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**RELATIONSHIP BETWEEN ERGONOMICS FACTORS AND
OCCUPATIONAL STRESS OUTCOMES AMONG AIRPORT
STAFF AT KUALA LUMPUR INTERNATIONAL AIRPORT**

By

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**Thesis Submitted to Othman Yeop Abdullah Graduate School of
Business, University Utara Malaysia,
In Fulfillment of the Requirement for the
Master of Science Occupational Safety and Health Management
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ABSTRACT

Ergonomic is the major cause of stress among employees and this has set to become a vital factor that contributes to stress among employee especially in the aviation industry. However, creating awareness regarding ergonomic and occupational stress can help the organization to minimize and control the impact that it may bring to their employees and the organization cost.

This research examines the ergonomic factors such as body postures, health, work area design, working chair, humidity, lighting, working hours toward stress outcomes among the airport staff. These ergonomic factors help to identify the most prevalence factor and its relationship that effect occupational stress among airport staff.

Thus, in order to identify the contributing factors of this study, there are 6 types of methods used namely normality analysis, multicollinearity, reliability analysis, mean and standard deviation, person correlation and multiple regression. Data collected from 370 employees at Kuala Lumpur International Airport, Sepang, Selangor mainly working in the airside and landside division. The result shows that there is a relationship between the variables body posture, health, humidity, acoustic, lighting and working hours toward stress outcome. Two other variables work area design and working chair have no significant relationship with workplace stress.

In conclusion, the finding of this study suggests it is important to promote ergonomic concepts and practice. Ergonomic applications can be instilled in various industries so that both employers and employees' benefits can become aware of design concepts and work methods, this can help to improve workplace conditions as well as enhancing work occupational safety and health in the airport.

Keyword: Ergonomic, Occupational Stress, Somatic stress, Job Dissatisfaction, Intension to Quit

ABSTRAK

Ergonomik adalah penyebab utama tekanan di kalangan pekerja dan ini telah menetapkan untuk menjadi faktor penting yang menyumbang kepada stres di kalangan pekerja terutamanya dalam industri penerbangan. Walau bagaimanapun, mewujudkan kesedaran berkenaan ergonomik dan tekanan pekerjaan boleh membantu organisasi untuk meminimumkan dan mengawal kesan yang boleh membawa kepada pekerja mereka dan kos organisasi.

Kajian ini mengkaji faktor ergonomik seperti rawatan badan, Kesihatan, rekabentuk kawasan kerja, kerusi kerja, kelembapan, pencahayaan, waktu bekerja ke arah hasil stres di kalangan kakitangan Lapangan Terbang. Faktor ergonomik ini membantu mengenal pasti faktor yang paling prevalens dan hubungannya yang mempengaruhi tekanan pekerjaan di kalangan kakitangan Lapangan Terbang.

Oleh itu, bagi mengenal pasti faktor penyumbang kajian ini, kaedah yang digunakan untuk kajian ini dibahagikan kepada 6 jenis kaedah iaitu analisis, multicollinearity, analisis kebolehppercayaan, min dan sisihan piawai, korelasi orang dan regresi berganda. Data yang dikumpul dari 370 pekerja di Lapangan Terbang Antarabangsa Kuala Lumpur, Sepang, Selangor terutamanya bekerja di bahagian Airside – betul dan landside. Hasilnya menunjukkan bahawa terdapat hubungan antara pembolehubah badan variabel, Kesihatan, kelembapan, akustik, pencahayaan dan waktu bekerja ke arah keputusan stres. Dua pembolehubah lain kerja kawasan Reka bentuk dan kerusi kerja tidak mempunyai hubungan yang signifikan dengan tekanan tempat kerja.

Kesimpulannya, dapatan kajian ini mencadangkan ia adalah penting untuk menggalakkan konsep dan amalan ergonomik. Aplikasi ergonomik boleh digunakan dalam pelbagai industri supaya kedua-dua majikan dan faedah pekerja dapat menyedari konsep reka bentuk dan kaedah kerja, ini boleh membantu untuk meningkatkan keadaan tempat kerja serta meningkatkan keselamatan pekerjaan dan Kesihatan di Lapangan Terbang.

Kata kunci: Ergonomik, Tekanan Pekerjaan, Tekanan Somatik, Ketidakpuas Bekerja, Niat untuk berhenti

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CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter presents brief information about the background of the study, problem statement, followed by research objective, research questions, scope of study, significant of the research finally explanation on definition of term and summary of the chapter that are used to discourse this research.

1.1 Background of the study

Stress is a part of everyday human life; however, this is not necessarily a negative phenomenon. In today's modern and challenging world, occupational stress has reached the level of harmful risk health among employees; this is due to excessive demands on job performance and lack of general well-being in various organizations. According to the World Health Organization (World Health Organization, 2013) occupational stress has become a critical issue. It is the response that workers may have due to job dissatisfaction, work demands and pressures when their employer gives a work task that unequal with their length of knowledge and specific abilities. This is agreed by Akanji (2002) stated that experts have always perceived occupational stress to happen between the physiological demands and the lack of competency on specific tasks that have pressurized employees to cope and adapt to the workload demands.

In customer-oriented fields organization especially in the airline industry that often encountering a conflict on job demand from their companies, supervisors, and customers may highly likely to develop stress (Campion, 2016). Asserted by Ajala, (2012) researchers have always seen stress among employees are negatively affecting employee workers in performing jobs efficiently and productively have increased turnover rates and costs within the organization. The World Health Organization (World Health Organization, 2013) asserted that depression would be the top disease and soon will outstrip cardiovascular disease among employees in the workforce. It was recently reported by STAR online Investing in the mental health of workers (2017) which has informed that by 2020 mental illness is the main concerning problem affecting Malaysian employees.

Ergonomic factor comprising the aspects of environmental stressor like humidity, noise, and lighting; work area design, working chair, and body posture. Research by Kress (2018) stated that ergonomic is the design within the workplace which includes the design of the equipment, instrument, machine and system application. Illness and hazard that related to ergonomic such cumulative trauma disorder (CTD), low back pain (LBP), musculoskeletal disorder (MSDs), carpal tunnel syndrome (CTS), and other illness (Design, 2017).

The Aviation industry is segregated into two areas. The airside defined as a system of 3 components such as Run-aways, taxis-ways, and apron-gate areas. This group of workers includes pilots, flight attendants, flight engineers, ground handlers, ramp agents, baggage and cargo handlers and air traffic control. While landside is defined as the areas and operations within airport boundaries, exclusive of the airside, this group of workers is among ticket agents, customer service and crew schedulers coordinator, etc. (Hom and Orman, 1975). These groups of workers are often

exposed to ergonomic in their workplace, which can affect their health and psychosocial stress.

Therefore, from this study, it will seek to examine its association between ergonomic factors variable that contributes to stress outcomes among airport workers in Kuala Lumpur International airport.

1.2 Problem Statement

A positive stress in the workplace can encourage the worker to growth and development more in a wide range of tasks and activities within the workplace. On the contrary, the negative side of stress or strain may affect the employee health problem and risks in the long run (Campion, 2016). However, according to Kane *et al.*, (2015) an organization that builds its working culture base on mutual support and cooperation can create a stronger and productivity environment toward their employee wellbeing and health.

Occupational stress is defined as any uncomfortable situation that the employees faced when they are unable to cope to their work demands, because of stressful situations and lack of abilities within the workplace. Because of this reason occupational stress has become a worldwide phenomenon and among the most challenging issues in occupational safety and health. (Karimi and Alipour, 2011). According to Taneja, (2007) aviation sector is determined as a stressful place. The airport is an industry that operates 24 hours a day and 7 days a week, employees have to work shift hours and heavy work pressure environments, this making them expose to chronic fatigue due to work. This is agreed by Sun and Chiou (2011) stress at the workplace especially in the aviation industry has reached an alarming stage,

especially to the low levels workers such as customer service, ramp agents and baggage handlers.

Kuala Lumpur International Airport (KLIA) which operates on a 24 hours basis needs workers that able to monitor the airport operation to run well-ordered. Due to the rapid increase in the number of foreigner aircraft entering Malaysian airspace, there is a growing need for more employees to work in the airline industry (Malaysia Airport Holding Berhad, 2014). To fulfill this demand may cause the organization to pressure their workers to work overtime, this may lead to stress at the workplace and it will be a problem especially toward shift workers. Thus this can affect the health and wellbeing of the workers in the workplace (Demerouti et al., 2019).

Work-related stress is related to job demand, job position, career advancement, and colleague relationships between work, organizational structure and so forth (Cooper and Marshall, 1976). According to Ganster and Schaubroeck (1991), workplace stressors such as role conflict and obscurity, job overload, lack of power and repetitive work have led to outcomes such as job satisfaction, depression, quitting and somatic complain to name a few headaches, sleep problem and stomach upset.

Ground handlers had gained much attention last year 2017 stated by Malaysia Airports Holdings Berhad (MAHB) when more than 1,500 passengers were affected after 50 flights at Kuala Lumpur International Airport (KLIA) were delayed (Kannan, 2017). Nevertheless, According to the managing director Datuk Badlisham Ghazali (Kanyakumari, 2017), who stated that the baggage handling issues caused by a change in the work roaster of the ground crew and this had triggered them by protesting from coming to work.

The second issue is a complaint received from AirAsia passengers claimed that AirAsia ground baggage handlers were caught throwing passengers' luggage including a bicycle. The post also included a 30-second video that showed two ground handler unloading luggage from an AirAsia aircraft. According to CEO Tan Sri Fernandes (Fernando, 2018) who explained that the ground handler collaborates with a ground handling company Ground Team Red Sdn. Bhd. Furthermore, there is a possibility that the ground baggage handlers are suffering from body discomfort and pain, as stated by Bergsten (2017) that the ramp is situated around the aircraft, which is a factor to contend with and most ramp staff work up to 12 hours a day. Ground baggage handlers are often involved in doing manual tasking such as loading passenger baggage, mail, and cargo into the aircraft. Hence, is often involved in kneeling or squatting, repeated handling or lifting heavy materials, and awkward body positions (Yang *et al.*, 2005). Consequently, ground baggage handlers are associated with several physical factors that lead to developing the risks for a musculoskeletal disorder (MSDs) as a result, has created unhealthy body posture among the ramp agents (Valachi and Valachi, 2003).

This incident happens recently with Malaysia Airlines (MAS) whereby the ground staff on the landside did not put luggage tagging and have kept the passenger waiting for 22 hours before departing for their flight. At the same time, the recovered luggage was also vandalized by the ground handler by writing insulting words upon the passenger's luggage (Neily, 2018). Regarding these reported incidents, it is not yet known either it is either the work attitude or lack of work responsibility that has affected the work performance of the ground handlers. According to Thye (2017) the Malaysian Employers Federation (MEF), Datuk Shamsuddin Bardan stated that workplace-related depression also is distressing with the continuously increasing

number of employee that is showing symptoms of depression in Malaysia According to Sun and Chiou (2011) investigation into occupational stress and work performance show that work stress can affect worker's psychology and may affect their job performance. Stress among the airport workers is increasing due to worker practicing unsafe working adequate and poor morale during work (Sun and Chiou, 2011).

Many works of literature have shown eight main dominant variables as the contributing ergonomic factors to occupational stress outcomes among airport staff. Those variables are body postures, health, adjustable chair, work area design, humidity, followed by acoustic, lighting and working hours. These variables indicate a significant correlation towards occupational stress outcomes (Makhbul, Z. M., Alam, S. S., Azmi, S. M., & Talib, N. A., 2011). However, all these studies have only been done in other industries. For example, Bergsten et al., (2017) has conducted a study among flight baggage handlers and found that daily shoulder pain and association with work tasks and upper arm postures is positively correlated to stress. As such the results of these studies may not be applicable in the Malaysian context due to differences in economic, social and cultural backgrounds.

Besides that, previous studies showed mixed and inconsistent results and lack of study in Malaysia for these eight variables so there is a need for further research to be done in the Malaysian context. Thus, this research is conducted in a Malaysian International Airport to study the factors that lead to occupational stress outcomes among airport staff using these eight variables.

1.3 Research Questions

Based on the problem statements that have been discussed above, this study intends to discover the answer of the questions as follow:

- i. Is there any relationship between ergonomic factors, namely body postures, health, work area design, working chair, humidity, lighting, working hours and stress outcome among the airport staff?
- ii. Is there any relationship between working hours and stress outcome among airport staff?

1.4 Research objectives

Based on the above research questions, this study intends to achieve specific research objectives:

- i. To identify the relationship between ergonomic factors, namely body postures, health, work area design, working chair, humidity, lighting, working hours and stress outcome among the airport staff.
- ii. To study the relationship between working hours and stress outcome among airport staff.

1.5 Scope of the Study

The scope of the study is to study the ergonomic factors such as body postures, health, adjustable chair, work area design, humidity, followed by acoustic, lighting and working hours in a Kuala Lumpur International Airport, Sepang Selangor. called KLIA for this study. These eight variables were chosen since they were the strongest factor causing occupational stress outcomes based on previous literatures

conducted in an airport in other countries. Sepang Selangor is chosen due to the airport location and its high population whereby its estimated population is 212,050 thousand in 2018. This study is limited to only the Malaysia Airport Berhad Holding that working in KLIA.

1.6 Significant of study

The Malaysian economy has continued to grow since the past years, and the resultant positive growth has opened many opportunities. With a vast number of passengers entering Malaysia, there is a concern that airport staff might expose to occupational stress and ergonomic while performing their job. The tourism industry is highly competitive in terms of handling passengers' luggage with cautiousness. Therefore, understanding the working pattern and posture of airport staff will help the company and other related organizations to reduce occupational injury among airport staff.

As for organization, this study will benefit the aviation industry particularly Human Resource Manager, Operations Manager and the Training and Development Manager. Having this knowledge, these top management can organize better strategies to minimize the ergonomic and occupational stress outcomes among their subordinates. Management and employees can discuss a better approach to reduce stress among workers. When the stress is minimized, the organization can provide quality customer service to clients which eventually can boost the image and increase profit for the organization. In addition, providing training on safety in the workplace and education on the ergonomic approach can minimize the exposure of injury and occupational stress among airport staff, this will contribute significantly to the development of the Airline industry.

Apart from contributing to the organization, this study may also be important to the Department of Occupational Safety and Health (DOSH) in Malaysia, since occupational stress is one of the occupational diseases. This study may give some information on the development of OSH activities in the country, especially in the airline industry. This study will help DOSH to formulate new strategies and improve the enforcement of OSH in the workplace.

1.7 Definition of terms

The terms that are discussed in this research are ergonomic factors and occupational stress outcomes. For that reason, the definition of the key terms as follows:

Table 1.1: Definition of terms

Variable	Definition	Sources
Stress	Stress is the nonspecific response of the body to any demand.	Selye (1936)
Body postures	Prolonged standing in the workplace	Lafond (2009)
Health	A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity	World Health Organization (WHO)
Work Area Design	The systematic organization, design and articulation of work activities at one or more levels.	Torraco (2005)

Working Chair	A chair with adjustable seat height in which the height change, made to suit the size of a given occupant, will at the same time change the height of the backrest above the seat	Reineman and Carver (1989)
Acoustic / Noise	Noise is an unwanted sound	McKeown (2008)
Lighting	Anything that illuminates such as a lamp or candle.	Blonna (2005)
Working Hours	Amount of time spent by an individual to carry out a job or task	Brett (2003)

1.8 Conclusion

This chapter presented the background of the study, research problem, research question, research objective, the scope of the study, significant of the study and definition of terminology.

The next chapter, in chapter 2 describes the literature review, which focused on the relationship between the ergonomic factors that might contribute to job stress outcome that affects the employees within the airline industry.

CHAPTER 2

LITERATURE REVIEW

2.0 Introductions

This literature review chapter is going to elaborate on the relationship between ergonomic factors and stress outcomes among airport workers. It goes to reveal how many researchers have stated how different ergonomic factors have led to job stress as well as examine different relationships between ergonomic factors and job stress. This section will look and understand the mechanism through which they affected each other.

2.1 Definition of stress

Stress is defined by Michie (2002) and Kamarulzaman *et al.*, (2017) is referred to a situation when employee insufficiently has to face the external demands or pressures, and the workplace environment that may affect their physiologically and psychologically. Agreed by Slavich *et al.*, (2010) the employee will show the apparent symptom of stress in anxious, depressed, being angry and apathetic. Furthermore, this stress outcome can lead to a severe disease which includes stress-related diseases, low self-esteem, low quality of life and affected personal development. Furthermore, stated by Toussaint *et al.*, (2016) if stress is not prevented as soon as possible in the long term it could lead to a severe lifetime physical and mental health problem to an individual.

The beginning of stress started from the brain cerebrum and went through to all of the body systems. Severe stress embodies a series of diseases that will affect the

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APPENDIX A



Dear Respondents,

I am a Master Science student at University Utara Malaysia (UUM). As part of this course, I am required to undertake a research project on the Ergonomic factor impact on stress among Airport employees specifically with the Airline sector to fulfill the Master requirement of the university.

I understand recognize that your time is valuable and many demands are made upon it by your heavy workload. However, your participation in this survey, which will require only about 10-15 minutes of your time, is vital to the success of this study.

Please be assured that all your responses will be strictly for academic purposes only. Should you have any queries regarding this research please do not hesitate to contact me at dnately@gmail.com. Thank you very much for your cooperation in responding to the questionnaire. Your participation in this study is greatly appreciated.

Sincerely,

Dynatalie Delicious

MSc Candidate

RESEARCH QUESTIONNAIRES

Instructions: The Survey Question below is divided into a total of seven sections (Section A to G). Please help me to answer the survey below by filling out in the GOOGLE FORM. Thank you.

Bahagian A: Maklumat Demografi **Section A: Demographic Information**

Sila tanda (✓) pada ruangan yang sesuai atau isi pada tempat kosong, yang mana bersesuaian.

Please check (✓) in the appropriate box or fill in the blank, where appropriate.

1. Jantina anda (*Your gender*):
 - ☐ Lelaki (*Male*)
 - ☐ Perempuan (*Female*)
2. Taraf perkahwinan anda (*Your marital status*):
 - ☐ Bujang (*Single*)
 - ☐ Berkahwin (*Married*)
 - ☐ Janda/duda/bercerai (*Divorced/windowed*)
3. Tahap pendidikan tertinggi anda (*Your highest educational level*):
 - ☐ MCE/SPM/SPMV
 - ☐ Diploma
 - ☐ Sarjana Muda (*Bachelor degree*)
 - ☐ Ijazah Sarjana (*Master's Degree*)
 - ☐ Doktor falsafah (*PhD / Doctorate*)
 - ☐ Lain-lain, sila nyatakan (*Others, please specify*): _____
4. Bangsa (*Race*):
 - ☐ Melayu (*Malay*)
 - ☐ Cina (*Chinese*)
 - ☐ India (*Indian*)
 - ☐ Lain-lain, sila nyatakan (*Others, please specify*): _____
5. Umur anda (*Your age*):
 - ☐ <25 Tahun (< 25 years old)
 - ☐ 26-30 Tahun (26 – 30 years old)
 - ☐ 31-35 Tahun (31 – 35 years old)
 - ☐ 36-40 Tahun (36 – 40 years old)
 - ☐ 41-45 Tahun (41 – 45 years old)
 - ☐ >46 Tahun (46 > years old)

6. Sudah berapa lama anda berkhidmat dengan syarikat yang anda berkerja sekarang?
(How long have you been working with current company?)
_____ tahun (years)
7. Adakah purata gaji bulanan anda? (What is your Gross Salary Income?)
- ☐ RM1,500 – RM3,000
 - ☐ RM3,001 – RM4,500
 - ☐ RM4,501 – RM6,000
 - ☐ RM6,001 – RM7,500
 - ☐ RM7,501 – RM10,000
 - ☐ >RM10,000
8. Jumlah jam berkerja dalam seminggu? (Total of working hour per week)
- ☐ 40-48 Jam (hours)
 - ☐ 46-55 Jam (hours)
 - ☐ 56-65 Jam (hours)
 - ☐ 76-85 Jam (hours)
9. Dimanakah anantara berikut merupakan pekerjaan di syarikat penerbangan?
(Which of the following best describe your role in Airline industry?)
- ☐ Juruterbang (Captain and First Officer)
 - ☐ Pramugara / Pramugari (Flight attendants)
 - ☐ Jurutera Penerbangan (Flight Engineer)
 - ☐ Pengawal trafik udara (Air traffic controller)
 - ☐ Egen Pengendali / Bagasi dan kargo (Ramp Agents / Baggage and cargo handler)
 - ☐ Ejen tiket / krew (Ticket agents / Crew schedulers Coordinator)

SOAL SELIDIK ERGONOMIK DI TEMPAT KERJA (SURVEY OF ERGONOMIC WORKPLACE SAFETY)

Bahagian B: Faktor Postur Badan

Section B: Body Postures Factor

Fikirkan tentang kedudukan postur badan anda semasa menjalankan kerja. Se jauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your body postures aspects during working. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

Sangat tidak setuju (strongly disagree)	Tidak setuju (Disagree)	Berkecuali (Neither agree nor disagree)	Setuju (Agree)	Sangat setuju (strongly agree)
1	2	3	4	5

1	Perkerjaan saya memerlukan saya untuk berdiri lama dari kerusi kerja (My job needs me to frequently stand up from my working chair.)	1	2	3	4	5
2	Perkerjaan saya memerlukan saya untuk sentiasa mengangkat barang berat. (My job needs me to frequently carry heavy objects.)	1	2	3	4	5
3	Perkerjaan saya memerlukan saya untuk berdiri dalam masa yang lama. My job needs me to stand for long periods.	1	2	3	4	5
4	Saya melakukan pergerakan berulang untuk jangka masa yang lama. I do repetitive movements for long periods of time.	1	2	3	4	5
5	Saya berkerja dalam keadaan postur badan yang tidak selesa. I work in an uncomfortable posture.	1	2	3	4	5
6	Saya melakukan kerja pergerakan berulang dan kerap menggunakan bahagian tangan, lengan dan jari.	1	2	3	4	5

	<i>I do repetitive tasks and frequently use my arm, hand, or fingers.</i>					
7	<i>Pekerjaan saya membuatkan saya keletihan fizikal. My job makes me physically exhausted at the end of the day.</i>	1	2	3	4	5
8	<i>Saya sentiasa cuba untuk melakukan tugas saya di stesen kerja saya. I always hunch to do my tasks at my workstation.</i>	1	2	3	4	5
9	<i>Susunan kerja saya dan tempat duduk di stesen kerja saya sesak. The arrangement at my work and the seat at my workstation are congested</i>					



Bahagian C: Faktor kesihatan.**Section C: Health factor.**

Fikirkan tentang keadaan kesihatan anda di tempat kerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your health aspects in workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

Sangat tidak setuju (strongly disagree)	Tidak setuju (Disagree)	Berkecuali (Neither agree nor disagree)	Setuju (Agree)	Sangat setuju (strongly agree)
1	2	3	4	5

1	Saya telah mengambil cuti sakit kerana tekanan. <i>I have taken sick days because of stress.</i>	1	2	3	4	5
2	Saya mengalami tidur yang tidak lena atau tabiat tidur yang tidak teratur kerana masalah yang berkaitan dengan kerja. <i>I experienced sleeplessness/irregular sleep habits due to problems related to work.</i>	1	2	3	4	5
3	Saya rasa tertekan dengan kerja saya sekarang. <i>I feel tensed with my current job.</i>	1	2	3	4	5
4	Saya mempunyai masalah tidur disebabkan oleh kekejangan/sakit pada otot atau sendi saya. <i>I have trouble sleeping due to stiffness/aching at my muscles or joints.</i>	1	2	3	4	5
5	Saya mempunyai tahap kesihatan yang tidak memuaskan. <i>I have an unsatisfactory health level.</i>	1	2	3	4	5

Bahagian D : Kerusi bekerja.**Section D : Working chair**

Fikirkan tentang keadaan kerusi semasa anda semasa bekerja dan reka cipta di persekitaran tempat kerja anda. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang?

Bulatkan jawapan anda berpandukan skala di atas.

(Think about your working chair aspects within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Saya boleh melaraskan kerusi kerja saya dengan mudah. <i>I can adjust my work chair easily.</i>	1	2	3	4	5
2	Kerusi kerja saya boleh laras ke pelbagai posisi. <i>My working chair is adjustable into various positions.</i>	1	2	3	4	5
3	Kerusi kerja saya boleh laras. <i>My working chair is adjustable.</i>	1	2	3	4	5

Bahagian E : Faktor reka cipta di persekitaran tempat kerja.**Section E : Work area design**

Fikirkan tentang keadaan reka cipta di persekitaran tempat kerja anda. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your work area design aspects within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Stesen kerja saya menyediakan saya dengan kawasan kerja yang selesa. <i>My workstation provides me with a comfortable working area.</i>	1	2	3	4	5
2	Persekitaran kawasan kerja saya adalah memuaskan. <i>My work area's environment is acceptable.</i>	1	2	3	4	5

Bahagian F : Kelembapan**Section F : Humidity**

Fikirkan tentang keadaan kelembapan di tempat kerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about humidity aspects within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Suhu di ruang kerja saya adalah terlalu panas. <i>My work space's internal temperature is too hot.</i>	1	2	3	4	5
2	Terdapat pengudaraan minimum kawasan kerja saya. <i>There is minimal ventilation at my work area.</i>	1	2	3	4	5
3	Udara kawasan kerja saya adalah terlalu kering. <i>My work area's air is too dry.</i>	1	2	3	4	5
4	Terdapat bau busuk di ruang kerja saya. <i>Unpleasant odours are present at my work area.</i>	1	2	3	4	5
5	Udara kawasan kerja saya adalah terlalu lapuk. <i>My work area's air is too stale.</i>	1	2	3	4	5

Bahagian G : Faktor akustik di tempat kerja**Section G : Acoustics Aspects**

Fikirkan tentang tahap bunyi di persekitaran tempat kerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about noise level within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Tahap bunyi bising di kawasan kerja saya adalah dalam lingkungan had biasa. <i>The noise level in my work area is within normal limits.</i>	1	2	3	4	5
2	Persekitaran di ruang kerja tidak mempunyai masalah bunyi bising. <i>The workstation's environment has no noise problem.</i>	1	2	3	4	5

3	Tindakan sewajarnya terus diambil untuk mengurangkan tahap bunyi bising di kawasan stesen kerja saya. <i>Efforts are continuously made to minimize the noise level in my workstation area.</i>	1	2	3	4	5
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Bahagian H : Pencahayaan

Section H : Lighting

Fikirkan tentang keadaan pencahayaan di tempat kerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about lighting aspects within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Lampu di ruang kerja saya adalah memuaskan. <i>The lighting at my work area is satisfactory.</i>	1	2	3	4	5
2	Mempunyai sistem pencahayaan yang fleksibel di kawasan kerja saya. <i>A flexible lighting system exists at my work area.</i>	1	2	3	4	5
3	Lampu yang terang meningkatkan prestasi kerja saya. <i>The bright lighting increases my job performance.</i>	1	2	3	4	5
4	Pencahayaan yang mencukupi dibekalkan ketika saya melakukan tugas saya. <i>Adequate lighting is supplied when I am doing my tasks.</i>	1	2	3	4	5

Bahagian I : Waktu berkerja
Section I : Working Hours

Fikirkan tentang tempoh masa berkerja anda. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about working hours aspects within workplace. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

1	Saya merasa berpuas hati dengan waktu bekerja yang ditetapkan oleh organisasi. <i>I feel satisfied with the working hours fixed by the organization.</i>	1	2	3	4	5
2	Saya diberi tempoh rehat yang mencukupi semasa bekerja. <i>I am given sufficient rest periods within my working day.</i>	1	2	3	4	5
3	Waktu kerja yang tetap tidak menjejaskan kehidupan peribadi saya. <i>The fixed working hour does not affect my personal life.</i>	1	2	3	4	5

Bahagian J: Faktor Stres di tempat kerja
Section J: Factors stress at workstation

Fikirkan tentang tahap stres anda semasa menjalankan kerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your Stress aspects during working. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

Sangat tidak setuju (strongly disagree)	Tidak setuju (Disagree)	Berkecuali (Neither agree nor disagree)	Setuju (Agree)	Sangat setuju (strongly agree)
1	2	3	4	5

1	Kadang-kadang saya rasa kelesuan. <i>Sometimes I feel burned out.</i>	1	2	3	4	5
2	Saya mudah rasa marah / jengkel dengan persekitaran stesen kerja saya. <i>I easily feel annoyed / irritated with my workstation environment.</i>	1	2	3	4	5
3	Masalah di tempat kerja menyebabkan saya mengalami ketidakselesaan pada perut. <i>Work problems cause me to have abdominal discomfort.</i>	1	2	3	4	5
4	Masalah kerja membuat hati saya berdenyut lebih cepat daripada biasa. <i>Work problems make my heart beat faster than usual.</i>	1	2	3	4	5
5	Saya kehilangan selera makan kerana masalah kerja. <i>I lose my appetite due to work problems.</i>	1	2	3	4	5
6	Saya mudah penat dengan kerja. <i>I easily get tired of work.</i>	1	2	3	4	5
7	Saya merasa demotivasi untuk menyelesaikan tugas yang diberikan. <i>I feel demotivated to complete given tasks.</i>	1	2	3	4	5
8	Keletihan kerana kerja-kerja membuat saya murung dan tidak menggalakkan saya daripada melakukan kerja. <i>Tiredness due to work makes me depressed and discourages me from doing work.</i>	1	2	3	4	5

Bahagian K: Kepuasan berkerja

Section K: Job dissatisfaction

Fikirkan tentang kepuasan berkerja dalam pekerjaan anda. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your job satisfaction aspects of your job during working. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

	Ketidakpuasan kerja / Job dissatisfaction					
1	Apabila memikirkan tentang kerja, saya berasa letih dan marah. <i>When thinking about work, I feel tired and</i>	1	2	3	4	5

	<i>temperamental.</i>					
2	Saya tidak berpuas hati dengan pekerjaan terkini saya. <i>I am not satisfied with my current job.</i>	1	2	3	4	5
3	Umumnya, saya tidak menyukai pekerjaan saya sekarang. <i>Generally, I dislike my current job.</i>	1	2	3	4	5
4	Pekerjaan saya sentiasa berulang-ulang dan membosankan. <i>My jobs are repetitive and boring.</i>	1	2	3	4	5

Bahagian L: Niat untuk berhenti

Section L: Intention to quit

Fikirkan tentang niat anda untuk berhenti untuk berkerja. Sejauh mana anda bersetuju atau tidak bersetuju dengan setiap kenyataan di bawah yang menggambarkan majikan anda sekarang? **Bulatkan** jawapan anda berpandukan skala di atas.

(Think about your intention to quitting your job. To what extent you agree or disagree whether each statement below describe your current employer? **Circle** your answer using the scale below).

	Niat untuk berhenti / Intention to quit					
1	Saya suka bekerja dengan organisasi ini. <i>I like to work for this organization.</i>	1	2	3	4	5
2	Saya akan terus berusaha untuk pembangunan organisasi. <i>I will strive for the organization's development.</i>	1	2	3	4	5
3	Saya berasa bangga untuk bekerja dalam organisasi ini. <i>I am proud to work in this organization.</i>	1	2	3	4	5
4	Saya akan memberitahu kawan-kawan saya bahawa organisasi ini adalah tempat yang baik untuk bekerja di. <i>I will tell my friends that this organization is a good place to work in.</i>	1	2	3	4	5
5	Saya mengambil berat tentang nasib ini organisasi. <i>I care so much about this organization's fate.</i>	1	2	3	4	5
6	Saya tidak pernah terfikir untuk berhenti dan menyertai syarikat-syarikat lain. <i>I have never thought about quitting and join other companies.</i>	1	2	3	4	5

APPENDIX B

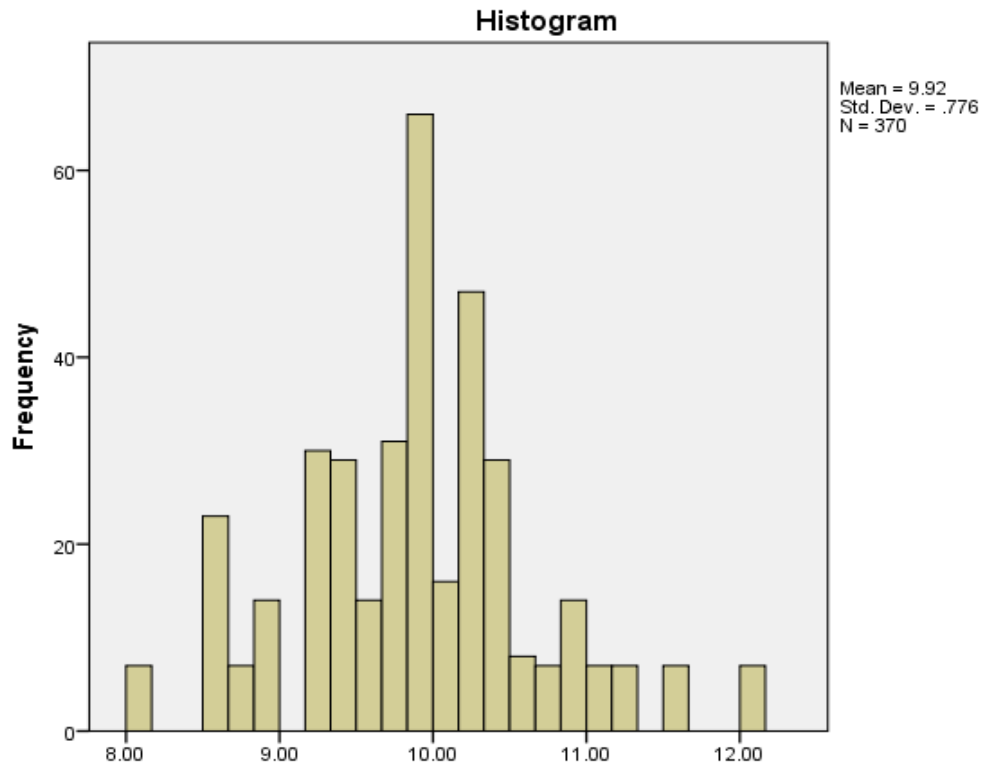
SPSS Output

NORMALITY ANALYSIS

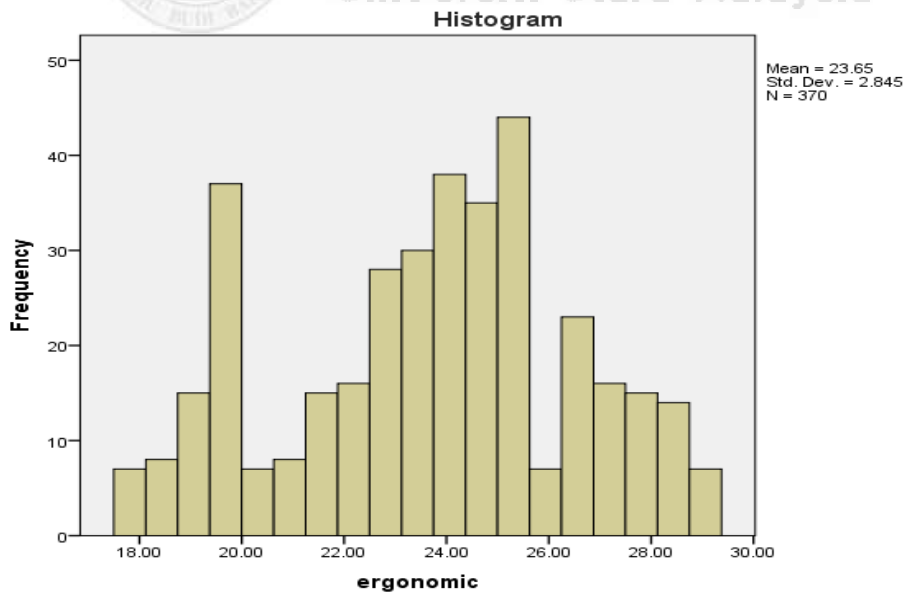
Descriptive				Statistic	Std. Error
stress_outcome	Mean			9.9155	.04033
	95% Confidence Interval for Mean	Lower Bound		9.8362	
		Upper Bound		9.9949	
	5% Trimmed Mean			9.8989	
	Median			9.9167	
	Variance			.602	
	Std. Deviation			.77581	
	Minimum			8.08	
	Maximum			12.17	
	Range			4.08	
	Interquartile Range			.83	
	Skewness			.256	.127
	Kurtosis			.617	.253
ergonomic	Mean			23.6485	.14788
	95% Confidence Interval for Mean	Lower Bound		23.3577	
		Upper Bound		23.9393	
	5% Trimmed Mean			23.6724	
	Median			23.8778	
	Variance			8.092	
	Std. Deviation			2.84458	
	Minimum			17.77	
	Maximum			29.02	
	Range			11.25	
	Interquartile Range			3.63	
	Skewness			-.204	.127
	Kurtosis			-.730	.253

a. Lilliefors Significance Correction

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
stress_outcome	.086	370	.000	.976	370	.000
ergonomic	.085	370	.000	.970	370	.000



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MULTI COLLINEARITY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.419 ^a	.176	.157	.71210

a. Predictors: (Constant), Workinghours, Workareadesign, Humidity, Lighting, Workingchair, Acoustics, Bodyposture, Healthfactor

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.035	8	4.879	9.622	.000 ^b
	Residual	183.058	361	.507		
	Total	222.093	369			

a. Dependent Variable: stress_outcome

b. Predictors: (Constant), Workinghours, Workareadesign, Humidity, Lighting, Workingchair, Acoustics, Bodyposture, Healthfactor

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	7.770	.402		19.332	.000		
	Bodyposture	.031	.229	.022	.137	.891	.087	11.461
	Healthfactor	.089	.233	.063	.383	.702	.085	11.813
	Workingchair	-.476	.131	-.345	-3.631	.000	.253	3.953
	Workareadesign	-.055	.075	-.041	-.740	.460	.745	1.343
	Humidity	.622	.126	.320	4.957	.000	.548	1.826

Acoustics				-			
	-.495	.164	-.311	3.02	.003	.215	4.645
				2			
Lighting	.736	.145	.448	5.08	.000	.294	3.396
				5			
Workinghours	.188	.137	.122	1.37	.171	.289	3.466
				2			

a. Dependent Variable: stress_outcome

REALIBILITY ANALYSIS

Reliability Statistics

Cronbach's Alpha	N of Items
.835	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Bodyposture	33.4799	8.986	.843	.789
Healthfactor	33.5786	8.870	.884	.784
Workingchair	33.5153	9.083	.782	.794
Workareadesign	33.7451	10.783	.247	.846
Humidity	33.8402	10.427	.568	.818
Acoustics	33.6027	9.369	.817	.795
Lighting	33.3944	9.539	.785	.798
Workinghours	33.5640	9.350	.793	.796
somatic_Stress	33.6201	10.768	.521	.823
Jobsatisfaction	33.8410	12.807	-.274	.883
Qutting	33.5397	11.368	.070	.865

MULTIPLE REGRESSIONS

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.419 ^a	.176	.157	.71210

a. Predictors: (Constant), Workinghours, Workareadesign, Humidity, Lighting, Workingchair, Acoustics, Bodyposture, Healthfactor

b. Dependent Variable: stress_outcome

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.035	8	4.879	9.622	.000 ^b
	Residual	183.058	361	.507		
	Total	222.093	369			

a. Dependent Variable: stress_outcome

b. Predictors: (Constant), Workinghours, Workareadesign, Humidity, Lighting, Workingchair, Acoustics, Bodyposture, Healthfactor

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.770	.402		19.332	.000
	Bodyposture	.031	.229	.022	.137	.891
	Healthfactor	.089	.233	.063	.383	.702
	Workingchair	-.476	.131	-.345	-3.631	.000
	Workareadesign	-.055	.075	-.041	-.740	.460
	Humidity	.622	.126	.320	4.957	.000
	Acoustics	-.495	.164	-.311	-3.022	.003
	Lighting	.736	.145	.448	5.085	.000
	Workinghours	.188	.137	.122	1.372	.171

a. Dependent Variable: stress_outcome

MEAN AND STANDARD DEVIATION

Statistics

		Body posture	Health factor	Working chair	Work area design	Humidity	Acoustics	Lighting	Working hours
N	Valid	370	370	370	370	370	370	370	370
	Missing	0	0	0	0	0	0	0	0
Mean		3.4922	3.3935	3.4568	3.2270	3.1319	3.3694	3.5777	3.4081
Median		3.4444	3.4000	3.3333	3.0000	3.1000	3.3333	3.6250	3.5000
Mode		3.44	3.40	3.67	3.00	3.20	3.33	3.75	3.67
Std. Deviation		.54723	.54714	.56236	.57601	.39906	.48825	.47199	.50424

PEARSON CORRELATION

Correlations

		stress_outcome	Bodyposture	Healthfactor	Workingchair	Workareadesign	Humidity	Acoustics	Lighting	Workinghours
stress_outcome	Pearson Correlation	1	.145**	.160**	.027	-.034	.281**	.104*	.207**	.166**
	Sig. (2-tailed)		.005	.002	.606	.517	.000	.045	.000	.001
	N	370	370	370	370	370	370	370	370	370
Bodyposture	Pearson Correlation	.145**	1	.940**	.826**	.179**	.629**	.756**	.653**	.799**
	Sig. (2-tailed)	.005		.000	.000	.001	.000	.000	.000	.000
	N	370	370	370	370	370	370	370	370	370
Healthfactor	Pearson Correlation	.160**	.940**	1	.819**	.254**	.625**	.812**	.726**	.790**
	Sig. (2-tailed)	.002	.000		.000	.000	.000	.000	.000	.000
	N	370	370	370	370	370	370	370	370	370
Workingchair	Pearson Correlation	.027	.826**	.819**	1	.332**	.477**	.754**	.694**	.711**
	Sig. (2-tailed)	.606	.000	.000		.000	.000	.000	.000	.000
	N	370	370	370	370	370	370	370	370	370
Workareadesign	Pearson Correlation	-.034	.179**	.254**	.332**	1	-.046	.282**	.398**	.210**

	Sig. (2-tailed)	.517	.001	.000	.000		.380	.000	.000	.000
	N	370	370	370	370	370	370	370	370	370
Humidity	Pearson Correlation	.281**	.629**	.625**	.477**	-.046	1	.516**	.377**	.509**
	Sig. (2-tailed)	.000	.000	.000	.000	.380		.000	.000	.000
	N	370	370	370	370	370	370	370	370	370
Acoustics	Pearson Correlation	.104*	.756**	.812**	.754**	.282**	.516**	1	.803**	.773**
	Sig. (2-tailed)	.045	.000	.000	.000	.000	.000		.000	.000
	N	370	370	370	370	370	370	370	370	370
Lighting	Pearson Correlation	.207**	.653**	.726**	.694**	.398**	.377**	.803**	1	.687**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	370	370	370	370	370	370	370	370	370
Workinghours	Pearson Correlation	.166**	.799**	.790**	.711**	.210**	.509**	.773**	.687**	1
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.000	.000	.000	
	N	370	370	370	370	370	370	370	370	370

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

