respondents with scores of more than 23 (median cut off point) were considered to have low social support and predicted to be more stressed.

A total of 140 of respondents had low social support (58.3%). The low level of social support indicated that the respondents were having less support from their superiors, management, and co-workers in the workplace. The mode score of social support was 23.

4.3.4 Job Insecurity

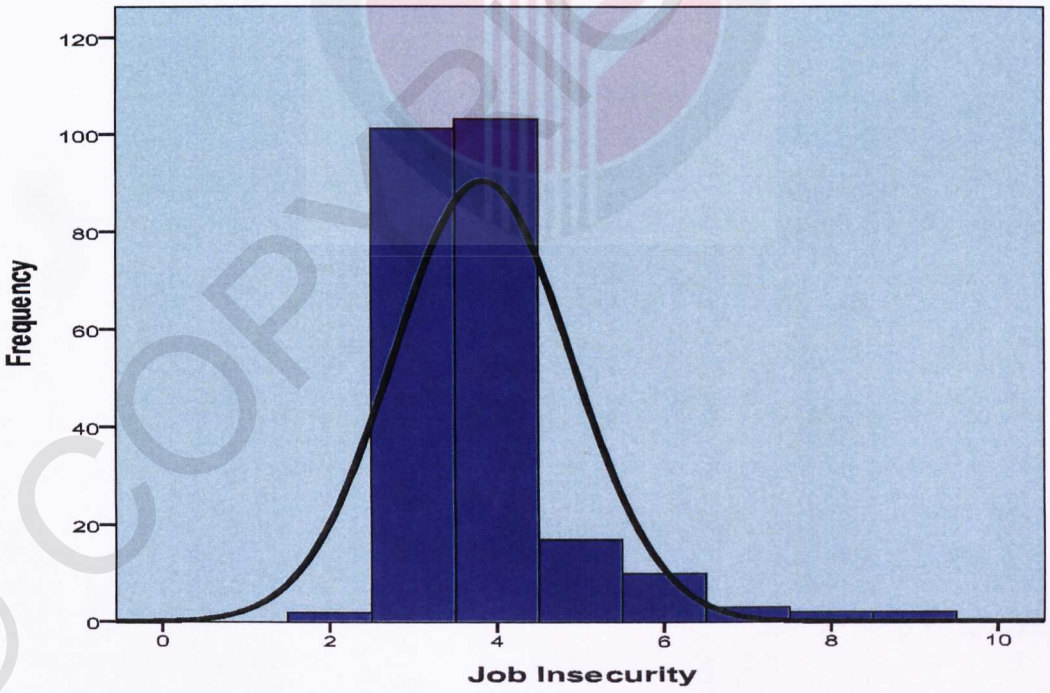


Figure 4.4: Score of job insecurity among respondents (N=240)

The scores for job insecurity among respondents are summarized in Figure 4.4. The minimum score was 2 and maximum score was 9, with a range of 7. The mean was 3.83 and standard deviation is 0.995. Respondents with scores of more than 4 (median cut off point) were considered to have low job insecurity and predicted to be less stressed.

A total of 89 of the respondents had high job insecurity (37.1%). The high level of job insecurity indicated that the respondents did not feel comfortable and did not enjoy working. The mode score of job insecurity was 4.

Table 4.2 : Distribution of organizational factors among respondents (N=240)

Organizational Factors	n (%)	Mean (SD)
Decision Latitude		49.66 (5.165)
- Low Decision Latitude	162 (67.5%)	
- High Decision Latitude	78 (32.5%)	
Psychological Job Demands		36.28 (4.212)
- Low Psychological Job Demand	85 (35.4%)	
- High Psychological Job Demand	155 (64.6%)	
Social Support		23.00 (2.181)
- Low Social Support	140 (58.3%)	
- High Social Support	100 (41.7%)	
Job Insecurity		3.83 (0.995)
- Low Job Insecurity	151 (62.9%)	
- High Job Insecurity	89 (37.1%)	

The risk factors for occupational stress were categorized by using the median scores as cut-off points. The median value of the decision latitude was 50, psychological job demand was 36, social support was 23, and job insecurity was 4. Every organizational factor was categorized into 2 categories; **low** (less than the median value) and **high** (more than the median value).

4.4 Prevalence of Occupational Stress

The second objective of this study was to determine the prevalence of occupational stress among the respondents. The identification of occupation stress was categorized according to the **psychological job demand** and **decision latitude** median values. Based on the Job Content Questionnaire (JCQ) Karasek's model, a combination of high psychological job demand and high decision latitude was defined as "**active job**", while combination of low psychological job demand and low decision latitude was defined as "**passive job**". A combination of high psychological job demand and low decision latitude was defined as "**high strain**", while combination of low psychological job demand and high decision latitude was defined as "**low strain**".

The high strain category (the combination of high psychological job demand and low decision latitude) was used to determine occupational stress in this study. Therefore, job strain can be divided into 'high strain' (occupational stress) and 'non-high strain'. Non-high strain was further divided into three sub-categories (low strain, active job and passive job). Figure 4.5 shows the percentage of high strain and

non-high strain respondents. The percentage of occupational stress (high strain) was 43.75%, which consisted of almost half of the respondents in this study.

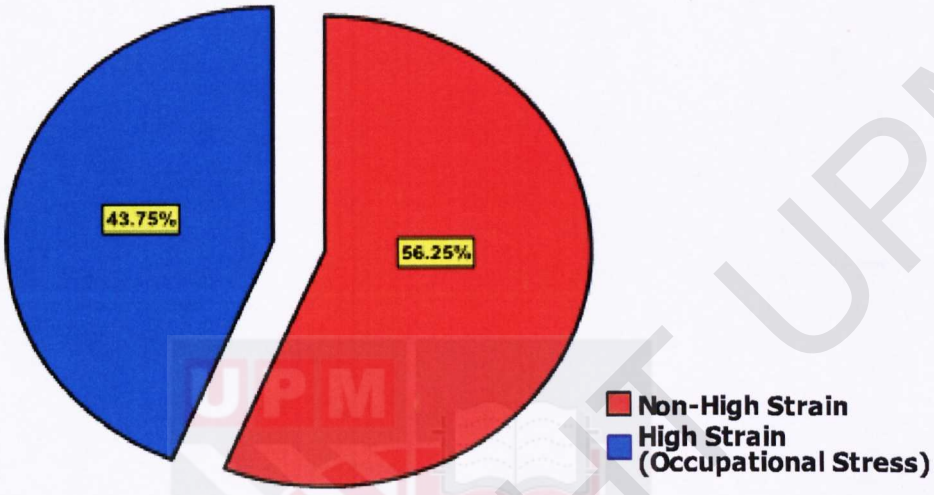


Figure 4.5: Percentage of high strain and non-high stra

Table 4.3: Distribution of Occupational Stress Level of Respondents (N=240)

Occupational Stress Level[1]	Frequency (%)
High Strain	105 (43.75%)
Non High Strain	135 (56.25%)
▪ Low Strain	36 (15.00%)
▪ Active Job	47 (19.58%)
▪ Passive Job	52 (21.67%)

[1] All variables were calculated according to the Job Content Questionnaire (JCQ) scoring formula for psychological job demand and decision latitude.

Source: Karasek, (1989)

Based on the Job Demand-Control (JDC) model of job stress, the interaction of two factors, which are psychological job demand and decision latitude, determine occupational stress. Total scores from psychological job demand and decision latitude domains determine the respondents' occupational stress.

Table 4.3 shows the occupational stress level of the respondents. Almost half of the respondents (43.75%) are categorized as high strain (occupational stress). This was followed by passive job strain (21.67%), low job strain (15.00%) and active job strain (19.58%). Hence, the findings of this study show that the majority of the respondents experience occupational stress in their jobs as crane operators.

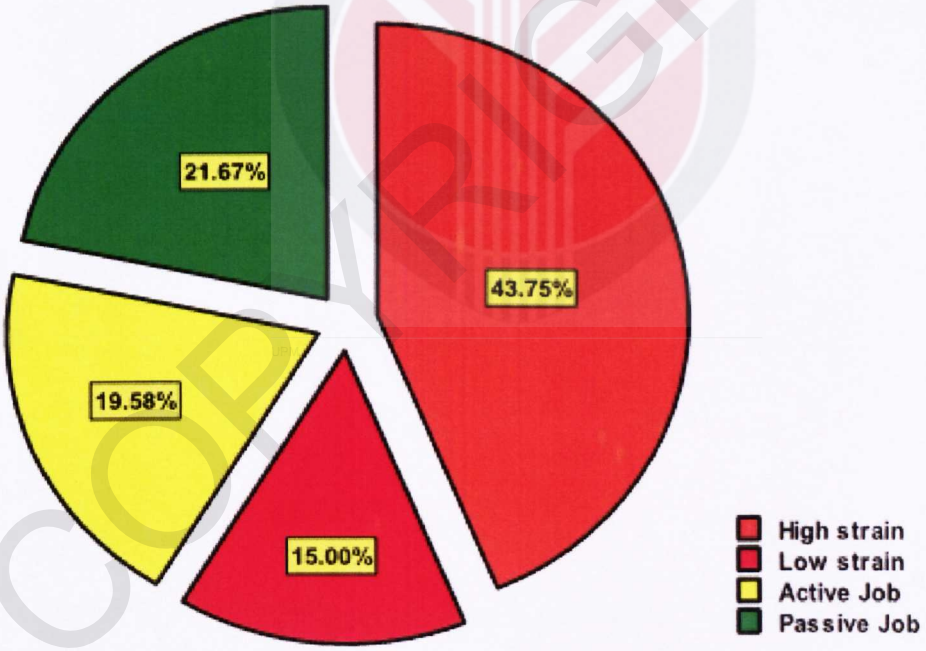


Figure 4.6 : Distribution percentage of high and non-high strain categories

4.5 Psychological Factors

Based on the DASS-21 items, the domains of depression, anxiety, and stress and their scores (in page 49) are shown as in Figures 4.7, 4.8 and 4.9.

4.5.1 Depression

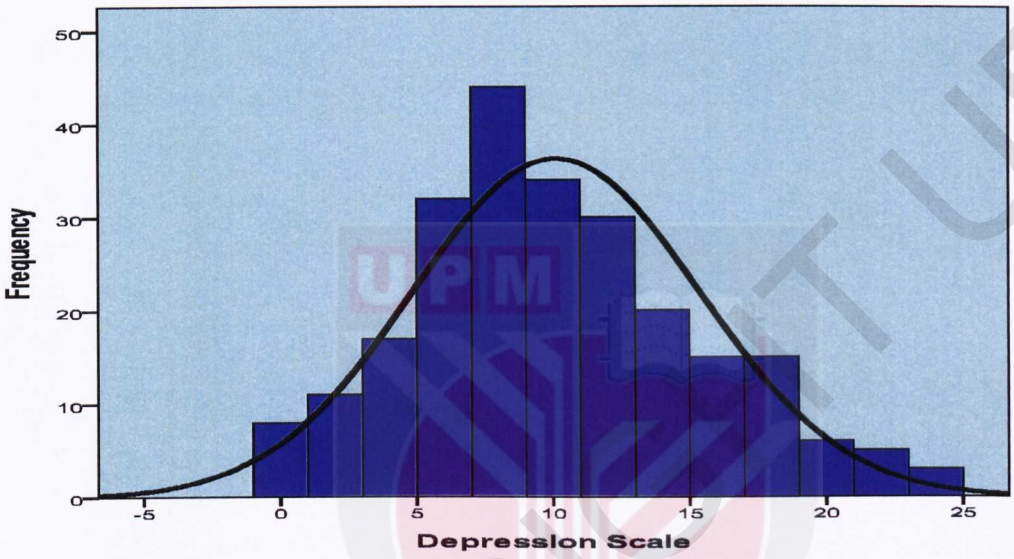


Figure 4.7: Score of depression scale among respondents

The mean score for depression was 10.11 with a standard deviation of 5.275. The ranges of score were from 0 to 24. A total of 128 (53.3%) of respondents were found to have mild to severe depression (Table 4.4).

4.5.2 Anxiety

The mean score for anxiety was 16.16 with a standard deviation of 6.324. The ranges of score were from 0 to 28. A total of 53 (22.1%) of respondents were found to have severe anxiety, as well as 91 (37.9%) were also to have extremely anxiety (Table 4.5).

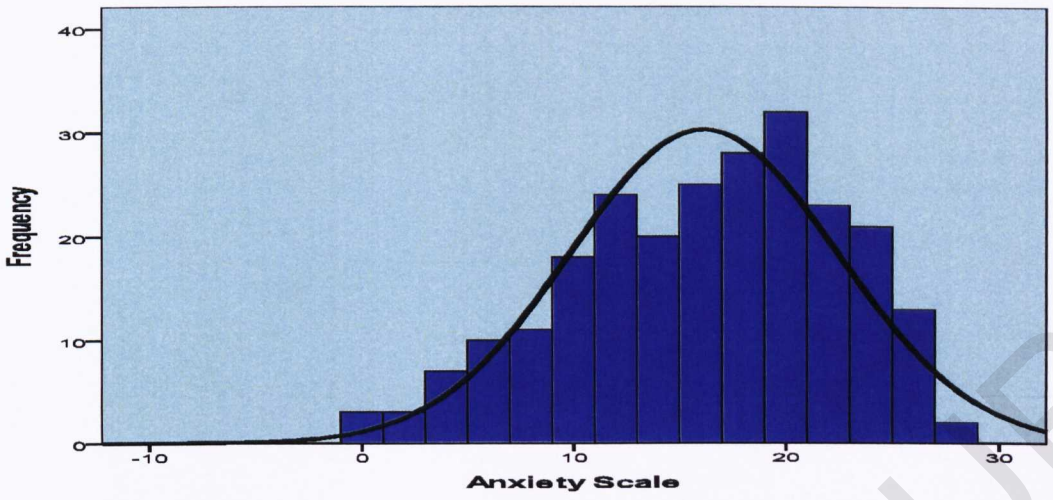


Figure 4.8: Score of anxiety scale among respondents

4.5.3 Stress

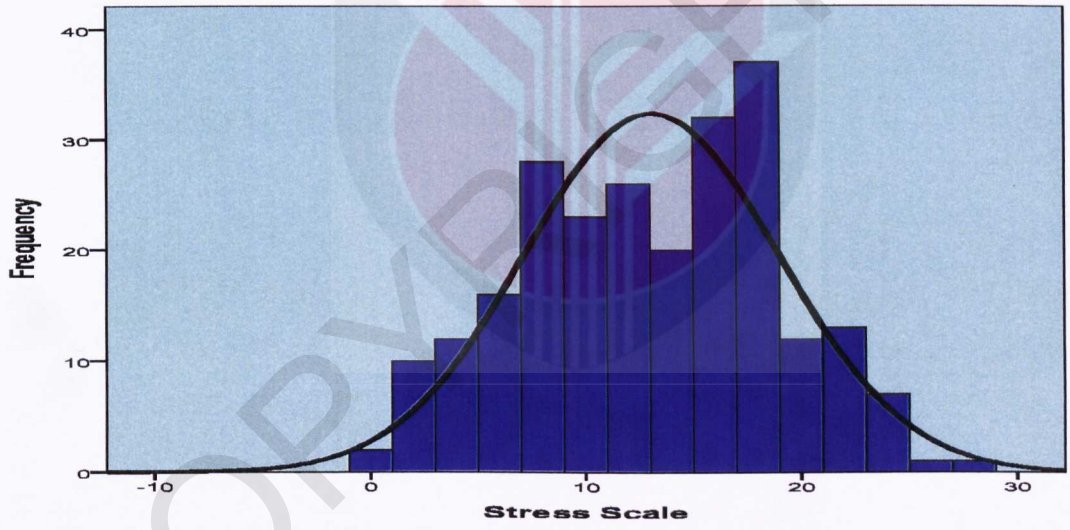


Figure 4.9: Score of stress scale among respondents

The mean score for stress was 13.07 with a standard deviation of 5.911. The ranges of score were from 0 to 28. A total of 103 (42.9%) of respondent was found to have mild to severe stress (Table 4.6).

Table 4.4: Mean and SD of Depression for DASS 21-items (N=240)

DASS Subscales	Mean	SD	Min-Max	Prevalence (%) in DASS category				
				Normal (0-9)	Mild (10-13)	Moderate (14-20)	Severe (21-27)	Extremely Severe (28+)
Depression	10.11	5.275	0-24	112 (46.7)	64(26.7)	56(23.3)	8(3.3)	0(0)

Table 4.5 : Mean and SD of Anxiety for DASS 21-items (N=240)

DASS Subscales	Mean	SD	Min-Max	Prevalence (%) in DASS category				
				Normal (0-7)	Mild (8-9)	Moderate (10-14)	Severe (15-19)	Extremely Severe (20+)
Anxiety	16.16	6.324	0-28	23(9.6)	11(4.6)	62(25.8)	53(22.1)	91(37.9)

Table 4.6 : Mean and SD of Stress for DASS 21-items (N=240)

DASS Subscales				Prevalence (%) in DASS category				
				Normal	Mild	Moderate	Severe	Extremely Severe
	Mean	SD	Min-Max	(0-14)	(15-18)	(19-25)	(26-33)	(34+)
Stress	13.07	5.911	0-28	137(57.1)	69(28.8)	32(13.3)	2(0.8)	0(0)

4.6 Relationship between Socio-Demography Factors and Occupational Stress

The third objective was to determine the relationship between occupational stress and the socio-demographic factors of the respondents (such as age, ethnicity, education background, marital status, monthly income and duration of employment). There was significant association between age and occupational stress as shown in Table 4.7 ($p<0.05$). Other than age, there was no other significant association between occupational stress and socio-demography factors ($p \geq 0.05$).

Table 4.7: Age of respondents and Occupational Stress (N=240)

	Occupational Stress					
Age	**Yes**	**No**	**Total**	**df**	**χ^2-value**	**p-value**
30-49	69 (28.75%)	105(43.75%)	174 (72.5%)	1	4.331	*0.038
50 and above	36 (15.0%)	30 (12.5%)	66 (27.5%)			
Total	135 (43.75%)	105 (56.25%)	240 (100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents aged 30-39 years old (72.5%) had a higher prevalence of occupational stress (28.75%) compared to respondents aged 50 years old and above (15.0%). This association was found to be significant ($p<0.05$).

Table 4.8 : Education Background of respondents and Occupational Stress (N=240)

Education Background	Occupational Stress			df	χ^{2}-Value	p-value
	Yes	No	Total			
Completed up to PMR (Form 1,2,3)	47 (19.58%)	58(24.17%)	105(43.75%)	1	0.078	0.780
Completed SPM/ STPM/Diploma	58 (24.17%)	77(32.08%)	135(56.25%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents who had completed SPM or STPM or Diploma had a higher prevalence of occupational stress (24.17%) compared to respondents who had completed up to PMR only (Form 1,2,3) (19.58%). This association was not found to be significant ($p>0.05$).

Table 4.9 : Marital Status of respondents and Occupational Stress (N=240)

Marital Status	Occupational Stress			df	χ^{2}-Value	p-value
	Yes	No	Total			
Single	0 (0%)	2 (0.83%)	2(0.83%)	1	1.569	0.210
Married	105 (43.75%)	133 (55.45%)	238(99.17%)			
Total	105 (43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents who were married had a higher prevalence of occupational stress (43.75%) compared to respondents who were single (0%).This association was not found to be significant (p>0.05).

Table 4.10 : Ethnicity of respondents and Occupational Stress (N=240)

Ethnicity	Occupational Stress			df	χ^2 Value	p-value
	Yes	No	Total			
Malay	95 (39.58%)	127 (52.92%)	222(92.5%)	2	2.430	0.297
Chinese	0 (0%)	1 (0.42%)	1 (0.42%)			
Indian	10 (4.17%)	7 (2.91%)	17 (7.08%)			
Total	105(43.75%)	135 (56.25%)	240 (100%)			

Chi-Square Test

*Significant at p<0.05

Respondents who were Malay had a higher prevalence of occupational stress (39.58%) compared to respondents who were Chinese (0%) as well as Indian (4.17%). This association was not found to be significant (p>0.05).

Table 4.11: Duration of Employment of respondents and Occupational Stress (N=240)

Duration of Employment	Occupational Stress			df	χ^2-Value	p-value
	Yes	No	Total			
1-10 years	76(31.67%)	104(43.33%)	180(75.0%)	1	0.683	0.409
11 years and above	29(12.08%)	31(12.92%)	60 (25.0%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with duration of employment from 1 to 10 years had a higher prevalence of occupational stress (31.67%) compared to respondents with duration of employment from 11 years and above (12.08%). This association was not found to be significant ($p>0.05$).

Table 4.12 : Monthly Income of respondents and Occupational Stress (N=240)

Monthly Income	Occupational Stress			df	χ^2-Value	p-value
	Yes	No	Total			
1260-2099	57(23.75%)	71(29.58%)	128(53.33%)	1	0.068	0.794
2100 and above	48(20.0%)	64(26.67%)	112(46.67%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondent with monthly income of respondents was RM1260 to RM2099 had a higher prevalence of occupational stress (23.75%) compared to respondents with monthly income from RM2100 and above (20.0%). This association was not found to be significant ($p>0.05$).

4.7 Relationship between Organizational Factors and Occupational Stress

The next objective was to determine the relationship between occupational stress with organizational factors among the respondents. Tables 4.13 to 4.16 below show the relationship between occupational stress and the organizational factors (decision latitude, psychological job demand, job insecurity and social support). There was significant association between decision latitude and occupational stress ($p<0.05$) as shown in Table 4.13. There was also significant association between psychological job demand and occupational stress ($p<0.05$) as shown in Table 4.14.

Table 4.13 : Decision Latitude and Occupational Stress (N=240)

Decision Latitude	Occupational Stress			df	χ^{2}-value	p-value
	Yes	No	Total			
High	18(7.5%)	69(28.75%)	87(36.25%)	1	29.490	*<0.001
Low	87(36.25%)	66(27.5%)	153(63.75%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with low decision latitude had a high prevalence of occupational stress (36.25%) compared to respondents with high decision latitude (7.5%). This association was found to be significant ($p<0.05$).

Table 4.14 : Psychological Job Demand and Occupational Stress (N=240)

Psychological Job Demand	Occupational Stress			df	χ^2-value	p-value
	Yes	No	Total			
High	70(29.17%)	44(18.33%)	114(47.5%)	1	27.498	*<0.001
Low	35(14.58%)	91(37.92%)	126(52.5%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with high psychological job demand had a high prevalence of occupational stress (29.17%) compared to respondents with low psychological job demand (14.58%). This association was found to be significant ($p<0.05$).

Table 4.15: Social Support and Occupational Stress (N=240)

Social Support	Occupational Stress			df	χ^2-Value	p-value
	Yes	No	Total			
High	39(16.25%)	57(23.75%)	144(60.0%)	1	0.635	0.426
Low	66(27.5%)	78(32.5%)	96(40.0%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with low social support had a high prevalence of occupational stress (27.5%) compared to respondents with high social support (16.25%). This association was not found to be significant (p>0.05).

Table 4.16: Job Insecurity and Occupational Stress (N=240)

Job Insecurity	Occupational Stress			df	χ^{2}-Value	p-value
	Yes	No	Total			
High	92(38.33%)	113(47.09%)	205(85.42%)	1	0.727	0.394
Low	13(5.42%)	22(9.16%)	35(14.58%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at p<0.05

Respondents with high job insecurity had a high prevalence of occupational stress (38.33%) compared to respondents with low job insecurity (5.42%). This association was not found to be significant (p>0.05).

4.8 Relationship between Psychological Factors and Occupational Stress

The next objective was to determine the relationship between occupational stress and psychological factors (depression, anxiety and stress) among the respondents. The table below shows the relationship between the factors. Only anxiety was found to be significantly associated with occupational stress (p<0.05) as shown in Table 4.18.

Table 4.17 : Depression and Occupational Stress (N=240)

Depression	Occupational Stress			df	χ^{2}-Value	p-value
	Yes	No	Total			
High	59(24.58%)	59(24.59%)	118(49.17%)	1	3.685	0.055
Low	46(19.17%)	76(31.66%)	122(50.83%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at p<0.05

Respondents who were found to have depression from the DASS-21 questionnaire had a higher prevalence of occupational stress (24.58%) compared to the respondents without depression (19.17%). However, this association was not significant (p>0.05).

Table 4.18 : Anxiety and Occupational Stress (N=240)

Anxiety	Occupational Stress			df	χ^{2}-Value	p-value
	Yes	No	Total			
High	98(40.83%)	119(49.59%)	217(90.42%)	1	7.659	*0.006
Low	7(2.92%)	16(6.66%)	23(9.58%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at p<0.05

Respondents with anxiety had a higher prevalence of occupational stress (40.83%) compared to respondents without anxiety (2.92%). There was significant association between anxiety and occupational stress in this study (p<0.05).

Table 4.19 : Stress and Occupational Stress (N=240)

Stress	Occupational Stress			df	χ^2 Value	p-value
	Yes	No	Total			
High	77(32.08%)	90(37.5%)	167(69.58%)	1	1.240	0.265
Low	28(11.67%)	45(18.75%)	73(30.42%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents who were found stress from the DASS-21 questionnaire had a higher prevalence of occupational stress (32.08%) compared to the respondents who without stress (11.67%). However, this association was not significant ($p>0.05$).

4.9 Relationship between Specific Job Factors and Occupational Stress

Table 4.20, 4.21 and 4.22 show the relationship between specific job factors and occupational stress. There was significant association between occupational stress with toxic exposure, physical isometric load and muscle ache ($p<0.05$) in this study.

Table 4.20 : Toxic Exposure and Occupational Stress (N=240)

Toxic Exposure	Occupational Stress			df	χ^{2} Value	p-value
	Yes	No	Total			
High	65(27.08%)	63(26.25%)	128(53.33%)	1	5.510	*0.019
Low	40(16.67%)	72(30.0%)	112(46.67%)			
Total	105(43.75%)	135(56.3%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with high toxic exposure had a higher prevalence of occupational stress (27.08%) compared to respondents without toxic exposure (16.67%). There was significant association between toxic exposure and occupational stress in this study ($p<0.05$).

Table 4.21 : Physical Isometric Loads and Occupational Stress (N=240)

Physical Isometric Loads	Occupational Stress			df	χ^{2} Value	p-value
	Yes	No	Total			
High	74(30.83%)	77(32.08%)	151(62.92%)	1	4.572	*0.032
Low	31(12.92%)	58(24.16%)	89(37.08%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with high physical isometric loads had a higher prevalence of occupational stress (30.83%) compared to respondents with low physical isometric loads (12.92%). There was significant association between physical isometric load and occupational stress in this study ($p<0.05$).

Table 4.22 : Muscle Ache and Occupational Stress (N=240)

	Occupational Stress					
Muscle Ache	**Yes**	**No**	**Total**	**df**	**χ^{2}-Value**	**p-value**
High	57(23.75%)	55(22.92%)	112(46.67%)	1	4.354	*0.037
Low	48(20.0%)	80(33.33%)	128(53.33%)			
Total	105(43.75%)	135(56.25%)	240(100%)			

Chi-Square Test

*Significant at $p<0.05$

Respondents with high muscle ache had a higher prevalence of occupational stress (23.75%) compared to respondents having low muscle ache (20.0%). There was significant association between muscle ache and occupational stress in this study ($p<0.05$).

4.10 Predictor factors of occupational stress among the respondents

Table 4.23: Factors that contribute to Occupational Stress (N=240)

Variables	Odd Ratio	Std. Error	B	Wald	p-value	95% CI (Lower; Upper)
Constant	0.107	0.606	-2.236	13.616	*<0.001	
Psychological Job Demands	4.137	0.309	1.420	21.134	*<0.001	2.258; 7.579
Decision Latitude	0.248	0.341	-1.396	16.710	*<0.001	0.127; 0.484
Anxiety	2.314	0.317	0.839	6.990	*0.008	1.242; 4.311
Physical Isometric Load	1.902	0.306	0.643	4.413	*0.036	1.044; 3.463
Muscle Ache	1.761	0.343	0.566	2.721	*0.041	0.899; 3.449
Toxic Exposure	1.612	0.371	0.471	1.612	0.204	0.774; 3.316
Age	1.205	0.310	0.186	0.362	0.548	0.656; 2.213

0= No , 1= Yes

*significant at $p<0.05$

Note : R^2= 0.260_ (Cox & Snell), 0.335 (Nagelkerke's)

Model χ^2(Omnibus test) = 69.045, p = *<0.001

Hosmer and Lemeshow Test = 3.953, p = 0.861

Based on the multiple logistic regression analysis, the following variables were found to be predictor factors for occupational stress in this study. These predictor factors were psychological job demands, decision latitude, physical isometric load and muscle ache as well as anxiety ($p<0.05$). Occupational stress was strongly associated with organizational factors (psychological job demands and decision latitude) and specific job factors (physical isometric load and muscle ache) among crane operators. The Nagelkerke's R^2 value for this model was 0.335, which meant that 33.5% of variation in occupational stress was demonstrated by this model. Based on the Omnibus test of model coefficients, the χ^2 = 69.045, $p <0.001$ meant that the predictor model fitted the data.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Prevalence of Occupational Stress

The general objective of this study was to determine the prevalence of occupational stress among crane operators. Psychological job demands and decision latitude obtained from the Job Content Questionnaires (JCQ) was used to determine the prevalence of occupational stress.

The prevalence of occupational stress among crane operators in this study was 43.75%. The result is slightly higher compared to other studies using similar methods conducted among dental workers (22.2%), petrol tanker drivers (25%), laboratory technicians (33.3%) and nurses (25.8%) (Sunmin, 2002, Rusli and Huda 2004, Nadia 2008). High psychological job demands might be related to increasing job demand and task interrupted, was complained by majority of the respondents.

Meanwhile, low decision latitude might be influenced by little freedom on decision-making. An occupational study demonstrated that high levels role conflict, low job control, and low safety-specific leadership are associated with increased worker strain (Erin *et al.*, 2011).

According to the dominant Job Demands–Control (JD-C) model developed by Karasek and Theorell (1990), job strain is expected to result from high job demands and low job control, as well as the interaction between both job characteristics. This model has consistently found that these two factors are main predictors for occupational stress.

This should found that 56.25% of respondents did not have occupational stress. These respondents categorized under the non-high strain category. This could have been due to the fact that 21.6% of this group belonged to the passive job group, which is the lowest strain group among all the other groups in the non-high strain categories. The passive group is determined from the combination of low psychological job demands and low decision latitude.

5.2 Relationship between socio-demographic factors and occupational stress

Among all the socio-demographic factors studied, only age had a significant relationship with occupational stress. The other socio-demographic variables such ethnicity, marital status, education background, monthly income and duration of employment did not have significant association with occupational stress.

The findings of this study correspond to other studies on occupational stress, which found that individual-related stressors like demographic characteristics are associated with occupational stress (Nina, 2007). Demographic variables that have been proven to relate with worker's job stressor or health relationships include age and job possession (Murphy, 1995). Other findings showed no significant difference in occupational stress between single and married workers (Hossein *et al.*, 2011). Another study also stated that age is one of the factors that contribute to occupational stress (Murphy, 1995).

A study by Sharpley et al found that workers between the ages of 31 and 40 years old suffered the most from occupational stress. This was because the older workers reached a stage where career development was not their major concern compared to the middle age group (Sharpley *et al.*, 1996). In contrast, workers whose age groups are between 35–49 years tend to experience cumulative job stress while working long periods and this contributed to poor mental health (Isabelle *et al.*, 2005).

Another study stated that the relationship between age with occupational stress can be explained by life experience and professional growth. It is possible that older workers have been in their occupation for a longer period, life experiences may have resolved internal issues relating to their self-efficacy and suitability to work (John *et al.*, 2007).

Statistics have indicated that the highest estimated prevalence rates of self-reported work-related stress, depression, and anxiety were among the age groups 35-44 and 45-54 (HSE, 2003).

5.3 Relationship between organizational factors and occupational stress

Four main organizational factors domains (decision latitude, psychological job demands, social support and job insecurity) were studied for association with occupational stress in this study. It was found that there was significant association between occupational stress and decision latitude ($p<0.001$) and psychological job demands ($p<0.001$). There was no significant association between occupational stress with social support and job insecurity ($p>0.05$).

5.3.1 Decision Latitude and Occupational Stress

Low decision latitude and high workload at workplace settings can cause the workers to develop chronic stress and health problems (Karasek, 1990). The demand-control model hypothesized that jobs characterized by high quantitative demands in combination with low decision latitude adversely affect health (Isabelle *et al.,* 2005).

Following Karasek-Theorell Job Strain Model, decision latitude gave a huge effect to occupational stress of the workers if the level of occupational stress was higher and decision latitude was lower. Increase latitude in decision-making improves general health (Niedhammer *et al.*, 2008). Janssen and Nijhuis (2004)

reported positive changes in high latitude of decision-making to be associated with a decrease in emotional exhaustion in professionals working with the disabled.

An example of low decision latitude in a work environment is when workers find their work environment not flexible and they must obey every single instruction from the top management. In this situation, they cannot make self-decisions or determine their own actions regarding their job tasks. For example among crane operators, in any conditions (including bad weather), they are expected to continue their jobs because the container vessels cannot be ashore for long periods. Therefore, the crane operators have followed the schedule that was organized by the operation department carefully to avoid any delays.

5.3.2 Psychological Job Demands and Occupational Stress

This study found that there was significant association between occupational stress and psychological job demands. It meant that workers experienced high psychological job demands were at greater rise to have occupational stress.

As crane operators, the workers are required to achieve the daily target in container handling activities. The crane operators must protect every single container that they are handling; including full container load (FCL), less container load (LCL), empty container (MT) and transshipment container. The crane operators have

to lift up the containers securely and land the containers safely. As a result, the psychological job demands are high (Penang Port, 2011).

The experience of distress is associated with a wide range of physical, psychological and behavioral disturbance. The findings of this study are similar to other studies, which found that when psychological job demands are high, the workers experience occupational stress. When conflict arises with demands and pressures during working hours, it acts as a contributor to occupational stress (Leka, 2004). Commonly, self-reported high psychological demands and low decision latitude were significantly associated with increased depression symptom (Kolstad *et al.*, 2010).

It has been stated that when there are more psychological job demands on workers, the more occupational stress there workers will experience. Work overload is also often reported as a contributor of occupational stress (Stuart *et al.*, 2008) and is a frequently mentioned reason for job turnovers (Chang *et al.*,2005).

In this study, the psychological job demands on the crane operators vary. They have to avoid many risks at work such as wrong delivery in decks, untimely transfers and damage cargoes. Apart from shortage of workers, crane operators have many responsibilities at work, which contribute to their psychological job demands.

A study showed that crane operators should always be aware of their surroundings to make sure that they are in good condition. There an accident where a crane operator was fell while performing his job which was task-handling a container at the Southampton Container Terminal, United Kingdom. The consequence was that all shipside operations were suspended immediately as a precaution (Kennedy,2008).

5.4 Relationship between psychological factors and occupational stress

Psychological factors are contributing factors that induce workers to experience occupational stress. There was significant association between occupational stress and anxiety in this study.

A study by Marchand (2007) stated that mental health problems in the workforce remain a major issue today. Following a longitudinal study, Kyriacou (2001) found that susceptibility to develop anxiety among workers is approximately equal to the rate of reported occupational stress. Occupational stress has a strong relationship with negative feelings such as frustration, worry and anxiety, which are perceived to arise from the workplace.

Previously another study stated that susceptibility to anxiety and specific work factors such supervising, driving and skilled machine work were also related to the rate of reported strain (Nicola, 1978). A survey in the United Kingdom provided an estimate of 13.4 million working days lost in Britain in 2001 due to stress, depression, or anxiety (Benneth *et al.,* 2004).

5.5 Relationship between specific job factors and occupational stress

5.5.1 Toxic Exposures with Occupational Stress

The findings of this study showed that there was significant association between occupational stress with toxic exposure. Although, the crane operators were not handling any toxic chemicals directly they were exposed to the smoke from the vessels at the container terminal throughout their work daily.

Air pollution emitted from the vessels consists of many pollutants. The smoke comes from the diesel combustion and exhaust emission from vessels are considered a significant source of air pollution, with 18 to 30 percent of nitrogen oxide and 9 percent of sulphur oxide pollution (Vidal, 2009). The main product of vessel combustion is diesel, which contains benzene.

The impact of dirty smoke from vessels burning high-sulfur fuel can be considerable and sulfur-rich particulate matters in the air are known to be hazardous to human health. The particles get into the lungs and are small enough to pass through tissues and enter the blood. They can then trigger inflammations which eventually cause heart and lung failures. Ship emissions may also contain carcinogenic particles (Secretariat, 2010). It has been reported that occupational stress is associated with the toxic exposure due to vessel smoke (David *et al.*, 2000).

5.5.2 Physical Isometric Loads with Occupational Stress

There was significant association between occupational stress with physical isometric loads among the respondents in this study. Physical isometric loads include work-related musculoskeletal disorders, which constitute a major problem in many industrialized countries. For example repetitive work, working extreme and static postures and working using forceful arm and hand movements have been found to be associated with upper extremities' disorders (Punnett *et al.*, 2000).

Based on a study by Eklund *et al.,* (1994), posture and awkward positioning risk factors were recognized in a study on forklift trucks and crane operators. Following the New Zealand injury data survey (2008) it was indicated that crane operators had high rates of reported pain in their arms, necks, shoulders and lower backs (Edwin *et al.*, 2009). In the United Kingdom, approximately 1000 crane operators reported an increasing number of musculoskeletal problems (Shaw, 1999).

Generally, psychosocial conditions have commonly been found to be associated with musculoskeletal disorders (Linton, 2000). When the workers work in incorrect postures, it will cause strain on soft tissues or muscle spasm. Musculoskeletal disorders of the arm, neck, shoulder and lower back appear to be a common experience for crane operators (Edwin *et l.*, 2009).

A study on musculoskeletal symptoms among workers found that workers who perceived their psychological workload as high and their decision latitude as low, reported more neck, shoulder and low back symptoms than persons who reported low psychological workload and high decision latitude (Johansson, 1995).

Psychosocial factors at work, which have been shown to play important roles in the development of musculoskeletal pain included work demands and decision latitude, symptoms of stress and social support (Chen,2005). Bongers *et al.,* (1993) study concluded that monotonous work, high-perceived workload, time pressure, low control on the job, lack of social support from co-workers and stress symptoms were related to musculoskeletal problems.

5.5.3 Muscle Ache with Occupational Stress

There was also significant association between occupational stress with muscle ache among the respondents in this study. This was expected as crane operators are subjected to prolonged sitting everyday up to 4 hours without any breaks while performing their job tasks. As discussed above, muscle ache could be the outcome of the musculoskeletal problems (physical isometric loads) experienced by the crane operators, which was also significantly associated with occupational stress in this study.

5.6 Study Strength and Limitation

5.6.1 Study Strength

This is the first study on occupational stress to be conducted among crane operators at a container terminal port in Malaysia. The findings of this study can be used as baseline data for future larger studies among this population in Malaysia.

Another strength of this study is the use of validated questionnaires that are based on a well-defined and widely tested theoretical psychosocial stress model (Karasek & Theorell, 1990). The Bahasa Malaysia versions of the Job Content Questionnaires (JCQ) and the Depression, Anxiety and Stress Scale (DASS-21 item) which were used in this study were well validated and published in our local population. These questionnaires were obtained directly with permission from their relevant authors (copyright holders), who also provided valuable guidance in using and scoring the questionnaires.

A pilot test was done to establish the feasibility of the study. To improve accuracy of the data, the researcher was present at all times throughout the data collection process. This established a good relationship between the researcher and the respondents, as well as the management, and is proven by the excellent response rate of 100%. It also enabled the respondents to clarify some queries and answer the questionnaires with sincerity and honesty.

5.6.2 Study Limitation

There are several limitations in this study:

i. This study was conducted only at one container terminal port in Penang. Therefore, it does not represent all crane operators in other container terminal ports in Malaysia.

ii. The sample size of this study was small and thus, it may have reduced the power of this study to detect a significant outcome.

iii. The outcome of this study was measured by the answers of respondents from the self-administered questionnaires. Therefore, the results of this study are based entirely on the respondent's honesty and how they perceived their attitudes towards the variables used in this study.

5.7 Conclusion

This study was a preliminary study which contributed baseline data on the prevalence of occupational stress among container terminal's crane operators at a container terminal port. From the findings of this study, it was concluded that crane operators have a high prevalence of occupational stress (43.75%). Occupational stress was significant among crane operators between ages of 30 to 49 years old, who suffered from low decision latitude, high psychological job demands, anxiety, toxic exposure, physical isometric loads and muscle ache.

Result obtained from statistical analyses that were used to test the hypotheses in the study proved that:

i) There is a high prevalence of occupational stress among the respondents.

ii) There is a relationship between socio-demographic factors (age) and occupational stress among the respondents.

iii) There is a relationship between organizational factors (decision latitude and psychological demand) and occupational stress among the respondents.

iv) There is a significant relationship between psychological factors (anxiety) and occupational stress among the respondents.

v) There is a significant relationship between specific job factors (toxic exposure, physical isometric load and muscle ache) and occupational stress among the respondents.

5.8 Recommendation

Concerns about occupational stress has been increasing among workers. Over the years, many types of mitigation (correction) strategies have been implemented to solve occupational stress problems.

Based on this study's findings, occupational stress among crane operators can be reduced by increasing decision latitude and reducing psychological job demands, anxiety, toxic exposure, physical isometric load as well as muscle ache. Mitigation of occupational stress problems should be divided into two categories, which including the organizational and the workers (in individual):

(1) Organization Level

i. Top management responsibilities

The findings of this study will be presented to the top management so that they can tackle the initiative in solving these occupational stress problems. The recommendations made to the managements based on this study's findings are :

- The management should determine the source of the occupational stress. Decisions need to be made about what practical solutions will be used in the workplace to prevent, eliminate or minimize the effect of occupational stressors on the workers. The decisions should include comments from the crane operators themselves.

- The management should cooperate with the operations department; to assess the problems that the crane operators are facing while working. These may include long working hours repetitive job tasks. The management should re-arrange the working schedules of the crane operators to optimize their exposure time. The operations department could also shorten the working hours.
- The management should cooperate with the safety and health unit; in doing risk assessments for crane operators. This process can aid in controlling exposure to health and safety risks associated with occupational stress at the container terminal port.
- Vacuum cleaners should be used for removal of dust in to reduce accumulated toxic exposure to crane operators. The management should also addressed other hygiene issues, such as to clean up of the cabin's window to improve the visibility of the crane operators while performing their jobs.
- The management should Appoint representatives among the crane operators and do regular meetings to discuss any problems among them. Using participatory approach, the crane operators can clarify their problems and provide ideas for changes in the work environment. It can generate awareness and sensitivity on the issues of stress at the workplace.

ii. Stress management programme

- Health educations programme should be carried out to educate the crane operators about occupational stress and the way to cope with it. An example is a health-screening programme; which consists of short talk about current occupational stress scenarios and how to manage stress. This can also include video sessions, question and answer sessions, and pamphlet distribution to the crane operators. Appropriate physical exercises can also be taught to the crane operators so that they can reduce their musculoskeletal problems associated with their job.

iii. Occupational health doctors

- Medical appointments should be arranged, where the crane operators must visit the occupational health doctor to confirm that they are well and fit. Registered occupational health doctors can do health assessments and check-ups, as well as provide the necessary advice to the crane operators. This can help to maintain the well-being of the crane operators.

(2) Individual Level

i. Staff training

- The crane operators can be given ergonomics training related to musculoskeletal disorders and muscle aches. They should be educated on the proper postures required while performing their jobs and how to avoid muscle aches and musculoskeletal disorders by practicing these postures.

ii. Regularly exercise

- Crane operators can take short breaks to minimize the ergonomics hazard. The practices can include eye exercises (blinking their eyes for 30 seconds to allow the muscles inside the eye to relax).
- 2 minutes break to stretch their muscle and rest-breaks (which takes about 10 minutes to stand up and do simple exercise to relieve the muscle fatigue).

REFERENCES

ASEAN Ports Association Malaysia (MAPA). (n.d.). Related News. http://www.apamalaysia.com/cateogory/related-news/

Alberta Health Services. (2010). Addiction and Mental Health. *Workplace addiction and mental health in the construction industry: Literature synthesis*. Edmonton, Alberta, Canada: Author.

Aziah BD, Rusli BN, Winn T, Naing L and Tengku MA (2004). Prevalence and risk factors of job strain among laboratory technicians in Hospital Universiti Sains Malaysia. *Singapore Medical Journal*. 45:170-175.

Azlihanis Azlihanis AH, Aziah D, Rusli BN (2006). The reliability and validity of the Bahasa Malaysia version of the JCQ has also been tested in secondary school teachers in Kota Bharu, Kelantan. *Southeast Asian Journal Tropical Medicine Public Health.* 37(6): 1254-1259.

Bennett P, Williams.Y., Page. N., Hood. K., Woollard. M., (2004) Levels of mental health problems among UK emergency ambulance workers. *Emergency Medical Journal.* 21(2): 235-236.

Berita Harian, (2010). Mutakhir. Tekanan sebabkan kemalangan ditempat kerja: http://www.bharian.com.my/articles/Tekanan sebabkan kemalangan ditempat kerja/Article/

Bernama. (2005). Achieved. Depression to Become Second Major Cause of Death in Malaysia.http://www.bernama.com/bernama/v5/searchindex.php?terms

BLS (2003). Survey of occupational injuries and illnesses. Nonfatal (OSHA recordable) injuries and illnesses. Case and demographic characteristics. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, Safety and Health Statistics Program. www.bls.gov/iif/oshcdnew.htm

Bonger PM, Winter CRV, Kompier MAJ, (1993). Psychosocial factors at work and musculoskeletal disease. *Scand J Work Environ Health*.19: 297–312.

Broeck Jan Van den, Roger Eeckels, Kobus Herbst (2005) Data cleaning detecting, diagnosing, and editting data abnormalities. PLoS Medicine. 2:966-970.

Brown TA, Chorpita.B. F., Korotitsch, W., & Barlow, D. H.(1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research Therapy* 35:79-89.

Bryce, C. (2001). Insight into the Concept of Stress. *World Health Organization: Emergency Preparedness and Disaster Relief Coordination Program.* Washington, DC.

Carayon P, Smith MJ, Haims MC. (1999). Work organization, job stress, and work-related musculoskeletal disorders. *Hum Fact.* 4: 644–66

Chang, E. M., Hancock, K. M., Johnson, A., Daly, J., & Jackson, D. (2005). Role stress in nurses: Review of related factors and strategies for moving forward. *Nursing and Health Sciences.* 7: 57–65.

Chartered Institute of Building, (2006). Occupational Stress in the Construction Industry.Berkshire: CIOB.

Chen W Q, I T-S Yu, T W Wong. (2005). Impact of occupational stress and other psychosocial factors on musculoskeletal pain among Chinese offshore oil installation workers. *Occupational Environment Medicine.* 62: 251–256.

Cooper, C. L., Liukkonen, P., & Cartwright, S.(1996). Stress Prevention in the Workplace. European Foundation for the Improvement of Living and Working Conditions. Dublin, Ireland. Lanham, MD: UNIPUB.

David C Christiania, Xiping Xua. (2000) Exposure to benzene and occupational stress. *Occupational Environment Medical* 57:661-667.

Davey, J., Obst, P., & Sheehan, M. (2001). Demographic and workplace characteristics which add to the prediction of stress and job satisfaction within the police workplace. *Journal of Police and Criminal Psychology, 16*(1), 29-39.

Department of Statistics Malaysia 2008, IPWebteam, Department of Statistics Malaysia, viewed: 10 October 2011, http://www.statistics.gov.my/english/framedset_keystats.php?fid=k

Drewry, D.A. (2001). The NOHSC Symposium on OHS Implications of Stress at Work in the New Zealand perspective. National Occupational Health and Safety Commission. New Zealand.

DynaMed. (2011). Definition of Low back strain.

Drake, R. E., Becker, D. R., Goldman, H. H., & Martinez, R. A. (2006). Best practices: The Johnson & Johnson. Dartmouth Community Mental Health Program: Disseminating evidence-based practice. *Psychiatric Services.* 57: 302-304.

Edimansyah BA, Rusli BN, L Naing and M Mazalisah (2006) Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ). *Southeast Asian Journal Tropical Medical Public Health.* 37(2): 412.

Edimansyah BA, Rusli BN, Naing L, Mazalisah BM (2008) Self-perceived Depression, Anxiety, Stress and Their Relationships with Psychosocial Job Factors in Male Automotive Assembly Workers. *Industrial Health Journal.* 46: 90–100.

Edwin M., & Alexander, S.,(2008). Musculoskeletal discomfort in crane and forklift operators in a New Zealand port. Port Nelson health and safety advisor. New Zealand.

Eklund, J., Odenrick, P., Zettergren, S, and Johansson, H. (1994). Head posture measurements among work vehicle drivers and implications for work and workplace design. *Ergonomics Journal.* 37(4): 623-639.

EPA. (2003) US Environmental Protection Agency Control of Emissions From New Marine Compression-Ignition Engines at or Above 30 Liters Per Cylinder Federal Register. Washington, DC.

Erin M. Eatougha, Jason D. Waya, Chu-Hsiang Changb. (2011) Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints. *Applied Ergonomics.*

Fevre, M.L., Matheny, J., & Kolt, G. S. (2003). Eustress, distress and interpretation in occupational stress. *Journal of Managerial Psychology.* 18 (7): 726-744.

Harrabin, R (2003). EU faces ship clean-up call. *BBC News.* http://news.bbc.co.uk/2/hi/europe/3019686.stm

Henry JD, Crawford. JR. (2005) The short-form version of the Depression Anxiety Stress Scales (DASS-21). Construct validity and normative data in a large non-clinical sample. *British Journal Clinical Psychology.* 44: 227-39.

Highfield, Roger. (2008).Shipping pollution may cause 60000 deaths a year. The Telegraph Science News. 18 August 2008. http://www.telegraph.co.uk/science/science-news/3349831/Shipping-pollution-may-cause-60000-deaths-a-year.html

Hossein P.Z, Mozhdeh. G.S. (2011). To Determine the Relationship between Occupational Stress and Mental Health Status of the Employees in Sport Sciences Research Center Iranian. *Journal of Health and Physical Activity.* 2 (2): 71-76.

Health and Safety Executive,HSE (2004). Psychosocial working conditions in Great Britain in 2004. Sudbury, England: Author.

Health and Safety Executive,HSE (2009). Psychosocial Working Conditions in Britain in 2009. Sudbury, England: Author.

Isabelle Godin, France Kittel, Yves Coppieters and Johannes Siegrist. (2005). A prospective study of cumulative job stress in relation to mental health. *BioMed Central Public Health*. 5:67.

Ishak, HO. (2002). National report of malaysia on the bay of bengal large marine ecosystem programme. United Nations environment programme East Asian regional coordinating unit. Malaysia.

Janssen, N., & Nijhuis, F. J. N. (2004). Associations between positive changes in perceived work characteristics and changes in fatigue. Journal of Occupational and Environmental Medicine, 46, 866–875.

Jarvis, M. (2002). Teacher stress: A critical review of recent findings and suggestions for future research directions. Teacher Support Network, 14(1). Retrieved Sept.1, 2011, fromhttp//www.teachersupport.org.uk/index.

Joanna ES, Michael SK. (2002). The psychometric properties of Karasek's demand and control scales within a single sector: data from a large teaching hospital. *International Archives of Occupational and Environmental Health*. 75: 145

Johansson, J.A. (1995). The impact of decision latitude, psychological load, and social support at work on musculoskeletal symptoms. *European Journal of Public Health*. 5: 169–174.

John Burke Sullivan, Gary R. Krieger. (2001). Clinical environmental health and toxic exposures. Lippincott Williams & Wilkins. 2nd Edition. USA.

John J. De Nobile, John McCormick. (2007). Occupational Stress of Catholic Primary School Staff: Investigating Biographical Differences. Annual Conference of the Australian Association, Fremantle. 25-29.

Jumlong V, Boonchom Sa, Saner P, Nipaporn S. (2011). Development of Iterated Weighted Jacknife Method and Regression (IWJR) for Estimating Missing Data. *European Journal of Social Sciences*. 25:1

Karasek, R. A. (1979) Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*. 24: 285–309.

Karasek R. (1985). *Job Content Questionnaire and User's Guide.* Los Angeles , University of Southern California, Department of Industrial Engineering and Operation Research.

Karasek, R., Theorell, J., (1990). *Healthy Work: Stress. Productivity and the Reconstruction of Working Life.* Basic Books, New York.

Karasek R, Brisson C, Kawakami N, Houtman I, Bongers P, Amick B (1998). The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *Journal Occupational Health Psychology.* 3(4):322-355.

Karasek, Robert. (2005). The Stress-Disequilibrium Theory of Chronic Disease Development: Low Social Control and Physiological Deregulation. University of Massachusetts Lowell, USA.

Kennedy, Clare. (2008). Crane carrier broke loose of its moorings. Languard, Felixstow, United Kingdom.

Kennedy, Clare. (2008). Man trapped after crane collapses in Southampton Docks. Southampton, United Kingdom.

Kenneth Brynien, A. I. (2006). Occupational Stress Fact Sheets. PEF Health and Safety Department. New York State Public Employees Federation. Retrieved from :
http://pef.org/healthandsafety/files/occupationalstress

Kirkwood BR, Sterne. JAC (2003) Essential medical statistics, 2nd edition. Oxford. Blackwell Scientific MMA.

Kolstad, H. A., Marie, H., Jane, F. T., Linda, K., Sigurd, J. M., (2010). Job Strain and the Risk of Depression: Is Reporting Biased? *American Journal of Epidemiology*. 173:94–102.

Kyriacou, C. (2001). Teacher Stress: Directions for Future Research. *Educational Review.* 53 (1): 27-35.

Lazarus, R. & Folkman, S. (1997). Stress, Appraisal, and Coping. New York. Springer Publishing. pp:456

Leka S. (2003), Work Oeganization and Stress, Protection Workers, Health Series no 3, *World Health Organization*, 2(8): 41-46. http//www.who.int/ occupational _health

Leka, S., Griffiths, A. & Cox, T. (2004). *Work organization & stress*. Systematic problem approaches for employers, managers, and trade union representatives. Retrieved on 5 August 2011 from http://www.who.int/ occupational_health/publications/pwh3rev.pdf

Linton, S.J., (2000). A review of psychological risk factors in back and neck pain. Spine 25(9): 1148–1156.

Lohr, V.I., C.H. Pearson-Mims, and G.K. Goodwin. (1996). Interior plants may improve worker productivity and reduce stress in a windowless environment. *Journal Environment Horticulture*. 14:97–100.

Lovibond PF, Lovibond SH.(1995). Manual for the Depression Anxiety Stress Scales. School of Psychology, University of New South Wales. Sydney.

Lu, L., Cooper, C. L., Kao, S.-F., Zhou, Y. (2003). Work stress, control beliefs and well-being in Greater China, an exploration of sub-cultural differences between the PRC and Taiwan. *Journal of Managerial Psychology*. 18(6): 479-510.

Ma, K. H., Yam, K. L., Tsui, K. W., & Yau, F. T. (2006). Internal Consistency and Test-Retest Reliability of the Chinese Version of The Self-Report Health-Related Quality of Life Measure for Children and Adolescents With Epilepsy. *Epilepsy &Behavior. 9*(1): 51-57.

Marchand A. (2007). Mental health in Canada: Are there any risky occupations and industries? *International Journal of Law and Psychiatry*. 30:272–283.

Marcus SC, Pincus HA Elinson L, Houck P. (2004). Depression and the ability to work. *Psychiatry Services*. 55:29–34.

Maxon Rebecca, (1999). Stress in the Workplace: A Costly Epidemic. Fairleigh Dickinson. Retrieved from : University http://www.fdu.edu/newspubs/ magazine/ 99su/stress.html.

McGowan, J., Gardner, (2006). Positive and Negative Affective Outcomes of Occupational Stress. New Zealand. *Journal of Psychology*. 35(2).

Michie S. (2002) Causes and management of stress at work. International Labor Organization. *Occupational Environmental Medical*. 59: 67- 72.

Mosby's Medical Dictionary. (2009). Definition of low back pain. 8th edition. Elsevier.

Murphy, L. R., (1995) Occupational Stress Management: Current Status and Future Direction. In Trends in Organizational Behavior. 2:1-14

Murphy, L. R. (1995). Managing job stress. An employee assistance or human resource management partnership, *Personnel Review*. 24(1): 41-50.

Musa, R. A. (2009). Validation and psychometric properties of Bahasa Malaysia version of the depression anxiety and stress scales (DASS) among diabetic patients. *MJP Online Early*. 18 (2): 1-6.

National Institutes of Occupational Safety and Health, NIOSH. (1999). Stress at work. Retrieved from: http://www.cdc.gov/niosh/jobstrss.html.

Nicola Cherry. (1978). Stress, anxiety and work: A longitudinal study. *Journal of Occupational Psychology*. 5: 259-270

Niedhammer, I., Chastang, J. F., & David, S. (2008). Importance of psychosocial work factors on general health outcomes in the national French SUMER survey. *Journal of Occupational Medicine*. 58: 15–24.

Nina Vokic, Poloski. (2007). Individual differences and occupational stress perceived: a Croatian survey Zagreb, Croatia University of Zagreb.

Nina Michelle. (2008). North Yorkshire Police. Skillsoft. Retrieved from: http://www.nypolfed.org.uk/assets/uploads/PDFs/100331.pdf

Northport .(2010) Core Business (Container Handling). Retrieved from : http://www.northport.com.my/core1a.php#top

Noor Hassim, Mohd Zukri. (2006). A study of occupational stress and coping strategies among correctional officers in Kedah, Malaysia. *Journal of Community Health*. 16(2).

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric Theory. 3rd edition. United States of America: McGraw-Hill, Inc.

Occupational Safety and Health Act, OSHA. (1994). Section 15: Part IV: General Duties of employer to their employees. Page: 195-196. 16th edition. MDC Publisher Sdn. Bhd.

Occupational Health and Safety Assessment Series, OHSAS 18001. (2007). Implementation and Operation. Competence, Training and Awareness. Page: 9. OHSAS Project Group Secretariat. British Standard Institution. United Kingdom.

Palmer KT, Smedley J. (2007). Work relatedness of chronic neck pain with physical findings, a systematic review. *Scandanavian Journal Work Environmental Health*. 33(3):165-191.

Park SG, Min KB, Chang SJ, Kim HC, Min JY. (2008). Job stress and depressive symptoms among Korean Employees. The effects of culture on work. *Publication Medical*. 82(3): 397- 405.

Plaisier I, Bruijn JG, Graaf R, Have MT, Beekman AT, Penninx BW (2007). The contribution of working conditions and social support to the onset of depressive and anxiety disorders among male and female employees. *Social Science Medical.*

Penang Port. (2011). Retrieved from: http://www.penangport.com.my/v3/services

Penang Port Commission (PPC). 2011. News and events. Container handling at Penang port recorded a continuous growth. Retrieved from: http://www.penangport.gov.my/events.aspx

Press Trust of India.(2011). Diabetes, Depression is A Fatal Combination. Retrieved from: http://www.ptinews.com/news/-dyalsty#dv0

Punnett, L., Fine, L.J., Keyserling, W.M., Herrin, G.D., Chaffin, D.B., (2000). Shoulder disorders and postural stress in automobile assembly work. *Scandanavian Journal of Work and Environmental Healt*h. 26 (4): 283–291.

Radiation Effects Research Foundation, RERF. (2003). RERF Glossary. Prevalence. Retrieved from: http://www.rerf.or.jp/glossary_e/prevalen.htm.

Ramli M, A. M.(2007). Translation, validation and psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS). *ASEAN Journal of Psychiatry*. 8 (2): 82-89.

Ramli Musa, Salmiah Mohd Ali, Nurul Ain Musa. (2011). Validation and psychometric properties of Bahasa Malaysia version of the depression anxiety and stress scales (DASS) among diabetic patient. *MJP Online Early*. 18(2).

Ramli M. Personal communication through mail. November 23. 2011

Randall R. Cottrell, James F. McKenzie (2011). Health promotion and education research methods: using the five-chapter, thesis/dissertation model. United Kingdom. Jones and Bartlett Publishers.

Rogers, R. E., (1987). Perceptions of Organizational Stress among United State Military Officers in Germany. An Exploratory Study. *Group Organization Management.* 12(2): 189-207.

Rohany, N. (2003). *Isu-isu Kaunseling dan Perkembangan Kerjaya*. Kuala Lumpur. Utusan Publication and Distributors Sdn Bhd.

Rosen, CC. Chang, CH. Djurdjeic E., Eatough, E.M., (2010). Occupational stressors and performance: An updated review and recommendations. In: Ganster, D.C., Perrewe, P.L. New Developments in Theoretical and Conceptual Approaches to Job Stress. Bingley, United Kingdom. Page: 1-60.

Rusli. BN. (2004). Prevalence and Associated Factors of Job Related Depression in laboratory Technicians in Hospital Universiti Sains Malaysia (HUSM) and Ministry of Health Malaysia (MOH) Hospitals in Kelantan. *Medical Journal Malaysia.* 268-278.

Rusli. BN. Personal communication through mail. November 18. 2011

Rusli, B.N., (2006). Prevalence and Associated Factor of Stress In Dental Healthcare Workers of A Higher Institutions of Learning in Kelantan. *Archives of orofacial sciences.* 1:51-56

Sanchez, R. P., Bray, R. M., Vincus, A. A., & Bann, C. M. (2004). Predictor of Job Satisfaction among Active Duty and Reserve/Guard Personnel in the U.S Military. *Military Psychology, 16*(1): 19-35.

Sara Weiss, Nancy Molitor. (2007). American Psychological Association Stress. Retrieved from: http://www.apa.org/topics/stress/index.aspx.

Sauter, S., Murphy, L., Colligan, M., Swanson, N., (1999). Stress at work [DHHS (NIOSH)].99-101. Retrieved from :http://www.cdc.gov/niosh/jobstress.html

Schnall PL, Landsbergis PA, Baker D. (2001). Job Strain and Cardiovascular Disease. Annual *Review of Public Health.* 15:381-411.

Secretariat, Air Pollution & Climate. (2010). Policy initiatives. Air pollution from ships. Retrieved from: http://www.airclim.org/policy/sub6_2.php#top

Selye, H. (1974). *Stress Without Distress.* New York: J.P. Lippicott Company.

Seward , J.P., (2007). In: Joseph Ladou, *Occupational and Environmental Medicine.* Mc Graw Hill. 579-594.

Sharpley, C. F., Reynolds, R., Acosta, A., Dua, J. K. (1996), The presence, nature and effects of job stress on physical and psychological health at a large Australian university. *Journal of Educational Administration.* 34(4): 73-86

Sobeih, T.M., Salem, O., Daraiseh, N., Genaidy, A., Shell, R., (2006). Psychosocial factors and musculoskeletal disorders in the construction industry: a systematic review. *Theory Issue Ergonomics Sciences.* 7: 329-344.

Spector, P.E. (2002) Employee Control and Occupational Stress. Department of Psychology, University of South Florida, Tampa, Florida. 11(4).

Steenken, D., Voss, S., Stahlbock, R (2004) Container terminal operation, and operations research. A classification and literature review, OR Spectrum. 26(3): 19-49.

Stephen Stansfeld, Bridget Candy, (2006). Psychosocial work environment and mental health, a meta-analytic review. *Scandinavian Journal of Work, Environmental & Health.* 32(6): 443-462

Streiner, D. L. (2003). Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency. *Journal of Personality Assessment. 80*(1): 99 - 103.

Stuart, E. H., Jarvis, A., & Daniel, K. (2008). A ward without walls? District nurses' perceptions of their workload management priorities and job satisfaction. *Journal of Clinical Nursing*. 17: 3012–3020.

Thomas, K.W., Velthouse, B. A. (1990). Cognitive elements of empowerment: An interpretive model of intrinsic task motivation. *Academy of Management Review. 15*(4): 666–681.

U.S. Department of Labor (1999). Issues in labor statistics. Bureau of Labor Statistic. Summary 99-10 September 1999.

US Department of Labor. (2010).Establishing Toxic Substance Exposure. United States.

Vidal, John. (2009). Health risks of shipping pollution have been underestimated. The Guardian.

Wang J.(2005) Work stress as a risk factor for major depressive episodes. *Psychology Medical*. 35(6): 865–871.

Wang, J., & Patten, S.B. (2001) Perceived work stress and major depression in the Canadian employed population, 20-49 years old. *Journal Occupational Health Psychology*. 6(4): 283-289.

Wei-Qing Chen, T.ZW (2008) Association of Occupational Stress and Social Support with Health- related Behaviors among Chinese Offshore Oil Workers. *Journal of Occupational Health.* 50: 262-269.

World Health Organization. (1999). Protecting workers health. Series No-3-Work organization and Stress. WHO, Geneva

World Health Organization. (2007). WHO Constitutions of the World Health Organization. Retrieved from: http://www.int/governance/eb/who_constitution_en.pdf

APPENDIX 1

- **Approval letter from the company**

PENANGPORT

PENANG PORT SDN. BHD. (283544D)
CSU HUMAN RESOURCES
No. 1, Pesara King Edward
10300 Georgetown, Penang, Malaysia

T 604 210 2260
F 604 264 1839
www.penangport.com.my

ISO 9001:2008
CERT. NO. KLR 0500402

NO. RUJUKAN : AE 702
TARIKH : 22 Disember 2011

NORWAHIDA BINTI YAKUB @ YAAKUB
No 26, Lorong 22
Taman Guar Perahu
Kubang Semang
14400 Bukit Mertajam
Pulau Pinang

PERMOHONAN MENJALANKAN KAJI SELIDIK DI PENANG PORT SDN. BHD.

Dengan hormatnya saya merujuk kepada surat daripada saudari berhubung dengan perkara di atas.

2. Sukacita dimaklumkan bahawa Penang Port bersetuju menerima permohonan saudari menjalankan kaji selidik di sini mulai **3 Januari 2012 hingga 1 Mac 2012.**

3. Saudari akan ditempatkan di bahagian berikut :-

CSU / SBU	Nama Pegawai	Jawatan Pegawai	Lokasi
Kontena	En. Mazlan bin Abdul Mutaliff	Eksekutif Kanan OSHE	Ting. 5, Bangunan Pangkalan Kontena Butterworth Utara (PKBU/NBCT)

4. Saudari dikehendaki melapor diri ditempat dan masa seperti berikut :-

Tarikh : ***3 Januari 2012 (Selasa)***
Tempat : ***Ting. 5, Bangunan Pangkalan Kontena Butterworth Utara (PKBU/NBCT), Jalan Dato' Haji Ahmad Said Butterworth, Pulau Pinang***
Masa : ***9.00 pagi***

5. Sila kembalikan keratan jawapan dibawah ini sebagai pengesahan samada menerima atau tidak tawaran tersebut.

APPENDIX 2

- **Ethical approval from Medical Research Ethics Committee of the Faculty of Medical and Health Science, UPM**

APPENDIX 3

- ***"Pengakuan Bersumpah"*** **from organization management Corporate Strategic Unit Human Resources, Penang Port**

APPENDIX 4

- **Respondent Information Sheet**
- **Respondent Consent Letter**
- **Questionnaires**
  - **Job Content Questionnaire (JCQ)**
  - **Depression Anxiety Stress Scale (DASS 21-Items)**

UNIT KESIHATAN PESEKITARAN DAN PEKERJAAN
JABATAN KESIHATAN KOMUNITI
FAKULTI PERUBATAN DAN SAINS KESIHATAN

BORANG SOAL SELIDIK

TAJUK KAJIAN: Prevalens Tekanan Pekerjaan dan Faktor Psikologi di Kalangan Operator Kren

Adalah dimaklumkan bahawa satu kajian mengenai Prevalens Tekanan Pekerjaan dan Faktor Psikologi di Kalangan Operator Kren sedang dijalankan. Sehubungan dengan itu, sukacita dimaklumkan bahawa tuan telah terpilih sebagai responden dalam kajian ini.

TERIMA KASIH DI ATAS KERJASAMA ANDA

ID RESPONDEN : | | | |

TARIKH : _____

MASA : _____

FAKULTI PERUBATAN DAN SAINS KESIHATAN
FACULTY OF MEDICINE AND HEALTH SCIENCES
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

PENERANGAN KEPADA RESPONDEN

TAJUK KAJIAN:

Prevalens tekanan pekerjaan di kalangan operator kren terminal kontena.

Terima kasih kerana membantu kami di dalam kajian ini.

Apakah kajian ini?

Operator kren merupakan pekerja yang terlibat dalam mengendalikan kren di terminal kontena. Antara faktor-faktor pendedahan terhadap operator kren ialah beban kerja dan tekanan pekerjaan. Faktor psikologi boleh menyumbangkan kepada penurunan pencapaian seorang pekerja. Antara faktor yang terlibat dalam faktor fizikal ialah kemurungan, kebimbangan dan tekanan. Pendedahan kepada tekanan pekerjaan berhubungkait dengan kemurungan, kebimbangan dan tekanan dimana ia dapat menghalang operator kren bekerja dengan baik. Berdasarkan maklumat yang diperoleh dari kajian ini beberapa usaha boleh dijalankan bagi menangani masalah tekanan pekerjaan.

Apakah tujuan kajian ini?

Kajian ini dijalankan bertujuan untuk mengkaji hubungan tekanan kerja di kalangan operator kren yang bekerja di terminal kontena. Kajian ini menentukan sama ada operator kren mengalami tekanan atau pun tidak semasa menjalankan aktiviti seharian di tempat kerja.

Berapa ramai responden yang terpilih?

Anda akan dipilih dari kalangan operator kren yang bekerja di terminal kontena. Semua orang yang bersetuju untuk mengambil bahagian dalam kajian ini akan dipilih.

Apakah jenis ujian yang akan dijalankan?

Semua responden akan diberikan borang soal selidik untuk diisi sendiri oleh responden.

Adakah bayaran dikenakan?

Pengkaji akan menanggung segala pembiayaan dan tiada sebarang bayaran dikenakan terhadap setiap responden.

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UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

Adakah maklumat dijamin sulit?

Semua maklumat yang diberikan oleh responden di dalam borang kaji selidik adalah dijamin sulit. Tiada huraian responden akan dibuat pada mana-mana bahagian di dalam kajian atau penerbitan.

Adakah hak anda?

Kajian ini adalah secara sukarela. Oleh itu, Anda mempunyai hak untuk menarik diri dari penyertaan dalam kajian ini pada bila-bila masa sekiranya responden merasa tidak selesa untuk memberikan maklumat kepada pengkaji.

Apakah yang harus anda lakukan?

Anda dikehendaki menandatangani borang penyertaan responden yang menyatakan minat anda untuk menyertai kajian ini. Ianya boleh dilakukan setelah anda membaca dan memahami isi kandungan penerangan ini. Borang penyertaan responden haruslah dikembalikan kepada penyelidik sebelum ujian dijalankan. Sekiranya anda mempunyai sebarang kemusykilan, penyelidik akan membantu untuk memberi maklumat yang selanjutnya.

Terima kasih atas kerjasama dan bantuan anda.

NORWAHIDA BT YAKUB @ YAAKUB
Penyelidik
B. Sc. Kesihatan Persekitaran dan Pekerjaan
Unit Kesihatan Persekitaran dan Pekerjaan
Jabatan Kesihatan komuniti
Fakulti Perubatan dan Sains Kesihatan
Universti Putra Malaysia.

012-4417411
norwahidayaakub@gmail.com

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FACULTY OF MEDICINE AND HEALTH SCIENCES
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG PERSETUJUAN RESPONDEN

TAJUK KAJIAN : Prevalens tekanan pekerjaan di kalangan operator kren

PENYELIDIK : NORWAHIDA BT YAKUB @ YAAKUB

Saya.....No.K/P.....
alamat.....
..... bersetuju untuk menyertai kajian bertajuk seperti di atas.

Saya telah membaca dan memahami isi kandungan kajian berdasarkan apa yang telah dinyatakan di dalam 'PENERANGAN KEPADA RESPONDEN' yang telah dilampirkan bersama surat kebenaran ini dan penerangan tambahan daripada penyelidik.

Saya faham bahawa kajian ini dijalankan untuk mengetahui **Prevalens tekanan pekerjaan di kalangan operator kren di terminal kontena**.

Saya juga faham bahawa segala maklumat yang diberikan dan segala keputusan yang saya perolehi adalah sulit dan hanya akan digunakan untuk tujuan penyelidikan dan rujukan penyelidik.

Saya juga faham bahawa maklumat ini boleh digunakan untuk penerbitan tetapi setiap responden tidak akan dinyatakan identitinya.

Saya faham bahawa saya mempunyai hak untuk menarik diri dan juga mempunyai hak untuk menarik semula keizinan pada bila-bila masa sekiranya perlu apabila merasa tidak selesa pada mana-mana ujian atau aktiviti yang dijalankan oleh penyelidik semasa kajian dijalankan dan tiada sebarang tindakan boleh dikenakan ke atas saya atas tindakan tersebut.

Tandatangan .....
(*Responden*)

Tandatangan .....
(Saksi)

Tarikh :.....

Tarikh :.....

Saya mengesahkan bahawa saya telah menjelaskan kepada responden sifat dan tujuan penyelidikan klinikal yang tersebut di atas.

Tarikh .....

Tandatangan .....
(Penyelidik)

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UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG PERSETUJUAN MAKLUM BALAS RESPONDEN

TAJUK KAJIAN : Prevalens tekanan pekerjaan di kalangan operator kren

PENYELIDIK : NORWAHIDA BT YAKUB @ YAAKUB

Saya.....No.K/P.....
alamat.....
..... bersetuju untuk memohon keputusan daripada kajian bertajuk seperti di atas.

Saya faham bahawa kajian ini dijalankan untuk mengetahui Prevalens tekanan pekerjaan dan faktor psikologi di kalangan operator kren di kontena terminal.
Saya juga faham bahawa segala maklumat yang diberikan dan segala keputusan yang saya perolehi adalah sulit dan hanya akan digunakan untuk tujuan penyelidikan dan rujukan penyelidik.

Dibawah terdapat butiran saya untuk proses penghantaran keputusan daripada kajian ini.
No.telefon : .....
Email : .....

Tandatangan ..... Tandatangan .....
(*Responden*) (*Saksi*)

Tarikh :..... Tarikh :.....

Saya mengesahkan bahawa saya akan memberikan keputusan kajian ini kepada responden.

Tarikh ..... Tandatangan .....
(Penyelidik)

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UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

SOAL SELIDIK SOSIODEMOGRAFI

ARAHAN: Sila jawab semua soalan dengan menandakan pilihan jawapan yang paling sesuai dengan pekerjaan anda. Jika anda merasakan tiada jawapan yang paling tepat, sila tandakan jawapan yang paling hampir sekali.

BAHAGIAN 1: LATAR BELAKANG RESPONDEN

a) Berapa umur anda?

Sila nyatakan _____ tahun

b) Bangsa

☐ Melayu
☐ Cina
☐ India
☐ Lain-lain. Sila nyatakan _____

c) Status perkahwinan

☐ Bujang
☐ Berkahwin
☐ Bercerai/Berpisah

d) Tahap pendidikan

☐ Sekolah rendah
☐ Sekolah menengah rendah (SRP/ PMR)
☐ SPM
☐ STPM

2 a) Pendapatan bulanan (gaji pokok): RM_____

b) Pendapatan bulanan (gaji pokok + elaun): RM_____

c) Nyatakan tempoh keseluruhan anda telah bekerja sebagai kren operator RTG & QGC: _____ tahun

3) Jika anda menghadapi sebarang penyakit sila nyatakan :

_____

JOB CONTENT QUESTIONNAIRE

ARAHAN: Sila jawab semua soalan dengan menandakan pilihan jawapan yang paling sesuai dengan pekerjaan anda. ***Jika anda merasakan tiada jawapan yang paling tepat, sila tandakan jawapan yang paling hampir sekali.***

Bagi soalan di bawah, sila tandakan (√) di dalam petak jawapan yang paling hampir

	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
3. Pekerjaan saya memerlukan saya mempelajari perkara baru.				
4. Pekerjaan saya melibatkan kerja yang berulang-ulang.				
5. Pekerjaan saya memerlukan kreativiti.				
6. Pekerjaan saya membenarkan saya membuat keputusan sendiri.				
7. Pekerjaan saya memerlukan kemahiran yang tinggi.				
8. Semasa bekerja, kebebasan saya membuat keputusan sendiri adalah amat terbatas.				
9. Semasa bekerja, saya berupaya melakukan berbagai perkara yang berbeza-beza.				
10. Saya mempunyai banyak hak untuk menentukan pekerjaan saya.				
11. Saya berpeluang untuk mengembangkan kebolehan saya.				

12. Berapa ramaikah orang yang bertugas dalam kumpulan atau unit anda?
☐1. Saya kerja berseorangan ☐2. 2 – 5 orang ☐3. 6 – 10 orang
☐4. 10 – 20 orang ☐5. Lebih 20 orang

13a. Saya cukup berpengaruh ke atas keputusan dalam kumpulan saya.
☐1. Saya kerja berseorangan ☐2. Sangat tidak setuju ☐3. Tidak setuju
☐4. Setuju ☐5. Sangat setuju

13b. Kumpulan kerja saya membuat keputusan secara demokrasi.
☐1. Saya kerja berseorangan ☐2. Sangat tidak setuju ☐3. Tidak setuju
☐4. Setuju ☐5. Sangat setuju

14. Saya mempunyai sedikit peluang bagi cadangan saya dipertimbangkan dalam dasar syarikat (seperti urusan berkaitan gaji, pemecatan pekerja, pembelian alatan baru dan sebagainya).
☐1. Sangat tidak setuju ☐2. Tidak setuju ☐3. Setuju ☐4. Sangat setuju

15. Sebahagian daripada kerja saya ialah menyelia orang lain.
☐1. Tidak ☐2. Ya, 1 – 4 orang ☐3. Ya, 5 – 10 orang
☐4. Ya, 11 – 20 orang ☐5. Ya, Lebih 20 orang

16. Saya adalah ahli persatuan atau kesatuan pekerja. ☐1. Ya ☐2. Tidak

Jika Ya untuk soalan 16, sila jawap soalan 17 dan 19. Jika Tidak, sila terus ke soalan 19.
Bagi soalan di bawah, sila tandakan (√) di dalam petak jawapan yang paling hampir

	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
17. Kesatuan kerja saya mempunyai pengaruh besar terhadap polisi syarikat.				
18. Saya mempunyai pengaruh terhadap polisi kesatuan atau Persatuan Sekerja.				

	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
19. Pekerjaan saya memerlukan saya bekerja dengan sangat pantas.				
20. Pekerjaan saya memerlukan saya bekerja bersungguh-sungguh.				
21. Pekerjaan saya memerlukan kekuatan fizikal yang tinggi.				
22. Saya tidak diminta /disuruh untuk melakukan kerja-kerja secara berlebihan.				
23. Saya mempunyai masa yang cukup untuk menyiapkan kerja saya.				
24. Pekerjaan saya sering memerlukan saya mengalih atau mengangkat benda-benda berat.				
25. Pekerjaan saya memerlukan aktiviti fizikal yang cepat dan berterusan.				
26. Saya bebas daripada tekanan-tekanan yang dibuat oleh orang lain.				
27. Pekerjaan saya memerlukan penumpuan yang sepenuh-nya terhadap sesuatu tugas dalam jangkamasa yang lama.				
28. Tugas saya sering terganggu sebelum ianya dapat disiapkan dan memerlukan perhatian semula pada waktu yang lain.				
29. Pekerjaan saya sangat sibuk.				
30. Saya sering bekerja dengan kedudukan tubuh yang tidak selesa dalam jangkamasa yang lama.				

31. Saya terpaksa bekerja dengan kedudukan kepala atau lengan yang tidak selesa dalam jangkamasa yang lama.				
32. Menunggu kerja-kerja daripada orang atau jabatan lain kerap melambatkan kerja-kerja saya.				

33. Berapa stabilkah kerja anda?

☐1. Tetap dan stabil ☐2. Bermusim ☐3. Kerap tergendala
☐4. Bermusim dan kerap tergendala ☐5. Lain-lain

34. Pekerjaan saya dijamin baik.
☐1. Sangat tidak setuju ☐ 2. Tidak setuju ☐ 3. Setuju ☐ 4. Sangat setuju

35. Dalam tempoh setahun lepas, berapa kerap anda berdepan dengan masalah kehilangan pekerjaan atau kerja-kerja yang sering tergendala?
☐1. Tidak pernah ☐ 2. Sekali ☐3. Lebih dari sekali
☐ 4. Sentiasa ☐ 5. Sememangnya diberhentikan

36. Kadangkala seseorang itu hilang pekerjaan tetap mereka. Adakah kemungkinan anda akan kehilangan pekerjaan anda sekarang dalam beberapa tahun lagi?
☐1. Tidak mungkin sama sekali ☐ 2. Ada sedikit kemungkinan
☐3. Ada kemungkinan ☐ 4. Kemungkinan besar

Bagi soalan di bawah, sila tandakan (√) di dalam petak jawapan yang paling hampir

	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
37. Harapan saya untuk dinaikkan pangkat dan mempertingkatkan kerjaya saya adalah cerah.				
38. Kemahiran saya masih lagi berguna dalam tempoh lima tahun.				

	Tidak terdedah	Saya terdedah tetapi ia merupakan masalah kecil	Saya terdedah dan ia merupakan masalah besar
39. Adakah anda mempunyai masalah pendedahan kepada bahan kimia yang merbahaya semasa bekerja?			
40. Adakah anda mempunyai masalah pendedahan kepada pencemaran udara akibat habuk, asap,bahan semburan, fiber atau sebagainya semasa bekerja?			
41. Adakah anda menghadapi masalah terdedah kepada bahan yang diletak atau disimpan secara berbahaya semasa bekerja?			
42. Adakah anda menghadapi masalah terdedah kepada kawasan yang kotor atau tidak terjaga di tempat kerja anda?			
43. Adakah anda menghadapi risiko untuk mendapat penyakit semasa bekerja?			
44. Adakah anda mempunyai masalah berdepan dengan peralatan, kelengkapan atau mesin berbahaya?			
45. Adakah anda menghadapi masalah terdedah kepada kebakaran, melecur atau renjatan?			

Sila pilih satu jawapan sahaja bagi soalan 46 di bawah :

46. Semasa bekerja, berapa kuatkah anda perlu bercakap supaya suara anda didengari oleh seseorang yang berada bersebelahan dengan anda?
☐1 Berbisik
☐2.Suara yang biasa

☐3.Suara yang kuat
☐4. Menjerit

Bagi soalan di bawah, sila tandakan (√) di dalam petak jawapan yang paling hampir

	Tidak terdedah	Saya terdedah tetapi ia merupakan masalah kecil	Saya terdedah dan ia merupakan masalah besar
47. Adakah anda terdedah kepada carakerja yang merbahaya semasa bekerja?			

	Saya tiada penyelia	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
48. Penyelia saya mengambil berat mengenai kebajikan orang bawahannya.					
49. Penyelia saya memberikan perhatian terhadap apa yang saya katakan.					
50. Saya terdedah kepada kemarahan atau percanggahan pendapat dengan penyelia saya.					
51. Penyelia memberi bantuan dalam memastikan kerja-kerja saya dapat disiapkan.					
52. Penyelia saya berjaya mengajak orang lain bekerja bersama-sama.					

	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
53. Rakan-rakan sekerja saya berkemampuan dalam melakukan kerja mereka.				
54. Rakan-rakan sekerja mengambil berat tentang saya.				
55. Saya terdedah kepada kemarahan dan percanggahan pendapat dengan mereka yang bekerja dengan saya.				
56. Rakan-rakan sekerja saya adalah peramah.				
57. Rakan-rakan saya sering memberi galakan antara satu sama lain untuk bekerjasama.				
58. Rakan-rakan sekerja saya membantu bagi memastikan kerja- kerja disiapkan.				
59. Saya sering mendapat maklumbalas langsung atau sebaliknya mengenai perasaan pelanggan terhadap perkhidmatan ataupun barangan yang saya hasilkan.				
60. Saya selalu mengenali pelanggan atau pengguna secara peribadi semasa bertugas.				
61. Bagaimanapun, pelanggan atau pengguna dapat mempengaruhi jenis barangan atau perkhidmatan yang saya hasilkan.				
62. Saya boleh mempengaruhi apa yang pelanggan atau pengguna mahukan.				
62. Saya boleh mempengaruhi apa yang pelanggan atau pengguna mahukan.				
63. Kepuasan pelanggan merupakan cabaran utama bagi tugas saya.				

64. Saya terdedah kepada kemarahan atau cemuhan pelanggan atau pengguna.				
	Sangat tidak setuju	Tidak setuju	Setuju	Sangat setuju
65. Pengetahuan saya tentang kepuasan pelanggan merupakan punca utama saya merasa amat penting dan berguna dalam melaksanakan tugas saya.				
66. Unit atau kumpulan kerja saya memberikan sumbangan yang penting kepada masyarakat.				
67. Saya dihormati dan diberikan ganjaran yang sewajarnya oleh majikan untuk kerja-kerja daripada penyelia saya.				
68. Kebolehan dan kemahiran saya adalah amat penting bagi unit atau kumpulan kerja saya.				
69. Saya mendapat maklumat atau maklumbalas tentang keupayaan saya melaksanakan kerja-kerja daripada penyelia saya.				
70. Saya menghasilkan keseluruhan barangan ataupun perkhidmatan semasa bertugas, iaitu sumbangan saya terhadap keluaran barangan/perkhidmatan tersebut dapat dilihat dengan jelas.				
71. Saya mendapat maklumat atau maklumbalas berkenaan prestasi kerja saya daripada rakan-rakan sekerja.				

BAHAGIAN II. Sila tandakan satu jawapan sahaja bagi soalan 1 hingga 5 :

1. Adakah anda berpuashati dengan pekerjaan anda?
   - ☐ 1. Tidak sama sekali
   - ☐ 2. Tidak begitu berpuashati
   - ☐ 3. Agak berpuashati
   - ☐ 4. Sangat berpuashati

2. Adakah anda menasihati rakan anda untuk bekerja seperti ini?
   - ☐ 1. Menasihati **'jangan'**
   - ☐ 2. Agak ragu-ragu
   - ☐ 3. Mencadangkan dengan bersungguh-sungguh

DALAM TEMPOH **12 BULAN LEPAS**, ADAKAH ANDA MENGALAMI PERKARA-PERKARA SEPERTI BERIKUT

3. Adakah anda mahu bekerja seperti ini lagi?
   - ☐ 1. Dengan penuh kerelaan
   - ☐ 2. Memikirkannya semula
   - ☐ 3. Tidak sama sekali

4. Apakah kemungkinan anda mendapat kerja baru di tahun hadapan?
   - ☐ 1. Sangat berkemungkinan
   - ☐ 2. Agak mungkin
   - ☐ 3. Tidak mungkin sama sekali

5. Adakah pekerjaan anda sekarang ini sama dengan apa yang anda pohon dahulu?
   - ☐ 1. Sangat serupa
   - ☐ 2. Agak serupa
   - ☐ 3. Tidak serupa sama sekali

Bagi soalan di bawah, sila tandakan (√) di dalam petak jawapan yang paling hampir

	Kerap	Sekali sekala	Jarang -jarang	Tidak pernah
6. Adakah anda kerap merasa cepat penat?				
7. Adakah anda mengalami sakit di bahagian bawah belakang?				
8. Adakah anda mengalami sakit di bahagian leher atau sebelah atas belakang?				
9. Apakah anda mempunyai masalah bernafas?				
10. Adakah anda mengalami masalah sakit, sakit mencucuk-cucuk atau merasa ketat dada?				
11. Adakah anda mengalami masalah tangan menjadi kebas, sejuk dan berpeluh-peluh?				
12. Adakah anda mengalami masalah merasa tegang, gementar atau kaku?				
13. Adakah anda mengalami kurang selera makan?				
14. Adakah anda merasa susah untuk tidur?				
15. Adakah anda merasa susah untuk tidur nyenyak?				

Bagi soalan 16 hingga 18a, sila pilih satu jawapan sahaja :

DALAM TEMPOH **12 BULAN LEPAS**, ADAKAH ANDA MENGALAMI PERKARA-PERKARA SEPERTI BERIKUT

16. Adakah anda menghidap tekanan darah tinggi?
☐1. Ya ☐ 2. Sedikit tinggi ☐ 3. Tidak ☐ 4. Tidak tahu

17. Adakah anda mengambil penenang atau ubat tidur?
☐1. Kerap ☐ 2. Sekali-sekala ☐ 3. Jarang-jarang ☐ 4. Tidak pernah

18. Adakah anda merokok? ☐ 1. Ya ☐ 2. Tidak

18a. Jika anda merokok, berapa batang sehari?
☐ 1. Kurang 10 batang ☐ 2. 10-20 batang ☐ 3. Lebih 20 batang

Dass, Anxiety, Stress Scale (DASS 21-ITEMS)

Sila baca setiap kenyataan di bawah dan **BULATKAN** pada nombor 0,1,2 atau 3 bagi menggambarkan keadaan anda **sepanjang minggu yang lalu**. Tiada jawapan yang betul atau salah. Jangan mengambil masa yang terlalu lama untuk menjawab mana-mana kenyataan.

DASS mengandungi 21 soalan

Skala pemarkahan adalah seperti berikut:

0 **Tidak langsung** menggambarkan keadaan saya

1 **Sedikit atau jarang-jarang** menggambarkan keadaan saya.

2 **Banyak atau kerapkali** menggambarkan keadaan saya.

3 **Sangat banyak atau sangat kerap** menggambarkan keadaan saya

	SOALAN	**SKOR**			
1	Saya dapati diri saya sukar ditenteramkan	0	1	2	3
2	Saya sedar mulut saya terasa kering	0	1	2	3
3	Saya tidak dapat mengalami perasaan positif sama sekali	0	1	2	3
4	Saya mengalami kesukaran bernafas (contohnya pernafasan yang laju, tercungap-cungap walaupun tidak melakukan senaman fizikal)	0	1	2	3
5	Saya sukar untuk mendapatkan semangat bagi melakukan sesuatu perkara	0	1	2	3
6	Saya cenderung untuk bertindak keterlaluan dalam sesuatu keadaan	0	1	2	3
7	Saya rasa menggeletar (contohnya pada tangan)	0	1	2	3
8	Saya rasa saya menggunakan banyak tenaga dalam keadaan cemas	0	1	2	3
9	Saya bimbang keadaan di mana saya mungkin menjadi panik dan melakukan perkara yang membodohkan diri sendiri	0	1	2	3
10	Saya rasa saya tidak mempunyai apa-apa untuk diharapkan	0	1	2	3

11	Saya dapati diri saya semakin gelisah	0	1	2	3
12	Saya rasa sukar untuk relaks	0	1	2	3
13	Saya rasa sedih dan murung	0	1	2	3
14	Saya tidak dapat menahan sabar dengan perkara yang menghalang saya meneruskan apa yang saya lakukan	0	1	2	3
15	Saya rasa hampir-hampir menjadi panik/cemas	0	1	2	3
16	Saya tidak bersemangat dengan apa jua yang saya lakukan.	0	1	2	3
17	Saya tidak begitu berharga sebagai seorang individu	0	1	2	3
18	Saya rasa yang saya mudah tersentuh	0	1	2	3
19	Saya sedar tindakbalas jantung saya walaupun tidak melakukan aktiviti fizikal (contohnya kadar denyutan jantung bertambah, atau denyutan jantung berkurangan)	0	1	2	3
20	Saya berasa takut tanpa sebab yang munasabah	0	1	2	3
21	Saya rasa hidup ini tidak bermakna	0	1	2	3

APPENDIX 5

- **Permission letter to do research project**

APPENDIX 6

- **Appoint Letter for Site Supervisor**

APPENDIX 7

- **Respondent Working Schedule**

PENANGPORT

PENANG PORT SDN. BHD. (283544D)
OPERATION (NBCT) UNIT
SBU CONTAINER
North Butterworth Container Terminal
4952 Jalan Dato' Haji Ahmad Said
12000 Butterworth, Penang, Malaysia

T 604 310 2512
F 604 323 8699

www.penangport.com.my

JADUAL TUGAS (YOS ,VOS -KERANI CONTRL -KERANI OPERASI JAN-FEB-MAR 2012

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL
KUMP A		1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3	
KUMP B		2	3	3			1	1	2	2	3	3			1	1	2	2	3	3					2	2	3	3			1
KUMP C			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2					1	1	2	2	3
KUMP D		3			1	1	2	2	3	3			1	1	2	2	3	3			1	1			3	3			1	1	2

FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB		
KUMP A		1	1	2		3				1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2		
KUMP B	1	2	2	3				1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3		
KUMP C	3			1		2		3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1		
KUMP D	2	3	3			1		2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3				

MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM SAB		AHD	ISN	SEL	RAB	KAM	JUM	SAB
KUMP A	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2
KUMP B			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3
KUMP C	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1
KUMP D	1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3			1	1	2	2	3	3	

1 JAN TAHUN BARU

23 JAN -24 JAN TAHUN BARU CINA

5 FEB HARI KEPUTRAAN NABI MUHD SAW

7 FEB THAIPUSAM

APPENDIX 8

- **Final Year Project Plan**

PREVALENCE OF OCCUPATIONAL STRESS AMONG CRANE OPERATORS IN A CONTAINER TERMINAL, AT THE PENANG

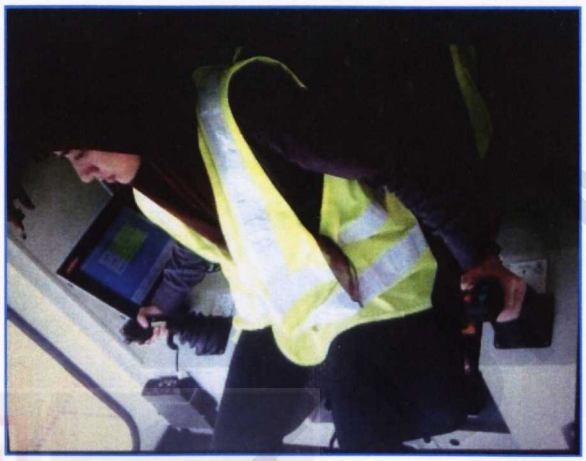
Final Year Project 2011/12 (Project Plan)

Year	2011																2012															
Month	SEP				OCT				NOV				DEC				JAN				FEB				MAC				APR				MAY			
Tasks\ Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Draft Proposal																																				
Collect Information																																				
Obtaining Permission																																				
Pre Testing																																				
Draft Chapter 1,2,3																																				
Data Collection																																				
Data Analyze																																				
Prepare Final Draft																																				

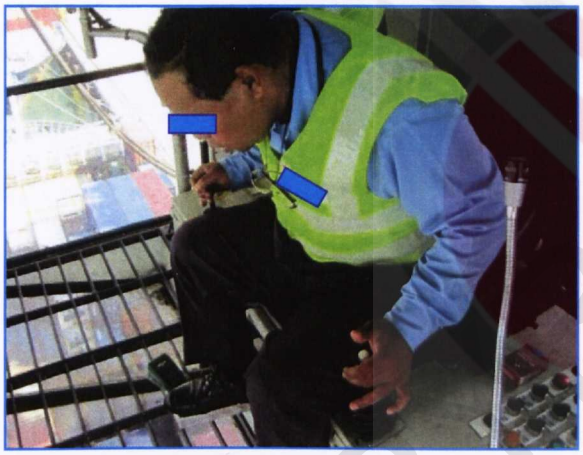
APPENDIX 9

- **Photograph**

Briefing from the leader before agreed with study



Researcher is trying to handle the crane



The crane operators do their task as usual

The vessel hole where the container will be stacked