

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

This chapter emphasizes on the background of study, problem statement, research objectives, research questions and research hypothesis, significance of this research, scope and limitation of study. The conceptual framework and variables of this study also provided in this chapter.

### 1.2 Research Background

Generally, construction site is a place where a building is built or repaired. Construction site involves many workers in hot environment. This study was conducted in Pahang, Malaysia. Therefore, reviews about climatic change in Malaysia need to be contemplated. Situated in the equator, Malaysia's climate can be classified as tropical, being hot and humid throughout the year. During daytime temperatures may rise above 30°C year-round and night-time temperature rarely drop below 20° C. Basically, during the year, 250 centimetres of average rainfall and 27°C of average temperature in Malaysia. Malaysia experiences two monsoon winds seasons which are Southwest Monsoon occur typical from late May to September and Northeast Monsoon from November to March. The Northeast Monsoon brings more rainfall compared to the Southwest Monsoon, originating in China and the north Pacific. Meanwhile, the Southwest monsoon originates from the deserts of Australia. Usually, March and October forms transition between two monsoons.

Heat stress is the overall heat load to which an employee may be exposed to the combined contributions of metabolic heat, environmental factor such as air temperature,

humidity, air movements and radiant heat as well as clothing requirements. Heat stress occurs when the body's means of controlling its internal temperature starts to fail (DOSH, 2016). Heat stress can be the cause of serious health problem for workers who have to work in hot environment such as construction site. This can also increase fatigue and stress, as well as creating chances for accidents to occur. According to DOSH (2016) there were three cases reported in year 2013 and 2014 due to heat related illness which has led to failure. Those cases happened among trainees during field training under the hot sun.

Heat is a serious hazard in construction site. There is a negative impacts on workplace safety due to thermally stressful environment. Working under high air temperature and high humidity together with strenuous physical activities give a higher probability for inducing heat stress to workers. Conducting outdoor operations in hot environment like construction site and waste site activities, are also cause heat stress among workers. Too much exposure to heat can cause tiredness, dizziness, weakness and slowing down job performance (Atha, 2013). Referring to Canadian Centre for Occupational Health and Safety (CCOHS) once the air temperature rises from the normal range, there will be a change of workers' body comfort and also job performances. Increase ill humour, loss of focus and ability to do heavy work. Subsequently, worker normally starts to feel uncomfortable, when the humidex rating is within 40-45<sup>0</sup>C range (CCOHS, 2016). However, people are susceptible to heat stroke during summer as some reports depicted that risk of heat stroke are repeatedly occurred in summer (Morioka, Miyai and Miyashita, 2006). However, heat stress could be urged on human figure from thermal environment, there will be a consequences heat strain on human body which also may cause physiological reaction such rises of skin temperature, sweat output, increase heart rate and intense of core temperature (Brake, 2002). There are also several symptoms when a body perceived a lot of heat exposure such as nausea, dizziness, headache, fatigue, high body temperature and many more. There are many health problems related to operations in hot environment that any workers are exposed to, such as cramps, heat syncope, heat exhaustion, heat rash, and heat stroke. Workers might confront the risk of heat stress depends on many things. These include the physical condition of the workers, the surrounding temperature, types of cloth that workers put on and how heavy their job.

According to Factories and Machinery Act (FMA) 1967, Section 22(d) (i) stipulates effective and suitable provision shall be made for securing and maintaining such temperature in ensuring reasonable conditions of comfort and prevention from bodily injury to any person employed. Occupational Safety and Health Act (OSHA) 1994 also states in Section 15(1) and Section 15(2) (e) stipulates the duty of employers and self-employed persons to their employees. The provision and maintenance of working environment for the employees should be as far as practicable, safe and without risk to health while at work.

This research was carried out to study on how heat exposure induce health problems to workers. It also crucial in ensuring the health and safety of workers in order to enhance job performance among workers in construction site. Also, to minimize any heat-induced injury. Convenient workplaces are important to maintain the workers focus and health during working hour.

### **1.3 Problem Statement**

Working under hot air temperature and high humidity with tough physical activities have a huge potential for creating heat stress exposure. Any activities or operations conducted such as in factory, construction and waste site activities are probably can cause heat stress among workers. Heat stress exposure can cause detrimental issues if not being addressed. Prolong exposure to heat can emerge many symptoms ranging from mild signs to fatal. Heat-related illness (HRI) may happen as a result from long exposure to extreme heat (Fleischer *et al.*, 2013).

First and foremost, the significant problem of this study was hot environment caused heat stress exposure. Workplaces with risks of extreme heat exposure included outdoor and maintenance work, mining (Donoghue, 2000), firefighting (Ramphal L., 2000) and other emergency and essential services. Besides, workers who deal with outdoor activities like in construction site have a chance of 20-fold in increase rate of heat- related death compared with persons in other field of work (Atha, 2013). This study explored on how serious working under excessive heat expose can affect workers' health.

Next problem of this study was various threatening effects of heat exposure on workers' health. For instance, the most high-risk effect of heat exposure was heat