

THE IMPACT OF WORK-REST SCHEDULING ON PROLONGED STANDING
ACTIVITY

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To my beloved mother and father

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ABSTRACT

Prolonged standing is one of the common activities in electronic industry as the task requirement. Prolonged standing can cause discomfort on the body of the workers and can lead to injury and occupational disease. One of the ergonomic intervention is through improved the work-rest schedule. The purpose of this study is to identify the fatigue level from the perception of the workers. Besides that, the objective of this study also to investigate the impact of the work-rest to the standing workers for 12 hours working time with a different gender. This study involved two methods which are self-assessment by conducting the interview and direct technical assessment by using electromyography (EMG). For direct assessment, it involved 80 workers has been interviewed in order to identify the current fatigue level. Then, EMG was attached to the 15 workers at the leg and lower back to analyse the muscle efforts. In terms of perception, the results show the domination of the lower body region with the higher mean at the lower back, legs, and foot ankle as discomfort pain and fatigue. There is a significant relation between gender and work-rest schedule. The results show short frequent break by 10 minutes can reduce the fatigue at the leg and infrequent long break is preferable in order to reduce the fatigue at the lower back. This study will provide a view for industrial consultants or ergonomist with evidence to support for ergonomic interventions for prolonged standing activity for work-rest schedule in order to reduce discomfort pain and fatigue

ABSTRAK

Berdiri yang berpanjangan adalah salah satu aktiviti yang biasa dalam industri elektronik sebagai keperluan tugas. Berdiri berpanjangan boleh menyebabkan ketidakselesaan pada badan pekerja dan boleh membawa kepada kecederaan dan penyakit pekerjaan. Salah satu cara mengatasi yang ergonomik adalah melalui penambah-baikkkan jadual kerja- rehat. Tujuan kajian ini adalah untuk mengenalpasti tahap keletihan dari segi persepsi pekerja. Selain itu, objektif kajian ini juga adalah untuk menyiasat kesan daripada kerja- rehat kepada pekerja yang bekerja selama 12 jam dan kesan perbezaan jantung. Kajian ini melibatkan dua kaedah iaitu penilaian sendiri dengan menjalankan temuduga dan penilaian teknikal secara langsung dengan menggunakan Electromyography (EMG). Bagi penilaian langsung, ia melibatkan 80 pekerja yang telah ditemuramah untuk mengenal pasti tahap keletihan semasa. Kemudian, EMG diletakkan pada badan 15 pekerja di bahagian kaki dan pinggang belakang untuk menganalisis aktiviti otot. Keputusan menunjukkan penguasaan kawasan badan yang lebih rendah dengan min yang lebih tinggi di bahagian pinggang belakang, kaki, dan buku lali kaki menunjukkan ketidakselesaan dan keletihan. Terdapat hubungan yang signifikan antara jantung dan jadual kerja-rehat. Keputusan menunjukkan rehat yang pendek tetapi kerap dengan 10 minit boleh mengurangkan keletihan pada kaki dan rehat lama kurang kerap adalah lebih baik untuk mengurangkan keletihan di pinggang belakang. Hasil daripada kajian ini akan memberikan pandangan untuk perunding perindustrian atau ergonomist dengan bukti untuk menyokong cara mengatasi aktiviti berdiri lama melalui jadual kerja-rehat bagi mengurangkan ketidakselesaan dan keletihan.

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CHAPTER 1

INTRODUCTION

Chapter one in this study is the initial part in conducting the project of research. Chapter 1 will guide on the direction of the flow of project within the scopes. This introduction will give an overview on the background of the problem of prolonged standing and work-rest schedule until the significant of the study.

1.1 Background of the Problem

Industrial sector provides more opportunity in job and career development. By increasing the number of the industrial sector directly increase the number of the injuries and occupational diseases in the real life. Without most of the people realized the occupational disease and injuries directed increase the medical cost and loss of the productivity. Based on the study by the Zakaria *et al.* (2012) one of the factor workplace accidents is stress and fatigue. Prolonged standing is one of the common activities in the industrial sector as the task requirement. During prolonged standing, the body weight transfers and the center of pressure movement at the feet or movement at lumbar spine where the pain develops. However, lack of awareness among employer regarding this issue as they believe the break given is sufficient for the employees without taken into consideration of the workload as long as fulfill the target of the company.

One of the methods to reduces the muscles fatigue or pain development in prolonged standing is by administration controls, which are job rotation or improve

the design of work-rest schedule. As we noticed most of the company having similar break times by neglected the environment of the work or task performance. By improving the work-rest schedule without any cost, this helps the workers to reduce the muscle fatigue and improve the health. This will help the company to reduce the cost of medical and increase productivity. However, there is a lack of study provided regarding this issue of work-rest schedule. Based on this background, this study attempted to develop a work-rest schedule that able to improve the muscle fatigue and decrease the number of occupational injuries.

1.2 Statement of the Problem

In Malaysia, electronic industry is one of the biggest industries that contribute to the industrial sector. It has been exposed to the un-ergonomic environment by prolonged standing, improper working posture and repetitive task that may lead to the occupational disease. Preventing musculoskeletal disorders in the workplace has become a top priority in order to bring about the improvement of productivity to hasten a return on investment (Ahmad *et al.*, 2006) and this can be done by focusing on the ergonomic interventions and solution. As noticed electronic industry mostly the operators are female, which works about 8 hours per day or over.

Prolonged standing activity facing by the operators can cause fatigue or discomfort that lead to absenteeism, low productivity, and medical cost. Work-rest schedule is one of the improvement can be applied in reducing the fatigue for prolonged standing and considering the gender of the operators. In general, gender brings significant effect toward work capacity. Based on the study conducted by Hicks. L (2001) women are more resistant to fatigue compared to the man. Through his research it can be concludes sex differences can effects the muscle fatigue development.

- (ii) This study can help or become guidelines in develop suitable work-rest schedule for the improvement of the productivity and reduce occupational injuries in the industry.

1.6 Organization of the Thesis

This thesis is organized into 5 chapters. Chapter 1 serves as an essential introduction to the research. Chapter 2 provides background information and a review of related literature that leads to the formulation of this report. Chapter 3 describes the research methodology and its rationale. The result and findings of this thesis will be discussed in Chapter 4 and Chapter 5 will conclude this study.

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