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**ERGONOMICS FACTORS AND THEIR RELATIONSHIP ON  
PHYSIOLOGICAL STRESS IN THE WORKPLACE**



**MASTER OF SCIENCES  
(OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT)**

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**ERGONOMICS FACTORS AND THEIR RELATIONSHIP ON  
PHYSIOLOGICAL STRESS IN THE WORKPLACE**

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**Thesis submitted to**

**Universiti Utara Malaysia,**

**in Partial Fulfilment of the Requirement for the Master of Sciences (Management)**

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## ABSTRACT

Physiological stress occurrence in manufacturing organization is quite increasing nowadays. It is also involve workers who work in an office area or known as officer workers. Through literature being made, it is revealed that poor ergonomics workstation environment is one of the major contributors to the physiological stress. Thus, this study aims to investigate the relationship between ergonomics factors (work process design, humidity, acoustics, lighting, working hours and workload) towards work stress outcomes (physiological stress). This research specifically, focusing on the most significant ergonomic factors (work process design, humidity, acoustics, lighting, working hours and workload) towards physiological stress. A total of 106 samples of office workers were derived from a manufacturing industry in Gebeng, Pahang by using convenience sampling technique. Questionnaires were used for data collection process. The major findings show that ergonomically designated workstation is a significant strategy in minimizing the physiological stress outcomes in organizations or work area. Through the multiple regression analysis, each ergonomics factor and component collectively have significant relationship with the physiological stress outcomes. The multiple regression analysis shows (work process design, humidity, acoustics, working hours and work load) factors have significant relationship with physiological stress outcomes. To be concluded from the findings, it is important to organization which is in need of healthy and competent office workers in line with the aspiration of dynamic human capital development.

**Keywords:** *Physiological stress, ergonomic work station, manufacturing, workplace*

## ABSTRAK

Kejadian tekanan fisiologi dalam organisasi pembuatan semakin meningkat pada masa kini. Ia juga melibatkan pekerja yang bekerja di kawasan pejabat atau dikenali sebagai pekerja pegawai. Melalui kesusasteraan yang dibuat, dinyatakan bahawa persekitaran stesen kerja ergonomik yang buruk adalah salah satu penyumbang utama kepada tekanan fisiologi. Oleh itu, kajian ini bertujuan untuk mengkaji hubungan antara faktor ergonomik (reka bentuk proses kerja, kelembapan, akustik, pencahayaan, jam kerja dan beban kerja) ke arah hasil kerja stres (tekanan fisiologi). Penyelidikan ini secara khusus memberi tumpuan kepada faktor ergonomik yang paling penting (reka bentuk proses kerja, kelembapan, akustik, pencahayaan, jam kerja dan beban kerja) terhadap tekanan fisiologi. Sejumlah 106 sampel pekerja pejabat diperoleh daripada industri perkilangan di Gebeng, Pahang dengan menggunakan teknik sampling kemudahan. Soal selidik digunakan untuk proses pengumpulan data. Penemuan utama menunjukkan bahawa stesen kerja ergonomik yang ditetapkan adalah strategi penting dalam meminimumkan hasil tekanan fisiologi dalam organisasi atau kawasan kerja. Melalui analisis regresi berganda, setiap faktor ergonomi dan komponen secara kolektif mempunyai hubungan yang signifikan dengan hasil tekanan fisiologi. Analisis regresi berganda menunjukkan (reka bentuk proses kerja, kelembapan, akustik, jam kerja dan beban kerja) faktor mempunyai hubungan yang signifikan dengan hasil tekanan fisiologi. Untuk disimpulkan dari penemuan, penting bagi organisasi yang memerlukan pekerja pejabat yang sihat dan kompeten selaras dengan aspirasi pembangunan modal insan dinamik.

**Kata kunci:** Tekanan fisiologi, stesen kerja ergonomik, pembuatan, tempat kerja

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## TABLE OF CONTENT

CONTENT	PAGE
DECLARATION	ii
PERMISSION TO USE	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENT	vii
LIST OF TABLES	x
LIST OF FIGURES	xi

### CHAPTER 1 INTRODUCTION

1.0	Background of the Study	1
1.1	Problem Statement	3
1.2	Research Questions	8
1.3	Research Objectives	8
1.4	Significance of the Study	9
1.5	Scope of the Study	9
1.6	Organization of the study	10
1.7	Conclusion	11

### CHAPTER 2 LITERATURE REVIEW

2.1	Introduction	12
2.2	Physiological Stress	12
2.3	Causes of Physiological Stress at workplace	16
2.4	Ergonomic Workstation factors	19
	2.4.1 Work Environment	19
	2.4.2 Ergonomics (Work Process Design)	22
	2.4.3 Humidity	24
	2.4.4 Acoustics	26
	2.4.5 Lighting	29
	2.4.6 Working Hours	31
	2.4.7 Workload	33



### **CHAPTER 3 METHODOLOGY**

3.1	Introduction	37
3.2	Research Framework	37
3.3	Hypothesis	38
3.4	Research Design	38
3.5	Operational Definition	40
3.6	Measurement	41
	3.6.1 Measurement Scale	44
3.7	Data Collection	46
3.8	Sampling Technique	46
	3.8.1 Population and Sample	47
	3.8.2 Sample Size	47
3.9	Data Collection Procedure	48
3.10	Techniques of Data Analysis	48
	3.10.1 Descriptive Analysis	49
	3.10.2 Reliability Analysis	49
3.11	Conclusion	50

### **CHAPTER 4 FINDINGS**

4.1	Introduction	51
4.2	Reliability Result for Pilot Test	51
4.3	Response Rate	52
4.4	Reliability Result for Actual Research	52
4.5	Demographic Data	53
4.6	Reliability, Descriptive Analysis and item loading, correlation analysis and regression analysis for all variables	55
	4.6.1 Reliability	55
	4.6.2 Descriptive Analysis	55
	4.6.3 Correlation analysis on Physiological Stress and Ergonomic Factors	61
	4.6.4 Multiple Regression Analysis	63
4.7	Conclusion	65

### **CHAPTER 5 DISCUSSION**

5.1	Introduction	66
5.2	Most Significant Factor In Ergonomic Workstation Variables Influence Stress Level For Office Workers	66
5.3	Relationship between ergonomics workstation factors and work stress outcomes (physiological stress).	69
5.4	Relationship between Humidity and Physiological Stress.	70
5.5	Relationship between Acoustics and Physiological Stress.	71

5.6	Relationship between Lighting and Physiological Stress	72
5.7	Relationship between working hours and Physiological Stress	73
5.8	Relationship between Work Load and Physiological Stress.	75
5.9	Limitation	76
5.10	Recommendation	77
5.11	Conclusion	78
<b>References</b>		<b>79</b>
<b>Appendices</b>		<b>94</b>



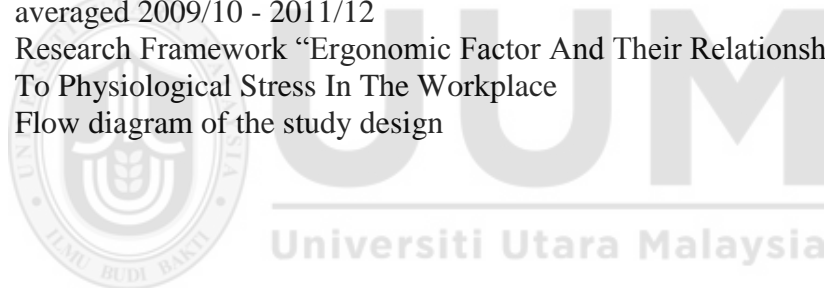
## LIST OF TABLES

3.1	Operational Definition	40
3.2	Measurement of Variables or Instrumentation	42
3.3	Respondent's Level	45
3.4	Correlation Variable Strength Value	45
3.5	Number of office worker for each plant.	47
4.1	Reliability (Pilot Test) for all variables	51
4.2	Reliability all (n = 106)	52
4.3	Participant's number (n) and percentage (%) based on demographic data	54
4.4	Means Value for all variables	58
4.5	Correlation analysis on Physiological Stress and Ergonomic Factors	62
4.6	Result of R Square	64
4.7	ANOVA	62
4.8	Result of Coefficients	65



## LIST OF FIGURES

1.1	Stress, depression or anxiety by cause, averaged 2009/10-2011/12	5
	Prevalence rate of work-related stress, depression or anxiety in	
1.2	Great Britain, by broad occupational category, per 100,000 people	7
	employed in the last twelve months, averaged over the period	
	2014/15-2016/17	
2.1	Days lost due to self-reported work-related stress, depression or	15
	anxiety in Great Britain, for people working in the last 12 months	
2.2	Percentage for work related stress in Malaysia	16
2.3	Stressful Characteristics of Work (Psychosocial Hazards)”	20
2.4	Environmental Comfort Model	21
2.5	Possible Effect of Temperature Level Affect Workers at	25
	Workplace	
2.6	Analysis of the effects of noise on mental health	28
	Estimated prevalence rates of self-reported stress, depression or	
2.7	anxiety in Great Britain, by how caused or made worse by work,	35
	averaged 2009/10 - 2011/12	
3.1	Research Framework “Ergonomic Factor And Their Relationship	38
	To Physiological Stress In The Workplace	
3.2	Flow diagram of the study design	39



# CHAPTER 1

## INTRODUCTION

### 1.0 Background of the Study

Stress is one of the fundamental problems facing by all human being. Stress can be neither good nor bad in a workplace. Nobody can resist stress in their life. Therefore, all human being from young or old, rich or poor, professional or unemployed person they are all potential victims to have stressed. Stress has become a part of human being life. The frustration, disappointment and pressures of daily life constitute the genesis of stress.

Stress can be managed if the stress is under once control, meaning that they can perform well under accurate amount of stress. However, when the stress becomes large and cannot be control by the individual it can seriously affect their health. This statement is supported by Noriah et al, (2014) in their study where they stated that work plays important role in human's life. Sometimes it can influence on their well being which is a good experience for many individuals, and sometimes can also be a tremendous sources of stress. Good kind of stress is called eustress and bad stress is called distress. Stress also have high related to health problem such as cardiovascular disease and anxiety disorders.

Stress also can affect once feel, behave and also think. Some people might feel concerned about not being able to deal with the stress or task. Others might think that the task or problem facing is hard to concentrate or able to think straight. Some might feel constantly tired therefore they tend to have not enough

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**BORANG SOAL SELIDIK**

**TAJUK KAJIAN:**

**FAKTOR ERGONOMIK DAN HUBUNGKAIT KEPADA TEKATAN  
FISIOLOGIKAL DI TEMPAT KERJA**

***ERGONOMIC FACTORS AND THEIR RELATIONSHIP TO PHYSIOLOGICAL  
STRESS IN THE WORKPLACE***

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Tuan dan Puan yang dihormati,

Tuan/ Puan telah terpilih sebagai responden bagi kajian ini. Kajian ini bagi memenuhi syarat penganugerahan Ijazah Sarjana Pengurusan Keselamatan dan Kesihatan Pekerjaan dan boring soal selidik ini merupakan salah satu cara yang dilakukan bagi melengkapi kajian ini. Semua maklumat yang diperoleh semasa kajian ini dilakukan adalah rahsia dan hanya digunakan bagi tujuan akademik sahaja. Segala masa, tenaga dan kerjasama yang diberikan untuk menjawab boring soal selidik ini amat dihargai dan didahulukan dengan ucapan ribuan terima kasih.

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**DISEDIAKAN OLEH:**

**WAN ASYRAF BIN WAN MOHD ABDUL RAHIM (818135)  
MASTER IN OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT  
UNIVERSITI UTARA MALAYSIA (UUM)**

**ARAHAN :** Soal selidik ini mempunyai enam bahagian A, B, C ,D, dan E. Sila jawab semua soalan yang dikemukakan.

This questionnaire has six parts A, B C, D, E & F. Please answer all questions.

**BAHAGIAN A :**

Sila tandakan [ / ] pada jawapan yang sesuai dan isikan tempat kosong dengan maklumat yang berkenaan dengan diri anda. Please tick [ / ] in the appropriate answer and fill in the blanks with information about yourself.

1. Jantina / Gender:

Lelaki/Male

Perempuan/Female

2. Umur/Age :

<20 year(< 20 tahun)

20 year ~30 year (20 tahun~30 tahun)

31 year~40 year (31 tahun~40 tahun)

41 year~50 year (41 tahun~50 tahun)

> 50 year (> 50 tahun)

3. Gaji kasar sebulan (*Monthly gross salary*)

<RM 1000

RM1000~RM1500

RM1501~RM2000

RM2001~RM2500

>RM2501

4. Latarbelakang pendidikan tertinggi *Highest education background*

SPM

STPM

Diploma

Ijazah/*Degree*

Ijazah Sarjana/*Master*

Doktor Falsafah/*Phd.*

5. Pengalaman bekerja (*Working experiance*)

< 1 tahun < *1 year*

1~ 5 tahun *1~5 year*

6~ 10 tahun *6~10 year*

10~15 tahun *10~15 years*

>15 tahun *>15 years*

**BAHAGIAN B : Persekitaran**  
**Section B: Work Enviroment**

Sila berikan pendapat anda tentang reka bentuk kerja di organisasi anda. Bulatkan satu angka yang sesuai dengan persepsi anda terhadap kenyataan di bawah berdasarkan skala berikut :

*Please give your opinion about the work design at your organization. Circle the one number that fits your perception of reality based on the following scale :*

<b>Sangat tidak setuju</b> <i>Strongly disagree</i>	<b>Tidak setuju</b> <i>Disagree</i>	<b>Kurang setuju</b> <i>Slightly disagree</i>	<b>Setuju</b> <i>Agree</i>	<b>Sangat setuju</b> <i>Strongly agree</i>		
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		
<b>Work process design/ Reka bentuk proses kerja</b>						
1.	Pekerjaan saya memerlukan saya DUDUK My jobs need me frequently TO SIT DOWN	1	2	3	4	5
2.	Pekerjaan saya memerlukan saya kerap membawa objek berat My jobs need me to frequently carry heavy object	1	2	3	4	5
3	Pekerjaan saya memerlukan saya DUDUK dalam jangka masa yang panjang My jobs need me to Sit down a long period	1	2	3	4	5
4	Saya melakukan pergerakan yang sama dalam tempoh yang panjang I do the same movement in a long period	1	2	3	4	5
5	Saya bekerja dalam keadaan kedudukan badan yang tidak selesa I work in a discomfort body posture condition.	1	2	3	4	5
6	Saya melakukan tugas yang berulang ulang dan kerap dengan menggunakan lengan, tangan atau jari pada setiap masa I do repetitive task and frequent use arm, hand or finger in a minute	1	2	3	4	5
7	Pekerjaan saya membuatkan fizikal saya letih pada penghujung hari My job make my physically exhausted at the end of the day	1	2	3	4	5
8	Saya sentiasa bertungkus lumus untuk melaksanakan tugas di tempat kerja saya I always hunch to do my task at my workstation.	1	2	3	4	5
9	Susunan di kawasan kerja adalah sesak The arrangement at my work area are congested	1	2	3	4	5

<b>Humiditi/ Humidity</b>						
1.	Suhu dalaman organisasi sangat panas Organization's internal temperature is too hot	1	2	3	4	5
2.	Peredaran udara dalam organisasi amat sedikit There is too little air movement in this organization.	1	2	3	4	5
3	Udara dalam organisasi sangat kering The organization's is too dry	1	2	3	4	5
4	Terdapat bau yang kurang menyenangkan pada udara dalam organisasi. There is unpleasent odor in the organization	1	2	3	4	5
5	Stesen kerja saya memberikan saya satu kawasan kerja yang selesa My work station provides me a comfortable working area.	1	2	3	4	5
6.	Persekitaran kawasan kerja saya adalah memuaskan My work area's environment is satisfactory	1	2	3	4	5

<b>Akustik/Acoustic</b>						
1.	Tahap bunyi bising di kawasan kerja saya adalah memuaskan. The noise level in my work area is satisfactory	1	2	3	4	5
2	Persekitaran stesen kerja tidak mempunyai masalah bunyi bising The workstation environment does not face any noise problem	1	2	3	4	5
3	Organisasi berusaha untuk meminimumkan tahap bunyi bising di persekitaran stesen kerja saya Organization strive to minimize the noise level in my workstation area.	1	2	3	4	5

<b>Pencahayaan/Lighting</b>						
1.	Tahap pencahayaan di ruang kerja saya memuaskan. The illumination at my work area is satisfactory	1	2	3	4	5
2	Organisasi menyediakan sistem pencahayaan yang fleksibel Organisation provides flexible lighting system	1	2	3	4	5
3	Cahaya lampu yang terang meningkatkan prestasi kerja yang saya lakukan The bright lighting increases my job performance	1	2	3	4	5



**SEKSYEN C: MASA BEKERJA***Section C: Working Hours*

<b>Sangat tidak setuju</b> <i>Strongly disagree</i>	<b>Tidak setuju</b> <i>Disagree</i>	<b>Kurang setuju</b> <i>Slightly disagree</i>	<b>Setuju</b> <i>Agree</i>	<b>Sangat setuju</b> <i>Strongly agree</i>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

1.	Tempoh masa bekerja yang ditetapkan tidak mengganggu kehidupan peribadi saya The fixed working hours does not effect my personal life	1	2	3	4	5
2.	Saya berpuashati dengan tempoh masa bekerja yang ditetapkan oleh Organisasi I feel satisfied with the working hours fixed by the organization	1	2	3	4	5
3.	Saya diberi rehat yang mencukupi dalam sesuatu tempoh masa bekerja I am given sufficient rest in a work hour period	1	2	3	4	5
4.	Jadual kerja saya sering bercanggah dengan kehidupan keluarga saya My work schedule often conflict with my family life	1	2	3	4	5
5.	Masa yang memerlukan saya memberikan tumpuan kepada tugas menyebabkan saya tidak dapat menjalankan tanggungjawab rumah tangga dan aktiviti lain dengan sama rata The time i must devote to my job keeps me from participating equally in household responsibilities and activities	1	2	3	4	5

**Section D: Work Load****Seksyen D: Bebanan Kerja**

<b>Sangat tidak setuju</b> <i>Strongly disagree</i>	<b>Tidak setuju</b> <i>Disagree</i>	<b>Kurang setuju</b> <i>Slightly disagree</i>	<b>Setuju</b> <i>Agree</i>	<b>Sangat setuju</b> <i>Strongly agree</i>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

1.	Saya mempunyai terlalu banyak kerja I have too much work	1	2	3	4	5
2.	Saya mempunyai masa bersendirian dan tidak diganggu I am able to have quiet and undisturbed time alone	1	2	3	4	5
3.	Saya mempunyai hanya sedikit sokongan untuk	1	2	3	4	5

	menyelesaikan masalah semasa kerja I have little support or network to solve work related problems.					
4.	Saya tidak mempunyai waktu kerja yang fleksibel I do not have flexible working arrangement	1	2	3	4	5
5.	Saya mempunyai terlalu banyak tugas yang perlu dilakukan dan tidak mempunyai masa yang cukup I am having too much to do and don't have enough time	1	2	3	4	5
6.	Saya mendapati kerja saya mengganggu masa lapang saya I find my work interfere with my leisure hours	1	2	3	4	5
7.	Terdapat tekanan yang berterusan dalam setiap minit bekerja dengan sedikit peluang untuk berehat There is constant pressure to work every minute with little opportunity to relax.	1	2	3	4	5
8.	Saya tertekan apabila memikirkan semua tugas yang memerlukan perhatian saya I get depressed when I consider all tasks need my attention	1	2	3	4	5
9.	Saya mendapat kesukaran dalam mencari masa yang cukup untuk berehat I find difficulty in finding enough time to relax	1	2	3	4	5
10.	Saya rasa saya mempunyai tanggungjawab yang terlalu banyak I feel I have too much responsibility	1	2	3	4	5

**SEKSYEN E: TEKATAN FISOLOGIKAL DI TEMPAT KERJA**  
**Section E: Physiological Stress in the Workplace**

<b>Sangat tidak setuju</b> Strongly disagree	<b>Tidak setuju</b> Disagree	<b>Kurang setuju</b> Slightly disagree	<b>Setuju</b> Agree	<b>Sangat setuju</b> Strongly agree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

1.	Sometimes I feel stress. Kadang kala saya merasa tertekan.	1	2	3	4	5
2.	I easily feel annoy/ irritate with my workstation environment. Saya selalu merasa menyampah/sakit hati dengan persekitaran tempat kerja saya.	1	2	3	4	5
3.	Work problems make me experience stomach upset. Masalah kerja selalu menyebabkan saya mengalami ketidakselesaan perut.	1	2	3	4	5
4.	I lost my appetite due to work problems. Saya hilang selera makan disebabkan masalah kerja.	1	2	3	4	5

5.	I do not have strengths to complete things I wish to do. Saya tiada daya untuk menyiapkan perkara-perkara yang dikehendaki saya.	1	2	3	4	5
6.	Work problems make my heart beat goes faster than usual. Masalah tentang kerja menyebabkan jantung saya berdenyut lebih kencang daripada biasa.	1	2	3	4	5
7.	I easily get tired at work. Saya mudah letih ketika bekerja.	1	2	3	4	5
8.	I feel burnout. Saya merasa tertekan.	1	2	3	4	5
9.	Tiredness due to work makes me depress and feel lazy to work. Keletihan akibat kerja menyebabkan saya tertekan dan merasa malas untuk bekerja.	1	2	3	4	5



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