

**PREVALENCE AND FACTORS AFFECTING JOB STRAIN  
AMONG WORKERS IN AN ELECTRONIC FACTORY**

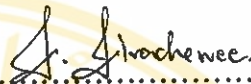


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OF THE REQUIREMENTS FOR  
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FACULTY OF GRADUATE STUDIES  
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Thesis  
entitled

**PREVALENCE AND FACTORS AFFECTING JOB STRAIN  
AMONG WORKERS IN AN ELECTRONIC FACTORY**



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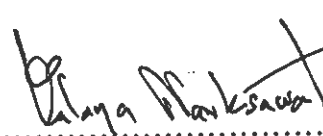
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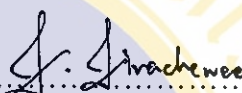
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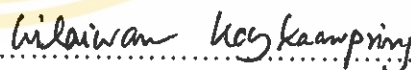
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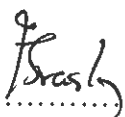
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**PREVALENCE AND FACTORS AFFECTING JOB STRAIN AMONG WORKERS  
IN AN ELECTRONIC FACTORY**

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**ABSTRACT**

This cross-sectional study aimed to measure the prevalence of, and determine the factors affecting job strain among workers in an electronic factory, Pathum Thani Province, Thailand. A total of 406 workers aged 18-55 years who worked at the factory for at least 6 months completed a Thai version of Karasek's Job Content Questionnaire (JCQ) from October to December, 2004. There were five scales in the JCQ questionnaire. Two scales were used to examine job strain, namely: job control and psychological job demands.

Overall, the prevalence of job strain was 23.6%. Multiple logistic regression analysis indicated that after adjusting for all other variables in the model, two variables were significantly associated with job strain: high physical job demands (adjusted OR = 4.32, 95%CI 2.26-8.26) and low supervisor support (adjusted OR = 3.09, 95%CI 1.75-5.49). It is recommended that the factory should formulate plan to decrease job strain of workers such as providing sufficient break time, providing opportunities to do a variety of tasks, offering programs in stress management and promoting good relations among workers and supervisors.

**KEY WORDS: JOB STRAIN/ WORKPLACE SOCIAL SUPPORT/ FACTORY  
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ความชุกและปัจจัยที่มีผลต่อความล้าจากการทำงานของพนักงานในโรงงานอิเล็กทรอนิกส์  
(PREVALENCE AND FACTORS AFFECTING JOB STRAIN AMONG WORKERS  
IN AN ELECTRONIC FACTORY)

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บทคัดย่อ

การศึกษากาตดัคขวางนี้มีวัตถุประสงค์เพื่อ วัดอัตราชุก และหาปัจจัยที่มีผลต่อความล้า  
จากการทำงานของพนักงานในโรงงานอุตสาหกรรมอิเล็กทรอนิกส์แห่งหนึ่งในจังหวัดปทุมธานี  
ประเทศไทย พนักงาน 406 คน อายุ 18-55 ปี และทำงานอยู่ในโรงงานอิเล็กทรอนิกส์อย่างน้อย  
6 เดือน ตอบแบบสอบถามวัดความล้าจากการทำงานของ Karasek ระหว่าง เดือน ตุลาคม ถึง  
ธันวาคม 2548 มาตรวัดความล้าจากการทำงาน ประกอบด้วย 5 ส่วน โดย 2 ส่วนที่ใช้วัดความล้า  
จากการทำงานคือ การตัดสินใจในงาน และความต้องการจากการทำงาน

ผลการศึกษา พบว่าร้อยละ 23.6 ของพนักงานมีความล้าจากการทำงานสูง ผลการ  
วิเคราะห์โดยใช้สถิติถดถอยพหุคูณจิสติก โดยควบคุมตัวแปรอื่นๆที่ใช้ในการศึกษา พบว่า ตัวแปร  
ที่มีผลต่อความล้าในการทำงาน คือ ความต้องการด้านกายภาพจากการทำงานสูง (adjusted OR =  
4.32, 95%CI 2.26-8.26) และการช่วยเหลือจากผู้บังคับบัญชาน้อย (adjusted OR = 3.09, 95%CI  
1.75-5.49) ข้อเสนอแนะจากการศึกษาครั้งนี้คือ ควรมีการวางแผนงานหรือจัดกิจกรรมเพื่อลดความ  
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ความรู้สึกรำเจ การจัดการความเครียดจากการทำงาน ตลอดจนส่งเสริมความสัมพันธ์ที่ดีระหว่าง  
พนักงานกับหัวหน้างาน

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## CHAPTER I

### INTRODUCTION

#### 1.1 Rationale and justification

Working life is changing rapidly as the economy becomes increasingly global. Mental health problem causing by stress is one of the increasing serious health problem. Generally, there are 2 types of stress in human life, stress in daily life, and occupational stress (1). There have been increasing concerns about job stress (job strain) and its adverse health effects worldwide. To be accordant with the National Institute for Occupation Safety and Health (NIOSH) (2), 130 occupations exposed to occupational stress were ranked and determined that laborer is the occupation with the highest stress. Approximately 30-50% of workers in industrialized countries experience psychological stress (3-4). Several stress and job strain studies conducted between 1989 and 1999 revealed that industrial working is the highest risk of job stress. Occupational stress is also resulted from workplace factor such as, workload, lack of autonomy and control over worker, shiftwork, wage scales, routine, and repetitive work (5-8).

The issue of job strain is very importance to the public health and working populations since the estimate economic costs of job strain could be as high as several hundred billion dollars per years (9). Job strain can be defined as the harmful physical and emotionally responses that occurred when the requirements of the job do not match the capabilities, resources, or needs of the worker (10) In Thailand, job strain has been reported as one of occupational disease since 1984 (11). Previous studies in abroad point out that job strain adverse effects will reduce factory workers working effectiveness, relationship with family, quality of products, and society if they fail to manage their stress properly. The major stressors in human life are poor job characteristics, working environment, relationship with coworkers as well as poor lifestyle (12). The examples of poor lifestyles are smoking, alcohol drinking, lack of

exercise and job stress (13-14). Workers who reporting poor lifestyles have a higher risk of getting chronic diseases such as hypertension, cardiovascular disease (CVD) and psychological stress than those reporting good lifestyles (15).

Job strain is a widespread problem in most industrialized countries. There are few reports of such studies from countries that are currently undergoing rapid industrialization. Workers usually face multiple health risks in the workplace, from lingering physical and chemical hazards to emerging psychological strain due to modern work arrangements and intensive market competition (16).

Over the past two decades, Thailand had become an industrialized country. Thousands of people are working in industrial estates near Bangkok. They are garment, electronics, parts and components of airplanes, toy cars, assembling house materials, etc. Among them, electronics factories employ the largest number of workers (17). Most people assume that electronics factories are at least clean because of precision required in manufacturing computers. However, a clean factory is not necessarily a safe factory, and many electronics workers operate in a dangerous or unhealthy environment. In a factory that makes components for laptop computers, the workers are not allow to talk, stretch or look around, and they may not leave the production line to use the toilet or drinking water. In addition, some workers live in fear of criticism from supervisors and feel under intense psychological pressure (18).

To understand the factory workers physical and psychological pressure, the job demand-control model was applied. This model is a major theoretical tool to examine job strain (5,9). According to this model, a combination of high demands and a low degree of control over a job produces adverse health effects. In addition, social support also recognized as a useful one in the measurement of job strain (18). Several well-designed studies regarding job strain, its adverse effects and risk factors have been conducted in developed countries such as United State, European countries and Japan. However, in Thailand, research on such topics is still preliminary. The application of job demand-control model to Thai workers may produce some results beneficial to formulate mental health promotion interventions to enhance factory workers skills in coping with stress and adverse effects due to job strain in the workplaces.

## 1.2 Objectives

1. To measure the prevalence of job strain among workers aged 18-55 years in one electronic factory;
2. To assess the general characteristics i.e. gender, age, education level, marital status, monthly income, number of children, job rank, and work environment among workers aged 18-55 years in one electronic factory;
3. To assess the lifestyle factors i.e. shiftwork, working hours, number of meals, smoking, alcohol drinking, and exercise among workers aged 18-55 years in one electronic factory;
4. To assess the psychosocial job factors i.e. physical job demands, job insecurity, workplace social support from coworkers and supervisors among workers aged 18-55 years in one electronic factory;
5. To identify the association between general characteristics, lifestyle factors, psychosocial job factors and job strain among workers aged 18-55 years in one electronic factory.

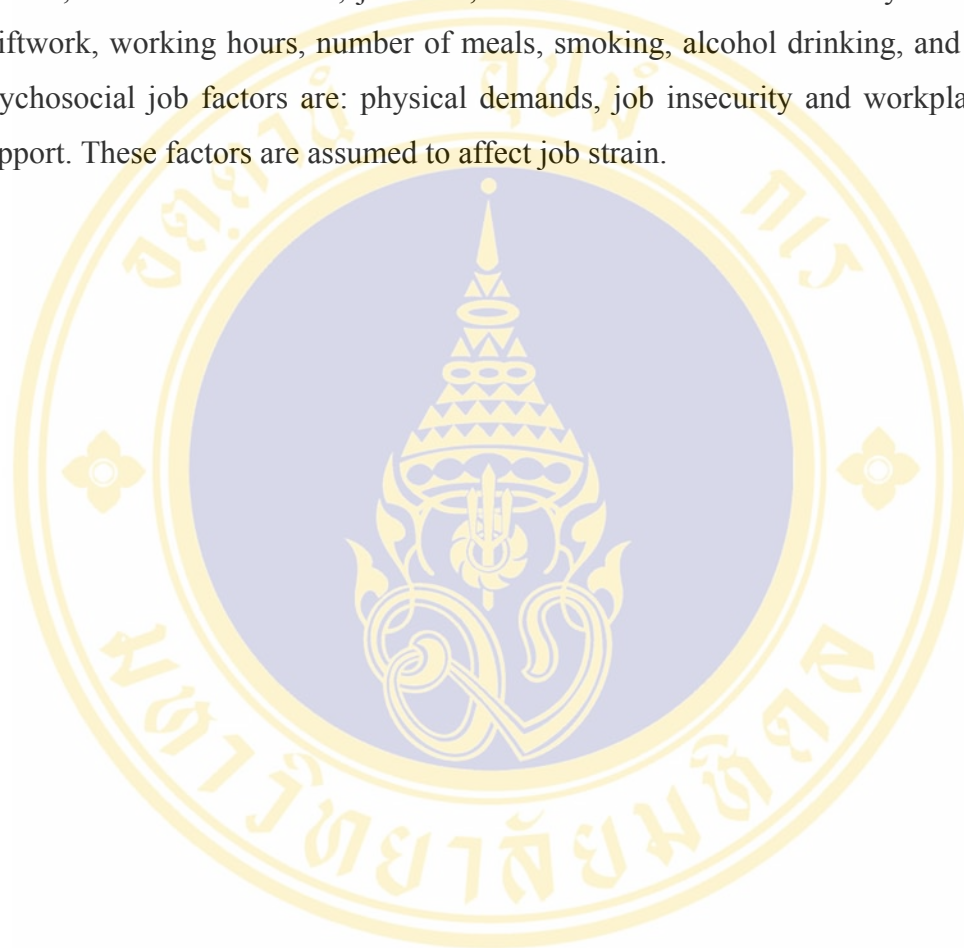
## 1.3 Hypotheses

The hypotheses of the study are:

1. There are associations between general characteristics i.e. gender, age, education level, marital status, monthly income, number of children, job rank, and work environment among workers aged 18-55 years;
2. There are associations between lifestyle factors i.e. shiftwork, working hours, number of meals, smoking, alcohol drinking, exercise and job strain among workers aged 18-55 years;
3. There are associations between psychosocial job factors, i.e. physical job demands, job insecurity, workplace social support and job strain among workers aged 18-55 years.

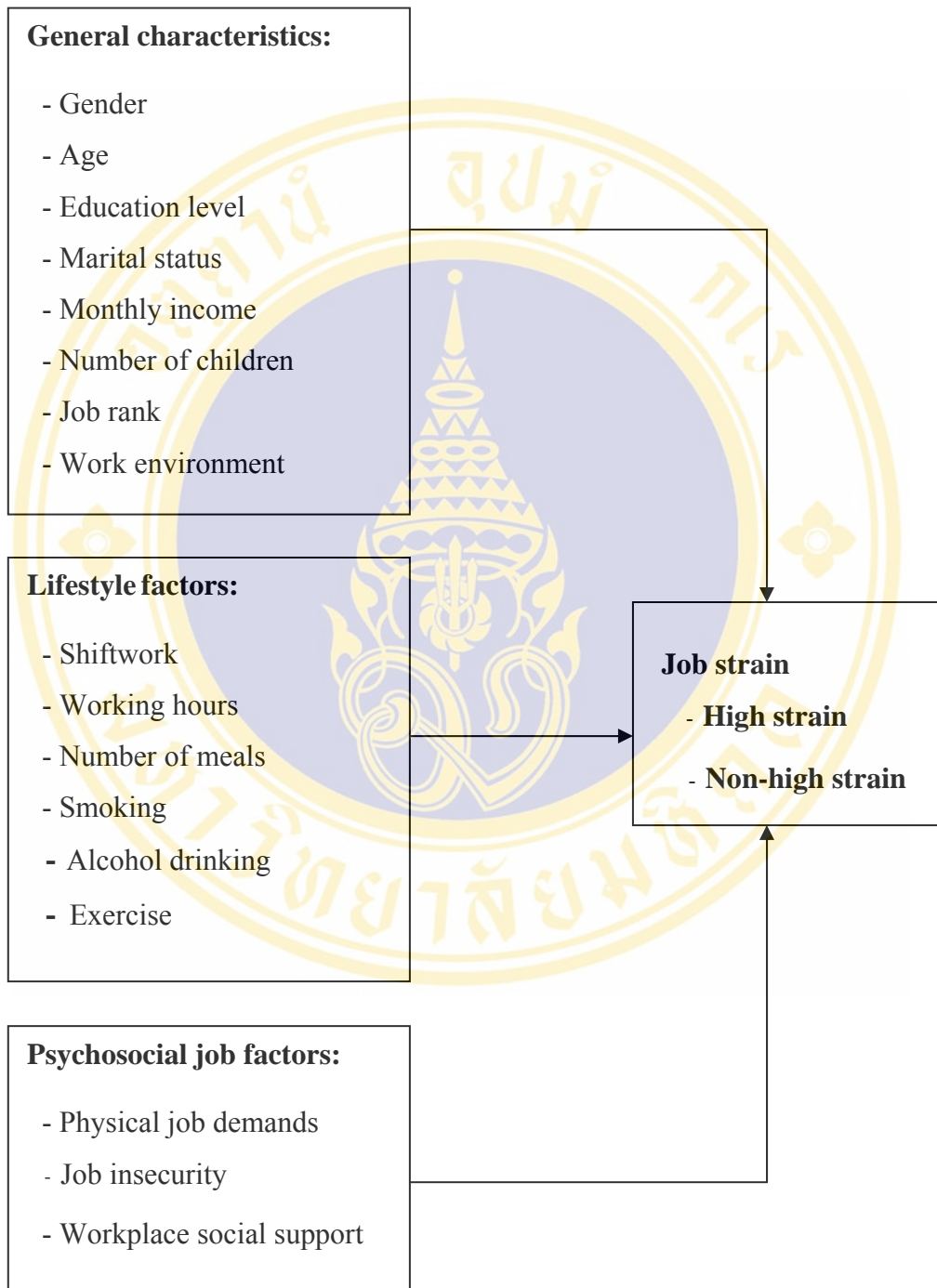
## 1.4 Conceptual framework

Figure 1 shows the factors from literature, which appears to affect job strain. General characteristics are: gender, age, education level, marital status, monthly income, number of children, job rank, and work environment. Lifestyle factors are: shiftwork, working hours, number of meals, smoking, alcohol drinking, and exercise. Psychosocial job factors are: physical demands, job insecurity and workplace social support. These factors are assumed to affect job strain.



**Independent variables**

**Dependent variable**



**Figure 1 Conceptual framework of factors affecting job strain**

## 1.5 Definitions of terms

**Job strain** is defined according to Karasek's Job Content Questionnaires (JCQ). The combination of high psychological job demand and low job control or job decision latitude (see details of measurement in chapter 3).

**Job rank** refers to the job position of the participated personnel which is divided into 3 level, i.e., high-rank, mid-level managers and general workers. **High-rank manager** refers to manager, assistant manager or equality. **Mid-level manager** refers to foreman, supervisor, leader group or equality. **Worker** refers to person who worked in factory out of two classes; for examples: engineer, secretary, operator, officer and manufacturer.

**Work environment** refers to the perception of workers regarding the aspects of physical work environment in the workplace that affect job strain. This includes factors such as exposures to loud noise, cold, poor lighting, and poor ventilation.

**Lifestyle factors** refer to health behavior related to physical and mental health status. In this study six items that used to measure lifestyle factors were: shiftwork, working hours, number of meals, smoking, alcohol drinking and exercise.

**Shiftwork** means working according to schedules made by employers which may put some pressure on an individual with muscle pain, feeling down, and lack of motivation.

**Working hours** refers to the working hours of a day and classified into: <6 hrs, 7-8 hrs, 9-10 hrs, 11-12 hrs, and >12 hrs.

**Number of meals** refers to the frequency of number of meals in a day and classified into: frequently 3 meals, 3 meals many times, frequently not 3 meals.

**Smoking** refers to smoking habits, i.e. non-smoker, former smoker and current smoker. **Non-smoker** refers to any person who has never smoked or who has smoked less than 5 times per month. **Former smoker** refers to smokers who has stopped smoking  $\geq 1$  year prior to conducting this study. **Current smoker** refers to any person who smokes a tobacco product at the time of the study or smokers who have stopped smoking <1 year prior to conducting this study.

**Alcohol drinking** refers to alcohol drinking habits such as non-drinking, former drinking and current drinking. **Non-drinker** refers to any person who has

never drunk. **Former drinker** refers drinkers who have stopped drinking  $\geq 1$  year prior to conducting this study. **Current drinker** refers to any person who drunk alcohol product at the time of the study or drinkers who stopped drinking  $< 1$  year prior to conducting this study.

**Exercise** refers to duration and frequency of doing physical exercise such as jogging, walking, aerobic that move the body continuously for at least 3 times a week and equal or more than 30 minutes for each time.

**Psychosocial job factors** refer to psychosocial factors in the workplace which included physical demands, job insecurity, and workplace social support, the supports from supervisors and coworkers.

**Physical job demands** refer to requirement of rapid physical activity and awkward body position due to individual worker's job characteristics.

**Job insecurity** refers to perceived job insecurity among study workers.

**Workplace social support** refers to help or supports from coworkers or supervisors.

## CHAPTER II

### LITERATURE REVIEW

This chapter reviews the literature covering the concept of stress, job strain; job strain model; factors affecting job strain among factory workers and reviews of relevant research findings.

#### 2.1 Concept of stress and job strain

##### 2.1.1 Stress

Stress is a situation when people feel depressed, uncomfortable, confused and afraid concerned or feel like being forced to do or not to do something. It happens when people perceive or evaluate something that comes to their lives as harassing or causing mental or physical harm. In such situation, they lose mental and/or physical balance. When people have stress, they have different ways of responses such as defense mechanism, physical changes in behavior, ways of thinking and feeling. These responses are aimed to reduce stress and bring people back to balance (19).

##### Definition of stress

There are many concepts of stress. Stress as a psychological and physical response of the body to the internal or external demand (20), a particular relationship between the person and the environment (21), or the effect of pressure occurring when a person could not respond one's needs, faced with the loss of desired things including loss of career opportunities and even employment (22). It could be concluded that stress was the response of the body to different stressors and was occurred from reaction towards individual and environment disturbance. It caused reaction through physical, mental health and behavior which made them lose social role affecting to their lifestyle.

### **The types of stress**

Engel (23) has classified stress into 2 types: 1) Physical stress: a stress occurs from something that threatens the body's tissue and stimulate hypothalamus gland to produce various physical phenomena through sympathetic nervous system. It causes a physical syndrome such as headache, insomnia, invalid stomachic system. Examples of this kind of stress stimulus are heat, cold and noise which defined as emergency or continuing stress (24); 2) Psychological stress: a mental process resulting from conflicts, frustration, worries, or from severe mental disturbance. This kind of stress can occur when a person viewing and exciting. It will strain muscles and make heart beating fast. This reaction based on past experiences through mental process.

### **Cause of stress**

Davidson & Cooper (25) described that there are 4 causes of stress: 1) Working: There are works type and factors, role in organization, job promotion, relationships at work and social support and work structure and climate; 2) Family: There is marriage relation, home environment, neighborhood, family and social support from family, neighbor or closed friend; 3) Social: There are conditions, food, travel, urban living and hobby; 4) Person is individual characteristic such as age, education and religion, the stress coping and life events.

### **Stress level**

Although stress occurring to each person came from the same source, its severity may not be equal depending on psychological, emotional, social, cultural and environmental bases. In addition, it depended on the quantity of the stressor that Janis (26) divided stress into 3 levels: 1) Low stress was a little stress that occurred in a short time. It would rapidly disappear in only minutes or hours that mostly occurred in daily living such as traffic jam, missing the appointment; 2) Moderate stress was more severe stress than the first level that may stay in hours or days and affected the person to express its consequence. This stressful source included heavy task stress, conflict between co-workers, non-severe illness, etc; 3) Severe stress was prolonged stress that may stay in weeks, months or years; 4) This stress level may come from a single or

multiple causes such as the loss of beloved person, divorce, being sentenced to imprisonment or the loss of important organs, etc.

### **The Consequence of stress**

Rice (27) explained working stress as 3 symptoms: 1) Physical symptoms: Increasing heart rate and blood pressure, increasing adrenaline and nor-adrenaline pouring, irritated gastrointestinal system, physical injury, exhaustion, die, coronary heart disease, problem of respiratory system, hyperhydrosis, skin disease, headache, cancer, muscular tension, insomnia; 2) Psychological symptoms: Worry, strain, confuse, irritate, angry, hypersensitive, high pressure, low communication affective, separate and depress, feel lonely, feel bored and unsatisfied, reduced perception, poor concentration, inactive and low self-confidence; 3) Behavioral symptoms: Less working, decreasing work efficiency, drink alcohol and drug used, smoking, over eating led to fat, less eating, depression, loss of appetite, quickly lose weight, aggressive, careless behavior, less of relationships and suicide.

#### **2.1.2 Job strain**

Job strain refers to six sources of stress: task, role, behavior setting, physical environment, social environment and characteristics that the person brings with him to the job (28). A (perceived) substantial imbalance between demand and response capability, under conditions of failure to meet demand is important.

The joint collaboration of Karasek and Theorell began and led first to the hypothesis of Swedish demand-control job strain and to heart disease finding. They defined job strain as jobs characterized by high psychological workload demand combined with low decision latitude. High job strain is hypothesized to result in biological arousal, mediated by increases in catecholamines, adrenaline, noradrenaline and blood pressure (29) and significant positive associations have been observed between job strain and CVD (30).

Job strain may produce overt psychological and physiologic disability. However, it may also have more subtle effects on personal well-being (fatigue, depression, anxiety and physical illness) and productivity (31). Job strain can be defined as the harmful physical and emotionally responses that occur when the

requirements of the job do not match the capabilities, resources, or needs of the worker. In general, the combination of high demand in a job and a low amount of control over the situation can lead to job strain (10).

That the sources of job strain can only be adequately investigated by using a multidisciplinary approach, i.e. examining the whole spectrum of psychological, sociological, and physiological problems that make demands on an individual in their working environment. Use of a multidisciplinary approach acknowledges also that stressors in the working environment can affect an individual at home and his social environment, and vice versa (32). Thus, when studying the sources and manifestations of stress in a specific occupational group, e.g., personnel in hospitals, it is essential to be aware of the importance of extra-organizational sources of stress that can affect the performance and mental and physical health of the individual at work. Several sources of job stress exist; some of these stressors are intrinsic to the job, while some are related to other factors (3).

The causes of job strain that many of workplace stressors are commonly present in the daily work environment both physical and psychological as the following (24): 1) Workplace environment such as temperature, noise, noxious odors, vibration, lighting, ventilation, unsafe or hazardous working conditions, crowding and isolation; 2) Organization such as lack of participating in decision making, non-supportive atmosphere, poor communication, lack of job security, inadequate training, no opportunity for advancement, inadequate compensation, performance evaluation done poorly or not at all, inadequate resources to accomplish job, shiftwork (particularly rotating), discriminatory practices and policies, sexual harassment, and racial inequality; 3) Job such as quantitative and qualitative overload or under load, role ambiguity, role conflict, responsibility for other people's work, lives, and safety without authority, machine-paced work, lack of control over job and pace, deadlines, and long hours or overtime; 4) Interpersonal relationships such as poor working relationships with supervisors, co-workers, subordinates, the public, other public organizations, and job roles and demands conflict with family life.

It could be concluded that there are 2 causes of job strain: Firstly, work condition is stress cause from work overload or under load, over difficult work, repeating job, job responsibility, shiftwork, long hours work, and lack of promotion;

Secondly, working environment is unsuitable worksite, low relationship with others, unclear of organization structure, restrict rules, performance appraisal, employment or welfare is not enough, lack of working motivation.

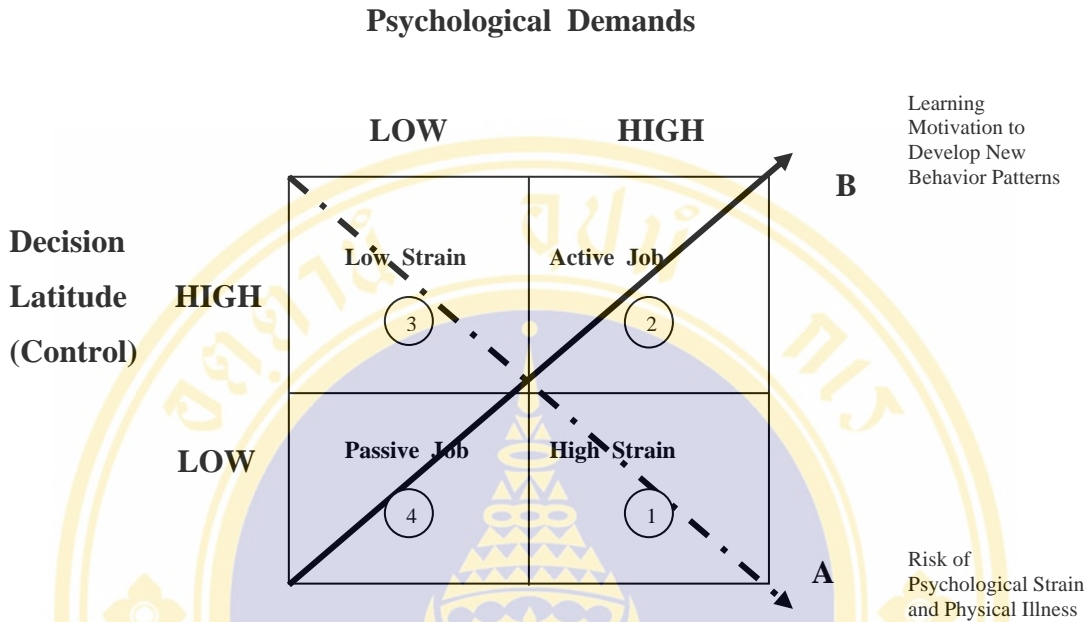
## 2.2 Job strain model

This study applied job strain model that developed by Robert Karasek (5) that has highlighted two key elements of these stressors, and has been supported by a growing body of evidence. Demand-Control Model or Karasek's Job strain model states that the greatest risk to physical and mental health from stress occurs to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands. Job demands are defined by questions such as "working very fast," "working very hard," and not "enough time to get the job done". Job decision latitude is defined as both the ability to use skills on the job and the decision-making authority available to the worker. In some recent studies, this model was expanded to include a third factor - the beneficial effects of workplace social support (6, 33).

**Demand latitude:** is defined as psychological job demand that has stressors arising from personal conflict. The research perspective is associated with job-related stress for instance role overload, role conflict, role ambiguity, load information, physical and skill utilization.

**Decision latitude:** is defined as the combination of job decision-making authority and use of skills on the job.

**Figure 2: Demand-Control Model (Job Strain Model)**



Source: Karasek RA. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Adm Sci.Q* 1979; 24: 285.

The job strain model that shows the psychosocial job demand, skill discretion, and decision authority can predict health and behavior which are consequence of work structure. Physical demand measurement and social interaction in work environment help to expand the meaning of the psychosocial work environment model.

The model has 2 dimensions and divides to 4 types of psychosocial in work which defines by interaction between psychosocial job demand and decision latitude, four types are high strain job, active job, low strain job, and passive job. Each type of job strain was described by Karasek (9) about what is the dimension compositions and how it affect to stress, health, illness, diseases and relation with job environments or structures as followings (33-34):

**Quadrant 1: High strain job;** High psychological demands, low decision latitude, and low social support.

High strain job is the situation that someone has high psychological job demand to meet some objective, targets need, or goal and other like these. But in that

situation or environments he or she has only low or few control that sufficient for responsible to the demand which functions as stressors then it causes stress and physical response.

**Quadrant 2: Active job;** High psychological demands, and high decision latitude.

Active job is the situations that have intensely demanding which relate with the workers in activities over which they feel a large measure of control the freedom to use all available skills. From such jobs we predict an optimistic set of psychosocial outcomes-learning and growth that are conducive to high productivity.

**Quadrant 3: Low strain job;** Low psychological demands, high decision latitude, and high social support.

Low strain job is the highly desirable state just described is hardly a situation of relaxation, as necessary as the latter, high strain and active jobs, is. This group was predicted that lower than average levels of residual psychological strain and risk of illness, because job decision latitude allows the individual to respond to each challenge optimally, and because there are few challenges to begin with. This is almost too good to be true, yet it does characterize certain jobs of repair personnel.

**Quadrant 4: Passive job;** Low psychological demands, and low decision latitude.

Which characterize with no energetic responses but that have none of desirable aspects of relaxation of low strain jobs. This group is a professional-level employee, previously involved in very active jobs, whose current unemployment has lead to apathetic behavior because of challenge that seemed completely beyond his control.

Passive jobs setting is the second major psychosocial work problem, which is the nature of injury it induces or the strategies to eliminating it as same as for high strain job. Loss skills, lack of job challenges and environmentally rigid restrictions preventing workers from testing their idea to improve the work process and result in long-term loss of work motivation and productivity. Passive job has an average level of psychological strain and illness risk as active jobs, and although stressor exposure would result in substantial residual psychological strain as high strain jobs, but low demand of passive job means that fewer stressors are confronted.

The job strain model (Figure 2) has two components, increasing risk of strain and disease following arrow A, but increasing activity, participation, self esteem, motivation to learn, and sense of accomplishment following arrow B. Thus, this model provides a justification and a public health foundation for efforts to achieve greater worker autonomy as well as increased workplace democracy (33).

## 2.3 Factors affecting job strain among factory workers

### Lifestyle

WHO (35) defined lifestyle as the patterns of individual behavior which correlate with society, economically and the ability to express selected behaviors. Martin (36) defined lifestyle as activities which individuals do in order to prevent sickness and help health promotion including rehabilitation for good mental and physical health. As agreed by Hubbard (37) who explained lifestyle is the practice for sustaining good mental and physical health to prevent sickness. Obviously, all definitions given are the lifestyle of general people which are different from Gillis (38) who focused more at adolescents and said that, it is the most important period of life in order to have good health in adulthood it must begin from good lifestyles when they are still teenager. Gillis explained teenager's lifestyle as the routine behavior or practice they usually do in order to prevent sickness and promote health including to sustain good health status.

From all the above mentioned, it can be concluded that lifestyle is daily routine behaviors or activities that person usually do to sustain good health and mental health in order to be fit and well in society.

**Shiftwork:** Many workers today have jobs requiring working in shift, some of which go around the clock. Studies have found that shiftwork is a common occupational stressor that effects blood temperature, metabolic rate, blood sugar level, mental efficiency, and work motivation; shiftwork also influences sleep patterns and family and social life. In one study of air traffic controllers (39), shiftwork was isolated as a major problem, although other major stressors were also present. These

workers had four times the prevalence of hypertension, and also more mild diabetes and peptic ulcers, than did a control group of second-class airmen.

**Working hours:** The long working hours required by many jobs appear to take a toll on employee health. Studies have established a link between extended shifts and deaths due to coronary heart disease. In one investigation of light-industry workers in the United States, Breslow and Buell (40) found that individuals under 45 years of age who worked more than 48 hours a week had twice the risk of those in maximum of 40 hours a week. Another study of 100 young coronary patients revealed that 25% of them had been working at two jobs, and an additional 40% worked for more than 60 hours a week. Indeed, the European Community's Social Charter has specifically attempted to limit community countries to a 48 hours working per week. Several studies showed that long hours of work are one of the possible risk factors which may cause health defects in workers (41-44). Many workers today have jobs requiring working in shift. Shiftwork is a common occupational stressor and also influences sleep patterns and family and social life. In one study of air traffic controllers, shiftwork was isolated as a major problem related to job stress (45).

**Number of meals:** Employees, who take care of their own physical health, enjoy better mental health also. Maintaining a nutritional balance by taking healthy food, eating breakfast regularly, getting sufficient sleep and doing regular physical exercise is significantly related to positive mental health (46-47).

**Smoking:** Some studies show association between job stress and smoking, they smoke in the stress situation to reduce perception of stress and increasing capacity of coping with stress will decrease suffer. Occupations, social class and intellectual are related with smoking and may both relate physical and psychological to smoking habit. Low skill women smoke cigarettes too much as same as men who did shiftwork and piece work. In the study of Schulz (46) found alcohol consumption and smoking lead to significant negative mental health among workers. Poorer mental health is reported among female smokers, compared to non-smokers (48). Regarding, some studies show association between job stress and smoking, they smoke in the stress situation to reduce perception of stress and increasing capacity of coping with stress will decrease suffer. Unsatisfied job strain can predict smoking habit but there are not conclusion from longitudinal study of job strain and smoking behavior

relationship. Occupations which are high smoking are high job demand in executive managers, engineer with whom were difficult to stop smoking. Unsatisfied job and stress can predict smoking habit but there are not conclusion from longitudinal study of job strain and smoking behavior relationship (5).

**Alcohol drinking:** Yang, et al. (49) found that 28.8% of 1,117 respondents having experienced drinking-related problems during the preceding month, and 5.2% gave escape from job stress as the reason for their drinking in the preceding month. that workers who reported high levels of job strain were more likely to experience drinking-related problems and to drink for relief but had lower levels of drinking.

Schnall, et al. (50) found that job strain was associated with an increase in systolic ambulatory blood pressure (AmBP). However, among subjects not in high-strain jobs, alcohol had no apparent effect on AmBP at work. Instead, alcohol use and job strain interacted such that workers in high-strain jobs who drank regularly had significantly higher systolic AmBP at work.

**Exercise:** Exercise is perhaps well-known and most popular to relax and reduce stress. There are several studies about physical activity or exercise related to decrease stress. The study of Winnail, et al. (51) and Ferron (52) showed that exercise among adolescents is consistently associated to lower levels of anxiety and stress, and higher levels of physical activity are inversely associated with use of substance.

### **Job-related factors**

**Job rank:** Job rank has a significant positive association with poor mental health (53). Higher the job rank greater will be the responsibility. Perceived greater responsibility is associated with poor mental health. Relationship of actual working hours with mental health of the employee is not established.

**Work environment:** One of primary factors in job stress is poor “working condition” (54). Working condition related to job stress includes the degree to which a person’s abilities and skill match the requirements on the job and the job demand (55).

**Job insecurity:** For many workers, career progression is of overriding importance. By promotion, people not only earn more money but gain increased status and experience new challenges. In the early years at a job, striving and ability required

to deal with a rapidly changing environment are usually rewarded by monetary and promotional rewards. At middle age, however, many people find their career progress slowed or stopped. Job opportunities may become fewer, available jobs can require longer to master, old knowledge may be obsolete, and energy levels can flag while younger competition is threatening. Fear of demotion or obsolescence can be overpowering for those who believe they will suffer some erosion of status before retirement (45)

**Workplace social support:** This type of social support is from both coworkers and supervisors. Socio-emotional support has been expanded by Johnson (33, 56) with the addition as a third dimension of Demand-Control Model. The jobs which are high in demand, low in control and low in social support at work carry the highest risk of chronic disease (30).

Social support on the job has been shown repeatedly to reduce the negative effects of work stressors when they do exist and to sometimes help individuals reduce or eliminate some stressors (e.g., coworker assistance with heavy work demands) (57). The two major categories of social support at work that have been examined are support from peers and from supervisor. Both types may be problematic for minority employees, although little research has been done directly on social support processes and outcomes for minorities (28).

## 2.4 Reviews of relevant research findings

There are many studies conducted to identify the causes of job strain in workplace, which can be separately discussed according to specific factors as follows:

**Age:** There is evidence supported that stress and coping strategies have a directly related to an individual's development and maturity. When an individual grows up, the maturity should increase. They have higher vision and perception life. The ability of solving problem is more clearly and correctly. The thought and action has developed (58). The older individuals have many experiences, with higher seniority, emotional maturity, forward vision, more cautions and more adaptive ability according to situations than those who were young. Several studies showed that

younger were higher stress than the older (32, 43, 53, 59). But different results were found that there were no associated between age and stress (60-61).

**Gender:** Several studies found that female had a higher level of stress than male (62-66). However, there is no statistically association between gender and the job stress (67).

**Education level:** People with higher level of education have better understanding and ability to consider the problems. They can manage the benefit and resources through the stress situations better than the lower educational people. Higher education level of the worker, lower is the chance to have negative mental health (61, 64, 68-69). In contrary, some studies found that workers with bachelor degree or higher had a higher stress than those with lower than bachelor degree level (47).

**Marital status:** marital status was the social network of an individual. It is related to stress. Norbeck (70) found that the family support activates person to manage stress. The spouse can help the other in solving problems. Some studies factors affecting the stress in workplace found single had higher stress than married (60, 71-73). However, some studies found that there were no significant association between marital status and the stress (61, 74-75).

**Income:** Income is also a factor associated with stress. High income individuals and an enough sufficient will be the opportunity to obtain conveniences and social service that were benefit oneself and others than those in lower income (76-77). Then, increased frequency of late night work is a significant correlate of mental health (32), and lower monthly income and being newly employed also increases the risk of poor mental health (49).

**Psychosocial job factors:** The role of person in organization is related to stress. When an individual role is clearly defined and understood and when expectations placed on individual are also clear and no conflicting, stress can be minimum. A few study found that the problem related to the stress of prisoners' behavior control personal at work was an organizational (78). This same finding was proved by study on the relationships between the stress of medical interns and the amount of work (79). Petcharakool (71) also found that the stress was caused by the work itself that could predict the general stress at 33.65 percent.

In conclusion, from literature review, many studies have been conducted to look into the factors related to job strain. These studies have been able to shed insight into the strategies to develop interventions to decrease job strain of the factory workers. Although the real causes of job strain are still not clear, general characteristics factors, lifestyle factors, psychosocial job factors appeared influencing job strain. Consequently, it is interesting to study the prevalence and factors affecting job strain among the workers in an electronic factory.



## **CHAPTER III**

### **MATERIALS AND METHODS**

This chapter describes the research method employed in this study. It includes research design, study area, study population, sample size, sampling method, research instrument, validity and reliability, data collection procedure, data analysis and ethical issues.

#### **3.1 Research design**

This study utilized a cross-sectional study.

#### **3.2 Study area**

This study was conducted at one electronic factory in Navanakorn Industrial Estate Zone 3 Pathumthani Province, Thailand. The company was established in December 1988. The land area was 114,303 square meters (Rai) with the building area of 52,052 square meters. The major products of the company were hard disk drives (HDD) and key components. There were two types of personnel, office and manufacturing.

#### **3.3 Study population**

In the year 2004, the number of workers was about 2,885 people. The study population were all workers aged 18-55 years who have been working in this factory for at least 6 months prior to conduct this study.

### Inclusion criteria

The inclusion criteria were:

1. Workers aged 18-55 years worked in this study area at least 6 months prior to conducting this survey.
2. They were working in the factory during the survey and willing to participate in this study.

### Exclusion criteria

The worker, who was diagnosed as a mental health disorder, was excluded.

### 3.4 Sample size

The estimated sample size was calculated from the following formula (80)

$$n = \frac{Z_{1-\alpha/2}^2 P(1-P) N}{d^2(N-1) + Z_{1-\alpha/2}^2 P(1-P)}$$

Where,  $n$  = The estimated sample size.

$\alpha$  = The level of statistical significance was set at 0.05.

$Z_{1-\alpha/2}$  = The value from normal distribution associated with confidence interval = 1.96 for 95% CI.

$P$  = The proportion of job strain in electronic factory, the value of 0.5 was determined.

$N$  = Population in this study was 2,885 people.

$d$  = The absolute precision required on other side of the proportion of the study, the value of 4.6% was selected.

Then, we calculated sample size when  $Z_{1-\alpha/2} = 1.96$ ,  $P = 0.5$ ,  $N = 2,885$  and  $d = 0.046$

$$\begin{aligned} n &= \frac{(1.96)^2 \times 0.5 \times 0.5 \times 2,885}{[0.046^2 \times (2,885-1)] + [1.96^2 \times 0.5 \times 0.5]} \\ &= 406 \end{aligned}$$

Therefore, 406 subjects were required for this study.

### 3.5 Sampling method

A 2-stage systematic sampling was used to recruit the study subjects.

Stage 1: Selecting groups

1. There were 2 types of personnel, office and manufacturing. Each group was further classified into 3 levels: high-rank manager, mid-level manager and workers.

2. Random the study sample from sub-groups of office and manufacturing sections (Table 1).

Table 1 Total personnel and study samples calculated by proportional to size of each personnel type

Type of personnel	Total	Sample
Office	819	116
High-rank manager	15	15
Mid-level manager	79	10
Workers	725	91
Manufacturing	2,066	292
High-rank manager	5	5
Mid-level manager	19	19
Workers	2,042	266
Total	2,885	406

### 3.6 Research instruments

Questionnaire was composed of 3 parts as follows:

Part I: General characteristics. This part includes gender, age, education level, marital status, number of children, monthly income, job rank, residential, transportations, health status, and work environment.

Part II: Lifestyle factors. This part includes shift work, working hours, number of meals, smoking, alcohol drinking and exercise.

Part III: Psychosocial work characteristics. This part is a 27-items questionnaire modified from Karasek's Job Content Questionnaire.

The content validity of the questionnaire was assessed by all thesis committee. Then, it was pre-tested in one electronic factory in Chonburi province with 30 workers who had similar characteristics to the study sample group. Then items with unclear wording were revised. The revised questionnaire was approved by all thesis committee before collecting data in the studied factory.

### **3.7 Data collection procedure**

Data were collected through the following steps:

1. Coordinated with the factory for cooperated in data collection in area; prepared questionnaire and other for data collection, checked the correctness and status of equipment.
2. Before beginning data collection, all cases were explained the objectives of this study, the content in the questionnaire.
3. Questionnaire was filled up and sends to personnel manager.

### **3.8 Data analysis**

#### **3.8.1 Scoring and classification**

##### **Psychosocial work characteristics**

The job strain measure was derived from Karasek's JCQ 1.7 (revised 1997). The questionnaire included 27 items, which comprise a minimum set of questions for assessing of five scales- job control, psychological job demands, physical job demands, job insecurity, and workplace social support,

The job control (decision latitude) scale is the sum of two sub-scales: skill discretion, measured by six items, and decision authority, measured by three items. The psychological job demands scale is measured by five items. Physical job demands scale is measured by two items and job insecurity scale was measured by three items.

The workplace social support scale is the sum of two sub-scales: support from supervisors and support from coworkers, both measured by four items. For each item, the response was recorded on a five-point Likert's scale, ranging from 1 (strongly disagree), 3 (fair) to 5 (strongly agree). For each scale, a sum of weighted item scores was calculated. A median cut-off point for each scale and sub-scale was used to categorize each variable into "high" and "low". The possible scores and cut-off points for scales and sub-scales of JCQ are shown in Table 2. The calculation formulas are shown in Table 3.

Table 2 Possible scores and cut-off points of Job Content Questionnaire

Scale (No. of items)	Possible score	High <sup>a</sup>	Low <sup>b</sup>
Job control (9)	24 - 120	82 - 120	24 - 81
- Skill discretion (6)	12 - 60	44 - 60	12 - 43
- Decision authority (3)	12 - 60	42 - 60	12 - 41
Psychological job demands (5)	12 - 60	30 - 60	12 - 29
Physical job demands (2)	2 - 10	8 - 10	2 - 7
Job insecurity (3)	5 - 15	8 - 15	5 - 7
Workplace social support (8)	8 - 40	15 - 40	8 - 14
- Supervisor support (4)	4 - 20	15 - 20	4 - 14
- Coworker support (4)	4 - 20	15 - 20	4 - 14

<sup>a</sup>  $\geq$  median      <sup>b</sup>  $<$  median

Table 3 Calculation formulas of Job Content Questionnaire

Scale	Formula
Job control	
- Skill discretion	$[Q1+Q3+Q5+Q7+Q9+(6-Q2)]*2$
- Decision authority	$[Q4+Q8+(6-Q6)]*4$
Psychological job demands	$3*(Q10+Q11)+2*(Q12+Q13+Q14)$
Physical job demands	$Q15+Q16$
Job insecurity	$Q17+(6-Q18)+(6-Q19)$
Workplace social support	
- Supervisor support	$Q20+Q21+Q22+Q23$
- Coworker support	$Q24+Q25+Q26+Q27$

### 3.8.2 Statistical analysis

Descriptive statistics such as frequency, percentage, mean and median were used to describe all studied variables.

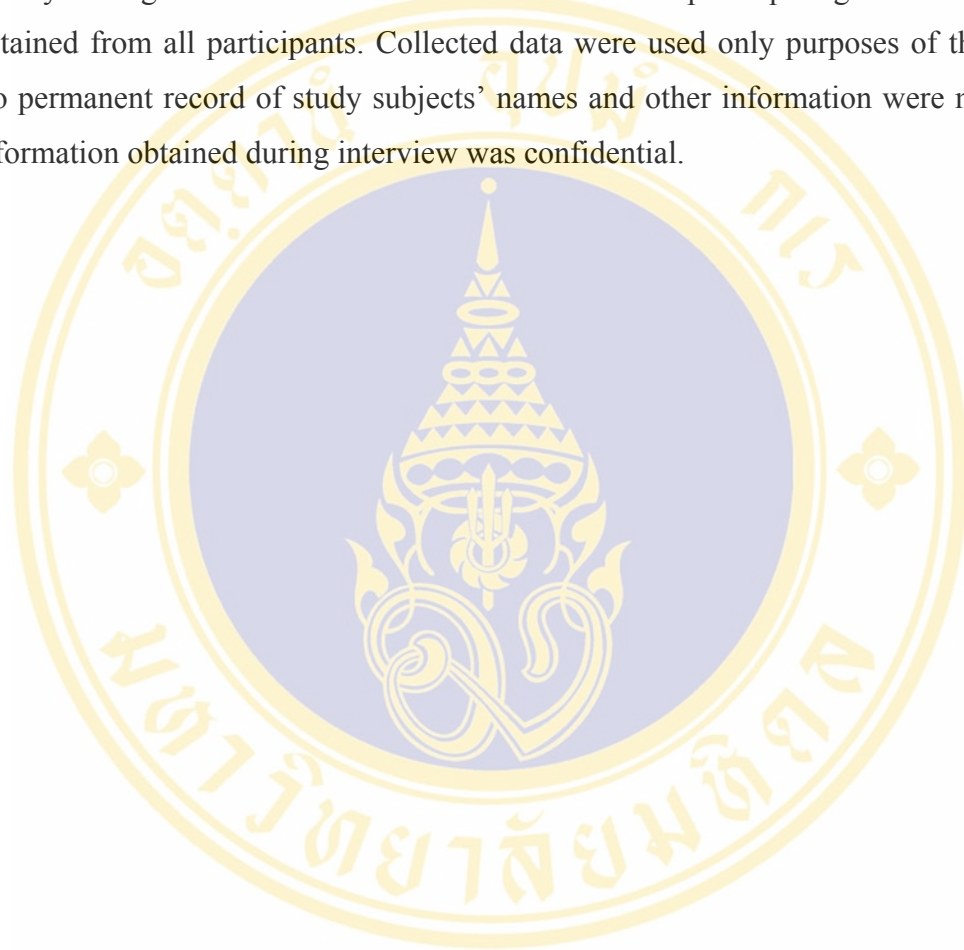
To determine the prevalence of job strain (high psychological job demands and low decision latitude) in the personnel, decision latitude and psychological job demands scores were dichotomized by median cut-off points to obtain high and low values for each scale. Based on the Karasek's model (Chapter 2, Figure 2), a combination of high psychological job demands and high decision latitude was defined as "active", high psychological job demands and low decision latitude was defined as "high strain", low psychological job demands and low decision latitude was defined as "passive" and low psychological job demands and high decision latitude was defined as "low strain".

Pearson's chi-square was used to compare the difference between two proportions. Multiple logistic regression was used to obtain odds ratios and 95% confidence intervals, to determine association between general characteristics, lifestyle factors, psychosocial job factors and job strain. In the analysis, job strain was dichotomized into "high job strain" and "non-high job strain" (81).

The level of statistical significant was set at  $\alpha < 0.05$ .

### 3.9 Ethical issues

The research protocol was reviewed and approved by the Ethical Committee of Mahidol University (see Appendix A). Permission to carry out was obtained from the factory manager of each section. Written consent for participating in the study was obtained from all participants. Collected data were used only purposes of this study. No permanent record of study subjects' names and other information were made. All information obtained during interview was confidential.



## CHAPTER IV

### RESULTS

The studied results are described in the following topics: general characteristics, lifestyle factors, psychosocial job factors and job strain. The last part shows the association between all studied factors and job strain.

#### 4.1 General characteristics of the respondents

Of the 406 respondents, 77.1% were female. The respondent's age ranged from 19 to 44 years with the mean age of 27.7 years. Approximately 57.1% were single. About 68.2% do not have children and 23.6% had one child. Approximately 55.9% completed secondary level education. About half (49.5%) had average monthly income of 5,000 to 10,000 baht. Most of them (87.4%) were workers. The median of average working years was 4.7 years and more than half (51.5%) had average working experience 6 to 10 years. Approximately 59.1% had rental residential. About 20.4% went to work with a private car but most of them traveled by fringe benefits car (70.7%). About 13.8% had chronic diseases, hypertension (8.1%), heart disease (6.5%) and 77.4% had minor illness symptoms such as headache, stomachache. About 19.7% reported that the workplace environment was good environment, while 80.3% reported the workplace environment was need for improvement. Examples of the complaints were: limited working area (47.2%), rather chaotic atmosphere 44.2%, exposure to too cold area (33.4%), loud noise (30.7%), poor ventilation (22.7%) and others environmental problems (7.1%) such as irritate from cigarette smoke and cannot adjust air condition temperature.

Table 4 General characteristics of 406 respondents

Variable	Number	Percent
<b>Gender</b>		
Male	93	22.9
Female	313	77.1
<b>Age (years)</b>		
19-24	107	26.4
25-30	206	50.7
31-36	69	17.0
37-44	24	5.9
Mean = 27.7, SD = 4.8	range 19- 44	
<b>Marital status</b>		
Single	232	57.1
Married	155	38.2
Divorced/ Widowed	19	4.7
<b>Children</b>		
None	277	68.2
1	96	23.6
2	30	7.4
3	3	0.7
<b>Education level</b>		
Primary school	5	1.2
Secondary school	227	55.9
Diploma/Vocation	81	20.0
Bachelor's degree and higher	93	22.9
<b>Average monthly income (baht)</b>		
5,000-10,000	196	48.3
10,001-20,000	147	36.2
>20,000	63	15.5
Median = 11,000	range 5,000-160,000	

Table 4 General characteristics of 406 respondents (continued)

Variable	Number	Percent
<b>Job rank</b>		
High-rank manager	19	4.7
Mid-level manager	32	7.9
Worker	355	87.4
<b>Working experience (years)</b>		
1-5	167	41.1
6-10	209	51.5
>10	30	7.4
Mean = 6.20, SD = 3.60	range 1-17	
<b>Type of residential</b>		
Own house	91	22.4
Rental	240	59.1
Factory accommodation	67	16.5
Own house (on home loan re-payment)	8	2.0
<b>Living with someone</b>		
Alone	125	30.8
Spouse	130	32.0
Family	90	22.2
Friend	61	15.0
<b>Transportations</b>		
Private car	83	20.4
Fringe benefit car	287	70.7
Public transport	32	7.9
Factory accommodation	4	1.0

Table 4 General characteristics of 406 respondents (continued)

Variable	Number	Percent
Having disease(s)		
No	350	86.2
Yes <sup>a</sup>	56	13.8
Hypertension	5	1.2
Heart disease	4	1.0
High cholesterol	2	0.5
Diabetes Mellitus	1	0.2
Hepatitis	1	0.2
Gout	1	0.2
Others minor illness symptoms such as headache, stomachache	48	11.8
Work environment		
Good	80	19.7
Need for improvement <sup>a</sup>	326	80.3
Too limited working space	154	47.2
Chaotic	144	44.2
Too cold	109	33.4
Loud noise	100	30.7
Poor ventilation	74	22.7
Fix level of working chair	48	14.7
Too warm	36	11.0
More vibration	23	7.1
Poor light	21	6.4
Too high chemicals	15	4.6
Too low level of working table	11	3.4
Too quiet	10	3.1
Others	23	7.1

<sup>a</sup> multiple responses

## 4.2 Lifestyle factors

Table 5 reveals that 77.3% had a shiftwork, 47.3% had 11-12 working hours a day and 4.2% worked more than 12 hours a day. About 14.5% had normal working hours.

Approximately 25.7% said that they always had 3 meals a day. Meanwhile 34.5% reported that they seldom had 3 meals a day. Most respondents were non-smokers (91.1%) and non-drinkers (65.8%). About 60% are not doing physical exercise. Only 9.6% said that they were doing exercise  $\geq 3$  times/ week and at least 30 minutes each time.

Table 5 Lifestyles of 406 respondents

Variable	Number	Percent
<b>Shiftwork</b>		
No	92	22.7
Yes	314	77.3
<b>Working hours (hrs/day)</b>		
<6	2	0.5
7-8	59	14.5
9-10	136	33.5
11-12	192	47.3
>12	17	4.2
<b>Taking 3 meals/day</b>		
Always	105	25.9
Sometimes	161	39.7
Seldom	140	34.5
<b>Smoking</b>		
Non smoker	370	91.1
Former smoker	13	3.2
Current smoker	23	5.7

Table 5 Lifestyles of 406 respondents (continued)

Variable	Number	Percent
Alcohol drinking		
Non drinker	267	65.8
Former drinker	21	5.2
Current drinker	118	29.1
Exercise (30 mins/ time)		
No	242	59.6
1-2 times/ week	125	30.8
≥3 times/ week	39	9.6

### 4.3 Psychosocial job factors

The proportion of high physical job demands was 55.9% and high job insecurity was 59.9%. About 52% of workers had high workplace social support. The proportion of high coworker support was higher than supervisor support (63.8% vs. 53.4%).

Table 6 Proportions of 'high and low' scores of variables under psychosocial job factors of 406 respondents

Variable	Number	Percent
Physical job demands		
Low	179	44.1
High	227	55.9
Job insecurity		
Low	163	40.1
High	243	59.9

Table 6 Level of psychosocial job factors of 406 respondents (continued)

Variable	Number	Percent
Workplace social support		
Low	197	48.5
High	209	51.5
Supervisor support		
Low	189	46.6
High	217	53.4
Coworker support		
Low	147	36.2
High	259	63.8

#### 4.4 Prevalence of job strain

Overall, the prevalence of high job strain was 23.6%, while low strain was 25.6% (Table 7). A significantly higher proportion of workers reported high job strain as compared to high/mid-level manager (26.2% vs. 5.9%) as shown in Table 8.

Table 7 Prevalence of job strain among 406 respondents

Variable	Number	Percent
High strain	96	23.6
Non-high strain	310	76.4
Low strain	104	25.6
Active job	112	27.6
Passive job	94	23.2
Total	406	100.0

Table 8 Prevalence of job strain by job rank among 406 respondents

Variable	Number	High/mid-level manager		Workers		P-value
		n	%	n	%	
		High strain	96	3	5.9	
Non-high strain	310	48	94.1	262	73.8	
Total	406	51	100.0	355	100.0	

#### 4.5 Association between general characteristics, lifestyle factors, psychosocial job factors and job strain

##### 4.5.1 General characteristics

General characteristics included gender, age, education level marital status, monthly income, number of children, job rank, and work environment. Three variables under general characteristics were significantly associated with job strain (Table 9).

Respondents who aged  $\leq 30$  years were 2.22 times more likely to develop high job strain than aged  $> 30$  years. (OR = 2.22, 95%CI 1.17-4.20).

Lower education level respondents were more times like to develop high job strain than those with higher education level. Primary/secondary school respondents were 4.14 times and diploma/vocational were 4.21 times more likely to develop high job strain than those with bachelor's degree or higher (OR = 4.14, 95%CI 1.90-9.02 for primary/ secondary school vs. bachelor's degree or higher; OR = 4.21, 95%CI 1.76-10.07 for diploma/vocational vs. bachelor's degree or higher).

Lower job rank workers were 5.68 times more likely to develop high job strain than higher job rank (OR = 5.68, 95%CI 1.73-18.67).

Other seven variables, i.e., gender, marital status, average monthly income 10,001-20,000, number of children, work environment, limited working space and chaotic working area were not statistically associated with job strain.

Table 9 Prevalence and crude odds ratios (ORs) of job strain level by general characteristics of 406 respondents

Variable	Types of job strain			OR	95%CI	P-value
	Total	High	Non-high <sup>a</sup>			
		%	%			
<b>Gender</b>						
Male	93	17.2	82.8	1.00		
Female	313	25.6	74.4	1.65	0.91-3.00	0.098
<b>Age (years)</b>						
>30	93	14.0	86.0	1.00		
≤30	313	26.5	73.5	2.22	1.17-4.20	0.012
<b>Education level</b>						
Bachelor's degree and higher	93	8.6	91.4	1.00		
Diploma/vocational	81	28.4	71.6	4.21	1.76-10.07	0.001
Primary/secondary school	232	28.0	72.0	4.14	1.90-9.02	<0.001
<b>Marital status</b>						
Divorced/ Widowed	19	21.1	78.9	1.00		
Married	155	24.5	75.5	1.22	0.38-3.90	0.739
Single	232	23.3	76.7	1.14	0.04-3.57	0.825
<b>Average monthly income (baht)</b>						
5,000-10,000	196	26.5	73.5	1.00		
10,001-20,000	147	27.9	72.1	1.07	0.66-1.73	0.779
>20,000	63	4.8	95.2	0.14	0.40-0.46	0.001
<b>Number of children</b>						
No	276	24.3	75.7	1.00		
1	97	19.6	80.4	0.76	0.43-1.35	0.347
>1	33	30.3	69.7	1.36	0.61-2.99	0.451

<sup>a</sup> Three other job strain categories: low strain, active job and passive job.

Table 9 Prevalence and crude odds ratios (ORs) of job strain level by general characteristics of 406 respondents (continued)

Variable	Types of job strain			OR	95%CI	P-value
	Total	High	Non-high <sup>a</sup>			
		%	%			
<b>Job rank</b>						
High/ mid-level manager	51	5.9	94.1	1.00		
Worker	355	26.2	73.8	5.68	1.73-18.67	0.004
<b>Work environment</b>						
Good	80	22.5	77.5	1.00		
Need for improvement	326	23.9	76.1	1.08	0.61-1.94	0.788
<b>Limited working space</b>						
No	252	21.4	78.6	1.00		
Yes	154	27.3	72.7	1.38	0.87-2.19	0.180
<b>Chaotic working area</b>						
Yes	144	22.9	77.1	1.00		
No	262	24.0	76.0	1.07	0.66-1.72	0.798

<sup>a</sup> Three other job strain categories: low strain, active job and passive job.

#### 4.5.2 Lifestyle factors

Lifestyle factors included shiftwork, working hours, frequent of meals, smoking, alcohol drinking and exercise. One variable was associated with job strain (Table 10).

Respondents who worked shiftwork were 4.80 times more likely to develop high job strain than others (OR = 4.80, 95%CI 2.14-10.78).

Other five variables under lifestyle factors, i.e., working hours, number of meals, smoking, alcohol drinking and physical exercise were not statistically associated with job strain.

Table 10 Prevalence and crude odds ratios (ORs) of job strain level by lifestyle factors of 406 respondents

Variable	Types of job strain			OR	95%CI	P-value
	Total	High	Non-high <sup>a</sup>			
		%	%			
<b>Shiftwork</b>						
No	92	7.6	92.4	1.00		
Yes	314	28.3	71.7	4.80	2.14-10.78	<0.001
<b>Working hours (hrs.)</b>						
≤8	61	14.8	85.2	1.00		
>8	345	25.2	74.8	1.95	0.92-4.12	0.081
<b>3 meals a day</b>						
Yes	140	20.7	79.3	1.00		
No	266	25.2	74.8	1.29	0.79-2.11	0.314
<b>Smoking</b>						
Yes	23	21.7	78.3	1.00		
No	383	23.8	76.2	1.12	0.41-3.11	0.825
<b>Alcohol drinking</b>						
Yes	118	22.9	77.1	1.00		
No	288	24.0	76.0	1.06	0.64-1.77	0.817
<b>Exercise (30 mins/time)</b>						
≥ 3 times/ week	39	15.4	84.6	1.00		
1-2 times/ week	125	24.0	76.0	1.74	0.66-4.54	0.261
No	242	24.8	75.2	1.81	0.72-4.54	0.204

<sup>a</sup> Three other job strain categories: low strain, active job and passive job.

### 4.5.3 Psychosocial job factors

Psychosocial job factors included physical job demands, job insecurity, workplace social support, supervisor support, and coworker support. Three variables under psychosocial job factors were associated with job strain (Table 11).

Respondents who had high physical demands were 4.32 times more likely to develop high job strain than others (OR = 4.32, 95%CI 2.50-7.49).

Workers who reported low workplace social support were 1.78 times more likely to develop high job strain than others (OR = 1.78, 95%CI 1.12-2.82).

Lower supervisor support workers were 2.48 times more likely to develop high job strain than those who had high supervisor support (OR = 2.48, 95%CI 1.54-3.98).

Job insecurity and coworker support were not statistically associated with job strain.

Table 11 Prevalence and crude odds ratios (ORs) of job strain level by psychosocial job factors of 406 respondents

Variable	Total	Types of job strain		OR	95%CI	P-value
		High	Non-high <sup>a</sup>			
		%	%			
Physical job demands						
Low	179	10.6	89.4	1.00		
High	227	33.9	66.1	4.32	2.50-7.49	<0.001
Job insecurity						
High	243	22.2	77.8	1.00		
Low	163	25.8	74.2	1.22	0.76-1.93	0.410
Workplace social support						
High	209	18.7	81.3	1.00		
Low	197	28.9	71.1	1.78	1.12-2.82	0.016

<sup>a</sup> Three other job strain categories: low strain, active job and passive job.

Table 11 Prevalence and crude odds ratios (ORs) of job strain level by psychosocial job factors of 406 respondents (continued)

Variable	Types of job strain			OR	95%CI	P-value
	Total	High	Non-high <sup>a</sup>			
		%	%			
<b>Supervisor support</b>						
High	217	16.1	83.9	1.00		
Low	189	32.3	67.7	2.48	1.54-3.98	<0.001
<b>Coworker support</b>						
High	259	22.4	77.6	1.00		
Low	147	25.9	74.1	1.21	0.75-1.84	0.431

<sup>a</sup> Three other job strain categories: low strain, active job and passive job.

#### 4.6 Multiple logistic regression analysis of lifestyle factors, psychosocial job factors and job strain

To adjust for all other variables in the model, 18 variables were simultaneously analyzed by multiple logistic regression. This set of variables comprised eight variables under general characteristics (gender, age, education level, marital status, monthly income, number of children, job rank, and work environment), six variables under lifestyle factors (shiftwork, working hours, number of meal, smoking, alcohol drinking, and exercise), four variables under psychosocial job factors (physical job demands, job insecurity, supervisor support, and coworker support). Table 11 reveals that two variables under psychosocial job factors were significantly associated with job strain: low physical demands (adjusted OR = 4.32, 95%CI 2.26-8.26) and low supervisor support (adjusted OR = 3.09, 95%CI 1.75-5.49)

Table 12 Multiple logistic regression analysis of general characteristics, lifestyle factors, psychosocial job factors and job strain (n=406)

Variable	Unadjusted		Adjusted <sup>a</sup>		P-value
	OR	95%CI	OR	95%CI	
Physical job demands					<0.001
Low	1.00		1.00		
High	4.32	2.50-7.49	4.32	2.26-8.26	
Supervisor support					<0.001
High	1.00		1.00		
Low	2.48	1.54-3.98	3.09	1.75-5.49	

<sup>a</sup> adjusted for all other variables in the model.

## CHAPTER V

### DISCUSSION

Job strain is becoming an essential leading cause to increase individuals' risk for diseases. In Thailand job strain is one of occupational health problem, increased in numbers and a significant cause of economic loss. This chapter presents the discussion of research findings and compares the results with previous studies.

#### 5.1 Prevalence of job strain

Job strain has become a major concern in recent years because of its potential impacts on both worker well-being and performance. There are several studies investigating the prevalence and factors affecting job strain. This study compares the results with previous studies on similar population groups, using the similar research tool. In present study, the prevalence of job strain among workers was 23.6%. The result was almost the same figure 23.0% of Souza, et al.(82), 23.3% of Huda, et al. (83) and 24.3% of Snongdech (84). The proportion of high strain was quite lower than the finding 33.3% of Aziah, et al. (85) and 40.7% of Higashigushi, et al. (86). The different findings might be due to that job strain is complex and rather subjective. Job Content Questionnaire (JCQ) is a tool for subjective assessment of work characteristics rather than objective assessment. Job strain in this study was assessed through the perceptions of the participated workers. In addition, there are many factors affecting job strain. Job strain of individual worker varies according to time period. Therefore, the measurement of the workers' job strain in different time period resulted in different level of job strain.

The proportion of high job strain among workers in this study was quite higher than the high/mid-level manager group (26.2 % vs. 5.9%). The possible reason to explain was that the average income of the workers group was quite low. To earn

more income, the workers have to work overtime, do shiftwork or other hard work that increased their job strain (89).

## 5.2 Factor affecting job strain among workers in an electronic factory

Univariate analysis revealed that five variables were statistically associated with job strain: worker's age, education level, job rank, shiftwork, physical job demands, and supervisor support. Multiple logistic regression analysis indicated that after adjusting for all other variables in the model. Two variables were statistically associated with job strain: high physical job demands (adjusted OR = 4.32, 95%CI 2.26-8.26) and low supervisor support (adjusted OR = 3.09, 95%CI 1.75-5.49).

The findings revealed that the workers with high physical job demands were 4.32 times more likely to develop job strain as compared to low physical job demands. Three possible explanations can explain these: Firstly, the studied factory produces computer hard disc and key components. During working hours workers are not allowed to talk, stretch or look around until the break time (16); Secondly, the job also required the workers to do things very quickly, hard working, rapid physical activity and high concentration in order to deliver quality products on time. The workers are under great pressure not to make mistake and to achieve production quotas, which are set by the day or by the hour (16); Lastly, these groups of workers also have a lower education and income as compared to low physical job demands. They also have low level of decision making about their works. With high physical job demands and low job control, this caused them having high job strain. The results confirmed the Karasek's job demand-control model (5, 9). Aziah BD, et al. (85) reported that laboratory technicians in Hospital Universiti Sains Malaysia (HUSM) with high physical exertion were 1.7 times more likely to develop job strain than low physical exertion. Carayon, et al. (87) found that primary factors affecting worker strain among a sample of office workers employed by a public service organization were job demands, job content and social support from supervisors and coworkers.

The study also showed that supervisor support was statistically associated with job strain among workers in the studied factory. The workers with low social support from supervisors were 3.09 times more likely to develop job strain as compared to

high supervisor support. Two possible explanations can explain these: 1) the major role of the supervisor was to supervise and support the workers. If the supervisor is not a good leader or cannot provide proper support to the workers, this may lead to conflict among supervisors and workers in the organization; 2) supervisor with a rather rigid and criticism personality may cause some workers live in fear of criticism and penalties at work. Social support also modified the relationship between the levels of psychosocial well-being and job strain. Park and Gilson (88) conducted a survey with male factory workers at four manufacturing companies producing household appliances in Puchon, Korea. Results revealed that 'relationships at work' was the most prominent work factor contributing to factory workers' psychological strain among the psychological work environment factors. A supportive social environment at work had an important role in reducing or buffering workers' psychological strain. Park and Lee (89) reported a strong association between relationships at work and psychological strain among Korean factory workers. Kline and Snow (90) insisted that supervisor support and coworker support had direct effects on decreasing perceived work stressors and psychological strain in a stress intervention study for working mothers. Sargent and Terry (91) carried out a study with 135 full-time clerical employees working in a university, Australia. The findings showed that the high levels of supervisor support mitigated against the negative effects of high strain jobs.

Multiple logistic regression analysis revealed that after controlling for all other variables in the model, workers' age, education level, job rank and shiftwork were not significantly associated with job strain. Since these factors were inter-related to each other. Most young workers had low education level, low job rank. They have to do shiftwork to earn more money. In addition, most jobs of low education workers were also required high physical job demands with low job control. They have to work under great pressure not to make mistakes and to achieve production quotas. If they fail to do so, they will feel in fear of criticism from the supervisors.

Lack of control over work, the workplace and low supervisor support have been identified both as stress and as a critical health risk for some workers (92). Workers who are unable to control over their life at work are more likely to experience job strain. Relationships at work had a marked effect on job strain. Workers who had low supervisors support are more likely to report high job strain.

## Limitations

1. The study participants came from a range of social class. This study investigated the effects of perceived work environment and psychological job characteristics measured at one time-point. In addition, the answers were relied on self-reports. Therefore, there is room for misclassification of the exposure variables.

2. In this Thai version of Karasek's JCQ, the response of each item was recorded on a five-point Likert's scale ranging from 1(strongly disagree), 3(fair) to 5(strongly agree) whereas the Karasek's JCQ version 1.7 (revised 1997) has four responses in each item (no 'fair' response). This may affect the prevalence of the studied subjects in some degrees.

2. The cross-sectional study design means that the ability to make causal inferences from the results is limited.

3. The job demand-control model focused on job stress caused by psychosocial job characteristics. Accordingly, some job stressors were not included in this study questionnaire such as personality, organizational factors and non-job factors (home environment, social support from family, marriage relation).

4. The small sample size had large variance than the reference population. Therefore, prevalence of job strain in this study cannot be generalized beyond all electronic factories in Thailand.

## CHAPTER VI

### CONCLUSION AND RECOMMENDATIONS

This cross-sectional study aimed to measure the prevalence and determine the association between general characteristics, lifestyle factors, psychosocial job factors and job strain. The study population was workers in one electronic factory in Navanakorn Industrial Estate Zone 3, Pathum Thani Province, Thailand from October to December, 2004. Four hundred and six workers completed the Thai version of Karasek's Job Content Questionnaire.

The content validity of the questionnaire was assessed by all thesis committee. Then, it was first pre-tested with 30 workers in an electronic factory in Chonburi Province. Cronbach's Alpha Coefficient was used to assess the reliability of the psychosocial work characteristic part in worker's perceptions of job strain parts. All items were reviewed by all advisors before using in the field.

#### **Conclusion**

Of the 406 respondents, 77.1% were female. Age ranged from 19 to 44 years with the mean age of 27.7 years. Approximately 57.1% were single. About 68.2% did not have children and 23.6% had one child. Approximately 55.9% completed secondary school. About half (49.5%) had average monthly income of 5,000 to 10,000 baht. Most of them (87.4%) were workers. The mean of the working years was  $6.2 \pm (3.6)$  years. 51.5% had average working experience of 6 to 10 years. Approximately 59.1% had rental residential. About 20.4% went to work with a private car while 70.7% traveled by welfare car. About 13.8% had chronic diseases, such as hypertension (8.1%), heart disease (6.5%). 77.4% had minor illness symptoms such as headache, stomachache. About 80.3% of the workers reported the workplace

environment was need for improvement. Examples of the complaints were: limited working area (47.2%), rather chaotic atmosphere 44.2%, exposure to too cold area (33.4%), loud noise (30.7%), poor ventilation (22.7%) and others environmental problems (7.1%) such as irritate from cigarette smoke and cannot adjust air condition temperature.

About 77.3% had a shiftwork, 47.3% reported 11-12 working hours a day and 4.2% worked more than 12 hours a day. About 14.5% had normal working hours. Approximately 25.7% said that they always had 3 meals a day. Meanwhile 34.5% reported that they seldom had 3 meals a day. Most respondents were non-smokers (91.1%) and non-drinkers (65.8%). About 60% are not doing physical exercise. Only 9.6% said that they were doing exercise  $\geq 3$  times/ week and at least 30 minutes each time.

The proportion of high physical job demands was 55.9% and high job insecurity was 59.9%. About 52% of workers had high workplace social support. The proportion of high coworker support was higher than supervisor support (63.8% vs. 53.4%).

Overall, the prevalence of high job strain was 23.6% (Table 7). A significantly higher proportion of workers reported high job strain as compared to high/mid-level managers (26.2% vs. 5.9%).

Univariate analysis showed that three variables under general characteristics were statistically associated with high job strain: workers aged  $\leq 30$  years (OR = 2.22, 95%CI 1.17-4.20), lower education level: Primary/secondary school and diploma/vocational workers (OR = 4.14, 95%CI 1.90-9.02 for primary/ secondary school vs. bachelor's degree or higher; OR = 4.21, 95%CI 1.76-10.07 for diploma/vocational vs. bachelor's degree or higher), lower job rank workers (OR = 5.68, 95%CI 1.73-18.67) and one variable under lifestyle factors: shiftwork (OR = 4.80, 95%CI 2.14-10.78).

Two variables under psychosocial job factors were statistically associated with high job strain: high physical job demands (OR = 4.32, 95%CI 2.50-7.49), and low supervisor support workers (OR = 2.48, 95%CI 1.54-3.98).

Multivariate analysis. Multiple logistic regression analysis revealed that after controlling for all other variables in the model two variables under psychosocial job factors were significantly associated with job strain: low physical demands (adjusted

OR = 4.32, 95%CI 2.26-8.26) and low supervisor support (adjusted OR = 3.09, 95%CI 1.75-5.49)

## Recommendations

Based on the findings of this study, the following issues should be considered in decreasing factory workers job strain.

1. Approximately 23.6% of respondents had high job strain. The factory should formulate plan to decrease job strain of the factory workers. Since job strain is an essential leading cause to increase risk of diseases, such as occurrence of occupational injuries, working mistake, and incidence of sick leave. In contrary, decreasing job strain could increase the efficiency of workers, the quality of work and good health.

2. About 22.2% of the workers reported high job insecurity. The factory administrators should aware of this aspect. Since high job insecurity has negative effects on business and harms health, even more than unemployment. Previous study revealed that the higher the level of job security, the better the level of productivity (92). Personnel with security jobs are better coping with stressful working environment and life events.

3. About 48.5% of the workers received low workplace social support. Since increasing of workplace social support both supervisor and coworker support can reduce job strain. Thus, workplace health promotion strategies for workers with high job strain should be focused on increasing workplace social support by increasing good relations between workers and supervisors.

4. Approximately 77.3% of the workers have to do shiftwork and 47.3% have to work 11-12 working hours a day. Doing shiftwork could increase job strain. The appropriate numbers and time spacing of shiftwork should be arranged for individual workers.

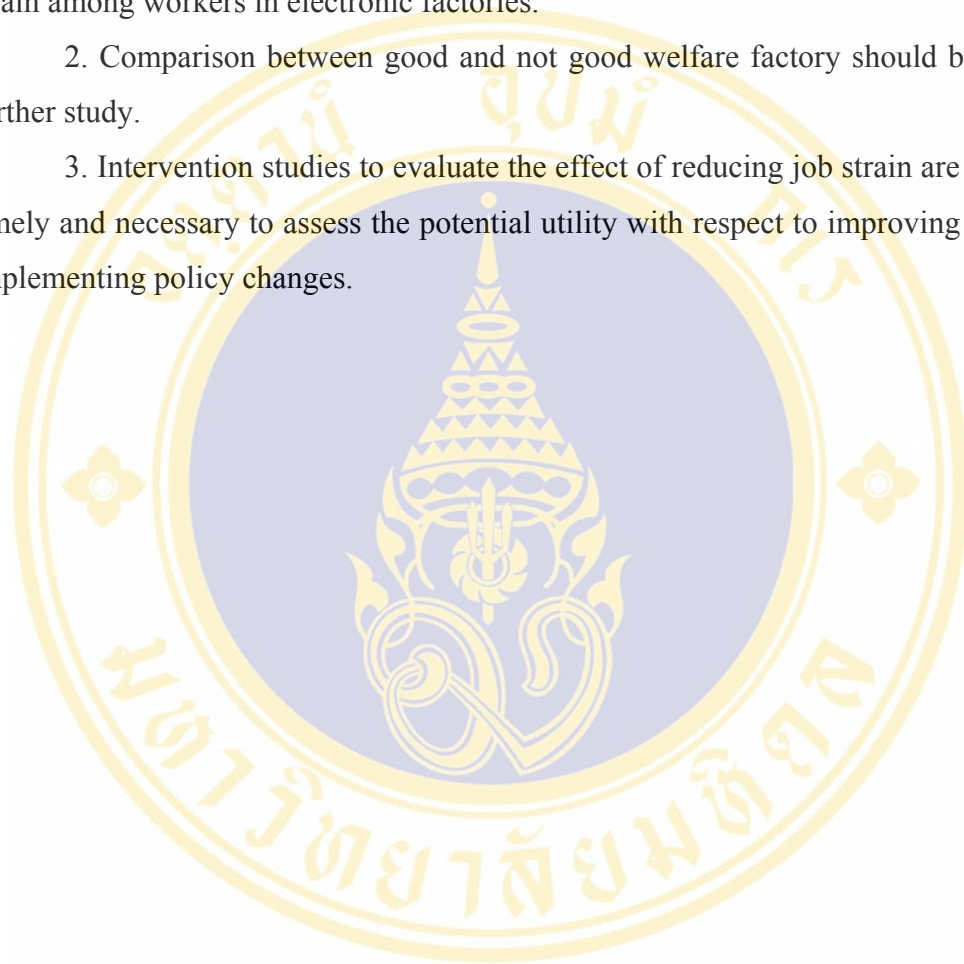
5. Recreation room with light music, reading corner, physical exercise or other recreation activities should also provided.

### **Recommendations for further study**

1. Further study should be carried out with more representative sample size and settings. Prospective studies should be conducted to find out the risk factors of job strain among workers in electronic factories.

2. Comparison between good and not good welfare factory should be used in further study.

3. Intervention studies to evaluate the effect of reducing job strain are therefore timely and necessary to assess the potential utility with respect to improving health of implementing policy changes.



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## **APPENDIX B**

### **INFORMATION SHEET**

**Project Title:** Prevalence and factors affecting job strain among workers in an electronic factory

#### **Objectives**

1. To measure the prevalence of job strain among workers aged 18-55 years in one electronic factory.
2. To assess the general characteristics i.e. gender, age, education level, marital status, monthly income, number of children, job rank, and work environment among workers aged 18-55 years in one electronic factory.
3. To assess the lifestyle factors i.e. shiftwork, working hours, number of meals, smoking, alcohol drinking, and exercise among workers aged 18-55 years in one electronic factory.
4. To assess the psychosocial job factors i.e. physical demands, job insecurity, workplace social support from coworkers and supervisors among workers aged 18-55 years in one electronic factory.
5. To identify the relationship between general characteristics, lifestyle factors, psychosocial job factors and job strain among workers aged 18-55 years in one electronic factory.

#### **Benefit of the study**

This study will provide baseline data concerning the prevalence and risk factors of job strain of an electronic factory. This information will be used to identify intervention to decrease job stress and job strain in the workplace.

## Research methods

This study is an analytical cross-sectional study. The study populations are workers in an electronic factory in Navanakorn Industrial Estate Zone 3 Pathum Thani Province, Thailand. Two-stage systematic sampling technique will be used to recruit 406 subjects. Inclusion criteria are workers aged 18-55 years; work in the study factory for at least 6 months prior to conducting this survey; working in the factory during the survey and willing to participate in this study. Exclusion criteria are workers who were diagnosed as a mental health disorder.

## Research instrument

You will take about 20 minutes to fill up the questionnaire, which consists of three parts as follows:

Part I: General characteristics

Part II: Lifestyle factors

Part III: Psychosocial job characteristics

Answer the questions based on what you are really do or felling. **You can refuse to answer any question you do not want to answer without any obligation.**

## Ethical considerations

The research protocol was approved by an ethical committee, no identifying information will be taken (such as name); individual questionnaire results will be kept completely confidential to the researcher. Individual questionnaires will be destroyed and all results will be grouped together for analysis by the researcher. Consent to participate is voluntary.

\*\*\*\*\*

## APPENDIX C

### INFORMED CONSENT FORM

**Project Title:** Prevalence and factors affecting of job strain among workers in an electronic factory

**Investigator:** Mr.Jirachai Jirachewee    Address: 219/11 Dermbang Road, Muang District, Samut Sakhon Province 74000 Tel. 06-7559060

Date of consent: ..... (day/ month/ year)

I have read and understood all statements in the consent form. I also have been given explanation regarding the objectives and methodology of the study, possible risk and benefit that may occur to me upon the participation in the study.

I understand that:

1. The purposes of the survey are to measure the prevalence of job strain in an electronic factory. Furthermore, to identify the association between general characteristics, lifestyle factors, psychosocial job factors and job strain;
2. The results of the survey will be useful to identify intervention for decreasing job strain in the factory;
3. The survey will take about 20 minutes to complete;
4. No identifying information will be taken (such as name); individual questionnaire results will be kept completely confidential to the researcher;
5. Individual questionnaires will be destroyed and all results will be grouped together for analysis by the researcher;
6. My consent to participate is voluntary. I can stop the answer the questions at any time and I do not have to give a reason for the withdrawal of my consent.

I have read this consent sheet and all my questions had answered to my satisfaction.

Signature ..... (Respondent/ informant)  
(Mr./Mrs./Ms .....)

Signature ..... (Witness)  
(Mr./Mrs./Ms .....)

Signature ..... (Witness)  
(Mr./Mrs./Ms .....)

I cannot read but before signing my consent hereby, the investigator had read and explained me about the study, the details in information sheet and informed consent form. In addition, all my questions had answered to my satisfaction.

Signature ..... (Respondent/ informant)  
(Mr./Mrs./Ms .....)

Signature ..... (Witness)  
(Mr./Mrs./Ms .....)

Signature ..... (Witness)  
(Mr./Mrs./Ms .....)

## APPENDIX D

### QUESTIONNAIRE

Prevalence and factors affecting job strain among workers in an electronic factory.

#### **Instruction**

1. This questionnaire consists of 3 parts as follows:
  - 1.1 General characteristics
  - 1.2 Lifestyle factors
  - 1.3 Psychosocial work characteristics
2. The questionnaire does not include good or bad answers. You are requested to provide truthful information in the questionnaire.

\*\*\*\*\*

ID .....

**Part I. General characteristics**

1. Gender      1 Male      2 Female
2. Age ..... years
3. Education level  
     1 Primary school    2 Secondary school    3 High school  
     4 Diploma school    5 Vocational school    6 Bachelor's degree  
     7 Higher bachelor's degree
4. Marital status  
     1 Single    2 Married    3 Divorced    4 Widowed
5. Do you have children?  
     1 No            2 Yes (number) .....
6. Job experience in this factory..... years
7. Current job position .....
8. Average monthly income ..... baht
9. Type of residential  
     1 Own house            2 Rental  
     3 Factory accommodation    4 Own house (on home loan payment)
10. Are you living with someone?  
     1 Alone    2 Spouse    3 Family    4 Friend
11. How do you go to your workplace?  
     1 Private car                    2 Welfare car  
     3 Public transport            4 Factory accommodation
12. Do you have any chronic disease(s)? (multiple response)  
     1 No  
     2 Hypertension                    3 Heart disease  
     4 Diabetes Mellitus            5 Cancer  
     6 Hepatitis                    7 Renal disease  
     8 High cholesterol            9 Gout  
     10 Others .....

13. What are your perceptions on your workplace environment? (multiple response)

- 1 Good conditions
- 2 Too warm  3 Too cold
- 4 Loud noise  5 Too quiet
- 6 Poor ventilation  7 More vibration working area
- 8 Poor light  9 Too limited working space
- 10 Too low level of working table  11 Fix level of working chair
- 12 Too high chemicals  13 Chaotic working area
- 14 Others .....

\*\*\*\*\*

**Part II. Lifestyle factors**

1. During the past 3 months, do you have any shiftwork?

- 1 No  2 Yes

2. During the past 3 months, how many you're working hours?

- 1 Less than 6 hours  2 7-8 hours  3 9-10 hours
- 4 11-12 hours  5 More than 12 hours

3. During the past 3 months, how many times do you have 3 meals a day?

- 1 Seldom  2 Sometimes  3 Always

4. Do you smoke cigarettes?

- 1 No  2 Former smokers, quit smoking for ..... (months/ years)
- 3 Current smoker, on average, you smoke..... cigarettes/ day.

5. Are you drinking alcohol beverage?

- 1 No  2 Former drinkers, quit drinking for ..... (months/ years)
- 3 Current drinker, on average, you drink .....day(s)/ week

6. During the past 1 month, do you exercise (at least 30 minutes/ time)?

- 1 No
- 2 one time/ week
- 3 two times/ week
- 4 ≥three times/ week

**Part III. Psychosocial work characteristics****Instruction:** Please tick (√) the item which you think is close to your perception.

Item	Strongly disagree	Disagree	Fair	Agree	Strongly agree
1. My work requires me to learn new things.					
2. There are a lot of repetitive tasks in my work.					
3. My work requires me to be creative.					
4. My work allows me to make my own decision.					
5. My work requires a high level of skills.					
6. On my work, I have very little freedom to decide how I do my work					
7. I can do a variety of different things on my job.					
8. On things that happen at work, my opinions are influential.					
9. My work provides room for me to develop my own talent.					
10. My work requires me to do things very quickly.					
11. My work requires me to be very hard working.					
12. My workload is not considered excessive.					
13. I have enough time to accomplish my work.					
14. On my job, I am not asked by different people to do things that are contradictory.					
15. My work requires rapid physical activity					
16. My work make awkward body position					

Item	Strongly disagree	Disagree	Fair	Agree	Strongly agree
17. My work is a steady work.					
18. My work is a security work.					
19. In the future, I am likely to be layoff.					
20. My supervisor gives concerns to staff's welfare.					
21. My supervisor listens to my opinions.					
22. My supervisor provides assistance to staff.					
23. My supervisor organizes well the staff members as to facilitate tasks at work.					
24. My coworkers attend their duties well.					
25. My coworkers show their care for me.					
26. My coworkers are friendly.					
27. My coworkers are helpful.					

## APPENDIX E

แบบสอบถามเลขที่ .....

### แบบสอบถาม

เรื่อง ความชุกและปัจจัยที่มีผลต่อความล้าของพนักงานในโรงงานอิเล็กทรอนิกส์

#### คำชี้แจง

แบบสอบถามชุดนี้ มีวัตถุประสงค์เพื่อศึกษาความชุกและปัจจัยที่มีผลต่อความล้าจากการทำงาน ได้แก่ สิ่งแวดล้อมทางจิตสังคม หรือบรรยากาศในการทำงานและวิถีชีวิตที่มีผลให้เกิดความเครียดและความล้าจากการทำงาน ทั้งนี้หากปัจจัยเหล่านี้ได้รับการแก้ไข จะช่วยลดความเครียดและความล้าจากการทำงาน ตลอดจนลดความเสี่ยงต่อการเกิดโรคหัวใจ โรคความดันโลหิตสูง และการบาดเจ็บจากการทำงาน

ขอให้ท่านตอบคำถามแต่ละข้อตามความเป็นจริง ทุกคำถามไม่มีคำตอบข้อใดที่ถูกหรือผิด การตอบแบบสอบถามชุดนี้ไม่ต้องระบุชื่อของผู้ตอบ ท่านจึงแน่ใจได้ว่าจะไม่มีการเชื่อมโยงผลการศึกษาที่ก่อให้เกิดผลกระทบที่ไม่ดีต่อตัวท่าน ข้อมูลที่ได้จะถูกวิเคราะห์ในภาพรวม และนำไปใช้เพื่อการวิจัยเท่านั้น

แบบสอบถามประกอบด้วยข้อมูลทั้งหมด 3 ส่วน คือ

- |           |                    |
|-----------|--------------------|
| ส่วนที่ 1 | ข้อมูลทั่วไป       |
| ส่วนที่ 2 | วิถีชีวิต          |
| ส่วนที่ 3 | บรรยากาศในการทำงาน |

**ส่วนที่ 1 ข้อมูลทั่วไป**

1. เพศ  1 ชาย  2 หญิง
2. อายุ ..... ปี
3. วุฒิกการศึกษา
 

<input type="checkbox"/> 1 ประถมศึกษา	<input type="checkbox"/> 2 มัธยมต้น	<input type="checkbox"/> 3 มัธยมปลาย
<input type="checkbox"/> 4 ปวช.	<input type="checkbox"/> 5 ปวส.	<input type="checkbox"/> 6 ปริญญาตรี
<input type="checkbox"/> 7 สูงกว่าปริญญาตรี		
4. สถานภาพสมรส
 

<input type="checkbox"/> 1 โสด	<input type="checkbox"/> 2 คู่
<input type="checkbox"/> 3 หย่า/แยก	<input type="checkbox"/> 4 หม้าย(คู่เสียชีวิต)
5. ท่านมีบุตรหรือไม่
 

<input type="checkbox"/> 1 ไม่มี	<input type="checkbox"/> 2 มี ..... คน (ต้องรับผิดชอบด้านการเงินหรือเลี้ยงดู ..... คน)
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6. ท่านทำงานที่นี้มาแล้ว ..... ปี
7. ปัจจุบันท่านทำงานอยู่ในตำแหน่ง .....
8. ท่านมีรายได้ต่อเดือน (รวมถึงรายได้พิเศษ) ทั้งสิ้นเฉลี่ย ..... บาท
9. ขณะนี้ท่านอาศัยอยู่ที่
 

<input type="checkbox"/> 1 บ้านของตนเองหรือครอบครัว	<input type="checkbox"/> 2 บ้านเช่า (เช่าเอง)
<input type="checkbox"/> 3 หอพัก/แฟลต (โรงงานจัดให้)	<input type="checkbox"/> 4 อื่นๆ ระบุ .....
10. ขณะนี้ท่านพักอยู่กับ
 

<input type="checkbox"/> 1 อยู่คนเดียว	<input type="checkbox"/> 2 คู่ครอง	<input type="checkbox"/> 3 ครอบครัว /ญาติ	<input type="checkbox"/> 4 เพื่อน
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11. ท่านมาทำงานโดย
 

<input type="checkbox"/> 1 รถส่วนตัว	<input type="checkbox"/> 2 รถบริษัท
<input type="checkbox"/> 3 รถประจำทาง	<input type="checkbox"/> 4 อาศัยมากับผู้อื่น
12. ท่านมีโรคประจำตัวหรือไม่ (ตอบได้มากกว่า 1 ข้อ)
 

<input type="checkbox"/> 1 ไม่มี	
<input type="checkbox"/> 2 โรคความดันโลหิตสูง	<input type="checkbox"/> 3 โรคหัวใจ
<input type="checkbox"/> 4 โรคเบาหวาน	<input type="checkbox"/> 5 โรคมะเร็ง
<input type="checkbox"/> 6 โรคตับ	<input type="checkbox"/> 7 โรคไต
<input type="checkbox"/> 8 ไขมันในเลือดสูง	<input type="checkbox"/> 9 โรคเกาต์
<input type="checkbox"/> 10 โรคอื่นๆ ระบุ .....	

**13. สภาพสิ่งแวดล้อมในการทำงานตามการรับรู้ของท่านเป็นอย่างไร (ตอบได้มากกว่า 1 ข้อ)**

- 1 สภาพสิ่งแวดล้อมในการทำงานดี
- 2 ร้อนมากเกินไป  3 หนาวมากเกินไป
- 4 เสียงดังมาก  5 เหนียวมากเกินไป
- 6 การระบายอากาศไม่ค่อยดี  7 มีการสั่นสะเทือนมาก
- 8 แสงน้อยเกินไป  9 พื้นที่ในการทำงานคับแคบจนรู้สึกอึดอัด
- 10 โต๊ะทำงานต่ำเกินไป  11 เก้าอี้นั่งปรับระดับไม่ได้
- 12 มีปริมาณสารเคมีมากเกินไป  13 มีคนเดินพลุกพล่านเกินไป
- 14 อื่นๆ ระบุ .....

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**ส่วนที่ 2 วิถีชีวิต**

**1. ในช่วง 3 เดือนที่ผ่านมา ท่านทำงานเป็นกะบ้างหรือไม่**

- 1 ไม่ทำงานเป็นกะ  2 ทำงานเป็นกะ

**2. ในช่วง 3 เดือนที่ผ่านมา ท่านทำงานเฉลี่ยวันละกี่ชั่วโมง โดยไม่รวมเวลาพัก**

- 1 น้อยกว่า 6 ชั่วโมง  2 7-8 ชั่วโมง
- 3 9-10 ชั่วโมง  4 11-12 ชั่วโมง
- 5 มากกว่า 12 ชั่วโมง

**3. ในช่วง 3 เดือนที่ผ่านมา ท่านได้รับประทานอาหารครบ 3 มื้อสม่ำเสมอหรือไม่**

- 1 ไม่ครบ 3 มื้อเป็นประจำ  2 ครบ 3 มื้อเป็นบางวัน
- 3 ครบ 3 มื้อทุกวัน

**4. ปัจจุบัน ท่านสูบบุหรี่หรือไม่**

- 1 ไม่เคยสูบเลย  2 เลิกสูบแล้ว (นานประมาณ ..... วัน ..... เดือน ..... ปี)
- 3 สูบ วันละประมาณ ..... มวน (..... ซอง)

**5. ปัจจุบัน ท่านดื่ม สุรา เบียร์ หรือ เครื่องดื่มอื่น ๆ ที่มีแอลกอฮอล์ หรือไม่**

- 1 ไม่เคยดื่มเลย  2 เลิกดื่มแล้ว (นานประมาณ ..... วัน ..... เดือน ..... ปี)
- 3 ดื่ม สัปดาห์ละ ..... วัน

6. ในช่วง 1 เดือนที่ผ่านมา ท่านออกกำลังกายสัปดาห์ละกี่ครั้ง (นับรวมเฉพาะครั้งที่ระยะเวลาไม่น้อยกว่า 30 นาที/ ครั้ง)

- [ ] 1 ไม่เคยออกกำลังกายเลย
- [ ] 2 1 ครั้งต่อสัปดาห์
- [ ] 3 2 ครั้ง ต่อสัปดาห์
- [ ] 4 3 ครั้ง หรือ มากกว่า 3 ครั้ง ต่อสัปดาห์

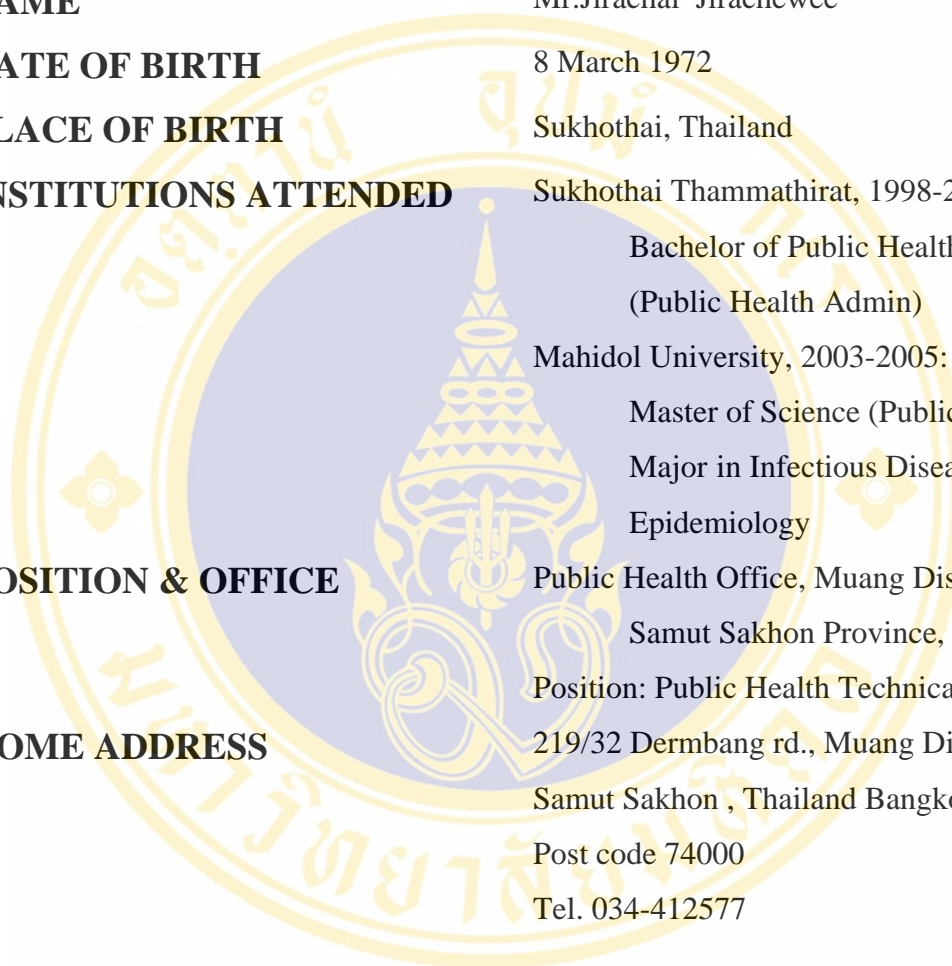
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**ส่วนที่ 3** บรรยากาศในการทำงาน

ทำเครื่องหมาย ✓ ลงในช่องว่าง ตามความคิดเห็นที่ท่านเห็นว่าเหมาะสมที่สุดเพียงข้อเดียว  
 บรรยากาศในการทำงานที่ท่านทำทุกวันนี้ ท่านมีความเห็นว่า

ข้อความ	ไม่เห็นด้วย อย่างยิ่ง	ไม่ เห็นด้วย	ไม่ แน่ใจ	เห็นด้วย	เห็นด้วย อย่างยิ่ง
1. ท่านจำเป็นต้องเรียนรู้สิ่งใหม่ๆในการทำงาน					
2. งานที่ท่านทำเป็นงานที่ซ้ำซาก จำเจ น่าเบื่อ					
3. งานที่ท่านทำต้องการความคิดริเริ่มสร้างสรรค์					
4. งานที่ท่านทำ ท่านสามารถตัดสินใจได้ด้วย ตนเอง					
5. งานที่ท่านทำต้องการความชำนาญสูง					
6. ท่านมีอิสระในการตัดสินใจเกี่ยวกับงานน้อย					
7. งานที่ท่านทำมีความหลากหลายในการปฏิบัติ					
8. ท่านสามารถวิจารณ์เกี่ยวกับงานที่ท่านทำได้					
9. ท่านมีโอกาสที่จะพัฒนาความสามารถของ ตนเอง					
10. ท่านทำงานได้รวดเร็ว					
11. ท่านรู้สึกทำงานหนัก					
12. งานที่ท่านทำมีปริมาณมาก					
13. ท่านมีเวลาเพียงพอในการทำงานตามที่ได้รับ มอบหมายในแต่ละวัน					
14. ท่านไม่มีความขัดแย้งกับผู้ร่วมงาน					

ข้อความ	ไม่เห็นด้วย อย่างยิ่ง	ไม่ เห็นด้วย	ไม่ แน่ใจ	เห็นด้วย	เห็นด้วย อย่างยิ่ง
15. งานที่ท่านต้องการความกระฉับกระเฉง ว่องไว					
16. จุดที่ท่านทำงานอยู่ ทำให้ร่างกายของท่าน เมื่อยล้า					
17. งานที่ท่านทำเป็นลักษณะงานประจำ					
18. ตำแหน่งหน้าที่การงานที่ท่านทำมีความมั่นคง					
19. ท่านอาจถูกให้ออกจากงานในอนาคต					
20. ผู้บังคับบัญชาของท่านให้ความห่วงใยต่อ สวัสดิการของผู้ใต้บังคับบัญชา					
21. ผู้บังคับบัญชาของท่านให้ความสนใจต่อสิ่งที่ ท่านเสนอ					
22. ผู้บังคับบัญชาของท่านให้ความช่วยเหลือต่อ การปฏิบัติงานที่ท่านทำเป็นอย่างดี					
23. ผู้บังคับบัญชาท่านเป็นผู้นำที่ดี และทำให้ บุคลากรทำงานร่วมกันเป็นอย่างดี					
24. เพื่อนร่วมงานที่ท่านทำเป็นผู้ที่มีความสามารถ และรอบรู้ในงาน					
25. เพื่อนร่วมงานสนใจในสิ่งที่ท่านพูด					
26. เพื่อนร่วมงานส่วนใหญ่เป็นมิตรกับท่าน					
27. เพื่อนร่วมงานช่วยเหลือท่านเป็นอย่างดี					

**BIOGRAPHY**

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