

Healthful Workplace Facilities and Work Stress among Academic Staff of UiTM Jengka, Pahang

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ABSTRACT

In any organizations, a healthful workplace facility brings safety to employees' physical and mental capabilities especially in performing their daily routine works. In order to reach the healthful workplace, providing healthful facilities must be taken into account. For example, an efficient humidity and comfortable workstation could provide good working conditions to academic staff. A good working condition also creates enjoyment of working habits for the academics staff especially in situation before and after lecturing. From 204 number of population only 34 respondents from academic staff, UiTM Pahang responded and completed questionnaires comprised demographic section, work environment factors section and work stress section. The data was analysed using SPSS 20.0 for windows. Descriptive statistics and multiple regressions were used as the scale of measurements of this study. Results exhibited majority academic staff who responded was women at young age and worked for UiTM Jengka Campus less than five years and in rank of grade DM45 (Degree in Master holders). Results also showed the four workplace facilities have been provided by UiTM Jengka Campus towards its academic staff with mean more than 3.0. However, chair seating's mean is the lowest among them ($M = 3.338$). The workstation and chair seating were found as negative correlation and contributed significantly to work stress (54.2 percent). These findings demonstrated that work stress happened among academic staff in UiTM Jengka Campus in the context of lacking providing healthful workplace facilities. Work stress exists when there is discrepancy between working condition and human systems in workplace.

Keywords: *chair seating, illumination, humidity, workstation, work stress*

Introduction

The issue of workers' safety and health are the important aspects in ensuring workers' well-being in our organizations. The safety and health of workers are the organization's responsibilities. Even though Universiti Teknologi Mara (UiTM), Jengka Campus is a university offering less risk courses with its workers including lecturers are not facing high risk work or duty, yet the lecturers' safety must be taken into account. Their workstations, work designs and work environment must be pictured them as professional workers.

Ergonomic is the science and technology of fitting the activities and environment to the abilities, dimensions, and needs of people to improve performance while enhancing comfort, health and safety (Ashraf & Mahmoud, 2007; Salvendy, 2001). It is also to design and to ensure employees' safety while working and reduce office hazards such as carpal tunnel syndrome (CTS) and fatigue. Other than that, ergonomic is a scientific discipline concerning with the understanding of interactions among humans and other elements of a system (Md Sirat, Mohamed, Syed Hassan & Zakuan, 2012; Vink, Emada & Zink, 2008) and it will contribute to work stress if it is ignored. This work stress can be seen when workers easily get tired at work, depressed, lazy to complete work, and easily get irritated.

The elements of a work system, such as the worker, equipment, environment, task, and organization interact when work is performed (Ashraf & Mahmoud, 2007). The same goes with ergonomic elements such as lighting, humidity, and work station in which each of them interacts with each other in supporting workers' work completion. The objectives of this study were:

1. to determine whether the ergonomic facilities are provided by UiTM Jengka Campus to the academic staff,
2. to determine the relationship between ergonomic facilities and work stress among UiTM Jengka Campus academic staff.

Literature Review

Previous studies have shown that the poor practice of ergonomic in workstations will contribute to the stress problems among workers. They also explained that when employees are working at improperly designed workstations, muscle fatigue, eyestrain, headaches, and other discomforts can become factors in decreasing the effectiveness of the organization. These situations ended with stress and influence the level of job performance. As a consequence of this work stress, worker's productivity will be affected. So, an organization should provide a comfortable and appropriate working environment facility that suits humans' needs ergonomic facilities or workstation. These facilities or ergonomic workstation should incorporate with the elements of human factors design. They should be according to the Occupational Safety & Health Administration (OSHA) compliant. Thus workers can proceed with their working life in the office without any pain; stress and improve the organization productivity.

According to Hope (2009), Zafir, Durraishah, & Mat Rebi, (2007) and Mustafa (2007), ergonomic and human factors are terms often used synonymously. Both describe the interaction between the worker and the work interface and concerned in trying to reduce work stress in the workplace. Many studies have investigated the facilities of ergonomic such as chair seating, lighting, humidity and working hours, workstation and others (Zafir, 2012; Zafir, Syed, Shaza & Norliza, 2011; Zafir and Durrishah, 2009; Harel, 2008; Zafir, Durraishah, & Mat Rebi, 2008; Zafir, Durraishah, & Mat Rebi, 2007; Mustafa, 2007). From the previous studies we can conclude that, workstation, chair seating, lighting and humidity are among facilities that the company put less into account in designing their office. Therefore, workstation, chair seating, lighting, and humidity are the ergonomic factors that will be examined in this study in their relation to work stress.

Workstation

Workstation is where all works get done. Most people who work in an office would agree that a workstation will influence the comfortability of employees, work stress and thus job performance. Most of workstation consists of a desk, a chair, a computer and shelves. However, this workstation does not consider the ergonomic factors such as amounts of space, arrangement of furniture, storage capacity and of course ergonomic furniture.

A research done by Zafir, Syed, Shaza and Norliza (2011) stated that in their analysis, 47.2% of the stress outcomes changes are due to the ergonomic workstation factors. They suggest that an organization should provide a comfortable, suitable arrangement of workstations and also improving the employee's work flow, have comfortable and suitable arrangement and applying new ergonomically designed working chair in order to avoid congestion and work stress at workstations. This is supported by Zafir and Durrishah (2009), who found that the all ergonomic factors including workstation have significant relationship with work stress at workplace. They further found that, when employees feel stressed, the feeling of dissatisfaction, complaints and intention to quit start to arise.

Chair Seating

Today, most of the time people sit in handling their daily activities. They sit while having breakfast, in classrooms, in meetings, in offices, during dinner and at home while watching television. Although sitting requires less physical effort than standing or walking, it puts a lot of stress on lumbar area. Combined effects of a sedentary lifestyle and a job that requires sitting can lead to many health problems. The prolonged use of chair without a comfortable one will bring hazard to them. An ergonomic seating refers to chairs that are designed to provide comfort to the user when they are working. Using an ergonomic chair, will make people work with the least amount of tension and stress on their bodies.

According to Harel (2008) one of the most important features of an office is the chair. The researcher also explained every office should have ergonomic office chairs so that every person will be able to make the necessary adjustments to comfort him/herself. It follows the study done by Chelsea (2010), which explained that chairs that do not properly meet the needs of the user's body may cause back pain, eye strain from not being properly positioned in front of the computer screen, fatigue from poor circulation and numerous other health issue. According to Zafir and Durraishah (2009) and Beckett (1995), the physical problems associated with prolonged use of the poor office seating do not end with the twinge discomfort. However, they can easily extend to repetitive strain injury (RSI) causing chronic or permanent damage.

These injuries may cause higher costs to the organization because the workers who suffer from these injuries will take a long time to get back to work. Thus, it will result a higher medical and time loss payments. In addition, while the symptom of RSI is developing, there can be higher hidden costs since workers will use more sick leaves and slow their work pace or productivity.

Ergonomic chairs are specifically designed to suit to a range of people. Many people have mistakenly purchase an ergonomic chair just simply because there are labeled ergonomic. A chair become ergonomic when it suits with the worker's body size, his workstation and the task he performs. The best ergonomic chair should follow certain criteria. It should be adjustable where the worker can adjust the height of chair according to his/her needs. Besides, it should have a backrest which can be adjusted both vertically and frontward and backward direction. Lastly, the best chair should be stable for a worker to use it for the whole working day. By having an ergonomic chair, basically it should bring easiness and comfort position to a worker. A well-designed chair allows the user to sit in a balanced position. However, expected outcomes may also happen because the actual positions depend on individual habits. Some people tend to bend forward and down or sit with shoulders hunched. So, to make sure an ergonomic chair gives the best result, it depends on that individual to learn how to sit properly.

Lighting

Normally, people will take lighting system lightly. Most ergonomist rank lighting to be one of the top three items to be concerned in designing a healthy working environment. If we look around, most offices which have lighting problems are due to flicker and hum of old electro-magnetic ballasts, glare on monitor and over lit office or excessive background light. The gloomy, dull and dark working place will result in eye strain especially when the workers are working with paper. In contrast, over lighting working place will bring other problem, where the workers have to glare to their work because of excessive lighting in the place. Windows and direct sunlight can create this problem because it gives more light than a working place should be.

This unfavorable situation will force worker's eyes to readjust when their sight moving from one light level to the other. If the situation keeps on continuing, it will lead to some typical health related symptoms such as headaches, indigestion, nausea, blurred or double vision, flickering sensations, itching and burning eyes, tension, and vision fatigue. As a result of suffering from all these injuries, worker will start to feel stress and slowly their productivity will decrease and finally a return or profit of an organization will be affected. Therefore, an organization should provide and monitor the best lighting system for the workplace. The best lighting system will allow workers to see and work productively in best condition where fatigue and stress are reduced (Harel, 2008).

The amount of light falling on a surface is measured in units we called as lux, lux refer to lumens (quantity of light) per square metre. As we refer to the factors above, an adequate general lighting is usually between 500 and 1000 lux when measured 76 cm (30 inches) above the floor. According to the Illuminating Engineering Society of North America (IESNA), the recommended light levels are as in the following table.

Table 1.1: Recommended Illumination

Recommended Illumination levels	
Type of Activity	Ranges of Illuminations (LUX)
Computer only	300 - 500
Computer and paper document	500 -750 (with supplementary lighting)
Paper document only	750 - 1000

As shown in the above table, if the nature of task is using papers, the lighting should be more than computer base task. It is due to the fact that, the computer itself already has its own light, while paper depends on surroundings light. The Light levels for computer use should be lower than those for reading from paper documents. Using computer will need lighting which is similar to the amount of the light of the monitor screen. If the space behind or beside the monitor are lighter, it will annoy the worker and their attention may be distracted.

According to Occupational Safety and Health Administration (OSHA), a study in United State (U.S.) has estimated that 90% of the U.S. workforce using computers for more than 3 hours per day will

experience computer vision syndrome (CVS). As a result it will bring the work stress to the workers. This is consistent with the study done by Zafir, Durrishah and Mat Rebi (2007) and Sutton and Rafaeli (1987) which found that the high level of glare, lack of natural light, and level of lighting that are too low for a given task will have negative effects on the outcomes of the organizations. The study also said that it is difficult to make specific statement about the best level of lighting since their appropriateness depends heavily on the nature of a task.

Therefore an organization which is concern about their profit should consider the best lighting system as the first thing when they set up the workplace. The best lighting system will contribute to the organization. Zafir, Durrishah and Mat Rebi (2007) and Wojcikiewicz (2003) explained that workplace lighting contributes to the increase of workers capability and fatigue minimization. And other research also found a negative relationship between darkness and employee's reactions including job satisfaction and well-being (Oldham and Rotchford, 1983).

Workers who are more satisfied with their lighting system in the workplace will feel their place as more attractive and are more comfortable and thus they are happier and satisfied with their environment and their work. Thus, they will feel motivated to complete their task successfully with the best environment they have.

Humidity

Malaysia is a hot and humid tropical country and the humidity becomes lower and temperature become higher at daytime. Thus, a good organization should provide comfortable environments which have suitable humidity, temperature, air speed and balanced heat. Humidity is an important element that an organization should consider for a comfortable working environment. Humidity refers to the amount of water vapour in the air. Meanwhile, water vapour is the gas phase of water and it is invisible. Higher humidity reduces the effectiveness of sweating in cooling the body by reducing the rate of evaporation of moisture from the skin.

Thus, air conditioner is the most obvious equipment that can help workers to cool down when it is unbearably hot outside. This idea is agreed by Ismail, Jusoh, Zulkifli, Sopian and Deros (2009), who mentioned that, in the situation of hot and humid country like Malaysia, air conditioning during office hours is a must if people want a comfortable working environment in the building space during the day. They found that, the working environment with high temperature was considered a great factor that would influence the acceptability and performance of worker especially in the indoor building occupants. In other words, companies with higher health, facilities and environmental problems could face more performance problem and high absenteeism. Further research by Zafir, Durrishah and Mat Rebi (2007) also stated that air quality is a very important factor in determining organizational comfort level. Poor indoor air quality has a direct impact on health problems and leads to uncomfortable workplace environment.

Shikdar and Swaqed (2003) also found that 94% of the companies that had been studied in selected industries in Oman did not carry any ergonomic assessment. This poor health facility condition, especially a hot environment (54% of the company has suffered from this condition) has contributed to the accidents and injuries and thus affects workers performance.

As stated by Siti Zawiah and Zahari (2006), the environmental factor does affect job satisfaction. The environmental factor here includes the air temperature and humidity. They believed that discomfort feeling arises from the un-evaporated sweat or from the existing of high temperature will lead to the feeling of job dissatisfaction.

Work Stress

According to White (1999), physical ergonomic deals with the human body's responses to physical and physiological stress. Stress could be positive or negative, depending on how the worker perceives the stress. Stress is not inherently deleterious however it is individual cognitive appraisal that gives perception and interpretation, give meaning to events and determines whatever events are viewed as threatening or positive (Jennings, 2008). An individual could experience stress if he/she perceives negatively towards his/her work environment (Zafir & Durrishah, 2009). Other than that, stress is also known as the cause of mental health problem which the latter could affect the industry's management course (Cooper & Marshall, 1976).

Works stress is recognized worldwide as a major challenge to workers, health and the healthiness of their organization (Leka, Griffiths & Cox, 2003; International Labor Organization, 1986). According to previous researchers the factors in the workplace that have been identified to be associated with stress and health risks can be categorized into those related to the content of work and those related to social and organizational context of work (Swee, Anza & Noor Hassim, 2007).

According to Mika, Paivi, Ritva, Hilkkka, Jussi and Juhani (2002) a job strain (which happens due to high demands and low job control) and effort-reward in balance (high demands, low security, and few career opportunities) could draw out stress at work. The researchers also added employees who do not change their job or workplace for quite some time are more likely in stable level of work stress. Park (2007) also stated job strain is the only one stressor workers may face at the workplace. According to Jennings (2008), work stress on occupations continues to be his interest other than healthcare. His study focused on work stress and burn up that influenced the work environment and working condition. From his study work stress can contribute to absenteeism and turn over, both of which detract from the quality of care. By turning toxic work environments into healthy work places, Jennings (2008) believes that environment can affect worker's outcomes.

Methodology

The population and sample size were determined by the number of academician (lecturers including senior and young lecturers) working in UiTM Jengka, Pahang, which was 431. Based on the number of population, the sample size was 204 according to Krecjie and Morgan (1970). Since there were 14 faculties and academic centres, therefore, the sample size of 204 was divided into 14 (faculties and academic centres) with around 14 to 15 respondents for each faculty and academic centre. However, only 34 responded over 204 potential respondents which were 17%. In order to collect data, simple random sampling technique was used.

In order to collect data, a set of questionnaire was used. The questionnaires were developed by adapting questions that has been used in previous research. The adapted questions were related to ergonomic and work stress. The questionnaire was divided into three sections, Section A, (demographic background of respondent), Section B (facilities of office ergonomic) and Section C which examined work stress faced by the respondents. Section A consists of items related to demographic background of respondents such as gender, age, level of education, year of service, faculty/academic centres, position, and category of position grade. Section B contains items related to ergonomic factors which included illumination, chair seating, humidity, and workstation. All items were adapted from a research done by Zafir and Durrishah (2009). In Section C, the questionnaire lists the statements considered symptoms of work stress. All items also were adapted from research done by Zafir and Durrishah (2009). Every question in Section B and C used 5-point Likert scales in which, being (1) Strongly disagree, (2) Disagree, (3) Natural, (4) Agree, and (5) Strongly agree. Several questions were negative items and had gone through coding process and reversed into positive items.

The questionnaires were distributed randomly to respondents who were working as lecturers in UiTM Jengka Campus. The sampling technique used was simple random sampling. In order to make sure the questionnaire collected correctly and fully, the researcher gave one week for respondents to answer the questions. Another week was used to collect the questionnaire.

The data of questionnaire was analysed using SPSS 20.0 for windows. The scale of measurements used for measuring Research Question 1 (What are the ergonomic facilities provided by UiTM Jengka, Pahang to the academic staff?) and Research Question 2 (Do the ergonomic facilities contribute significantly to work stress?) were Descriptive statistics and Multiple Regression. The descriptive statistics was also used to determine items in Section A: Demographic Background of respondents.

	Frequency	%
Gender		
Male	5	9.4
Female	29	54.7
Age		
22 - 29 years old	16	30.2
30 - 39 years old	9	17.0

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40 - 49 years old	7	13.2
More than 50 years old	2	3.8

Level of Education

Bachelor Degree	2	3.8
Master	30	56.6
PhD	2	3.8

Years of Service

Less than 5 years	23	43.4
5 - 10 years old	6	11.3
11 - 15 years old	4	7.5
More than 16 years	1	1.9

Faculty/Academics Centers

Accounting (Accounting/Laws)	2	3.8
Applied Sciences (Biology/Chemistry/Physics)	2	3.8
Applied Sciences (Wood Technology)	2	3.8
Academy of Language Studies	5	9.4
Business Management (Banking)	5	9.4
Business Management (Business)	2	3.8
Business Management (Economy)	3	5.7
Business Management (Office Management and Technology)	10	18.9
Computer and Mathematical Sciences (Mathematics/Statistics)	3	5.7

Position

Head of Centre of Studies	1	1.9
Course Coordinator	3	5.7
Other Coordinator	1	1.9
Senior Lecturer	2	3.8
Lecturer	21	39.6
Contract Lecturer	1	1.9
Temporary Lecturer (Full-time)	5	9.4

Category

DM52	4	7.5
DM45	27	50.9
DM41	3	5.7

A pilot study was run involving 40 respondents who also worked in UiTM Jengka Campus as academic staff. These respondents were excluded in the next distribution of questionnaire since they were tested in pilot test. Based on the results of pilot study, some of the questionnaire's items were dropped and changed to achieve validity and reliability. Below is a table that shows the overall alpha coefficient for 40 items researched is 0.914, suggesting that the items were highly correlated and had internal consistency.

Table 1.2: Reliability Statistics

Cronbach's Alpha	Number of Items
.914	40

Results and Discussion

Table 1.3: Respondents' Demographic Information

According to Table 4.6.1, the majority of respondents were women (54.7%) since this gender was the majority in UiTM Jengka Campus. 30.2% of the respondents were young academic staff at young age (22 – 29 years old), holding a Master's Degree which was 56.6%. These results were parallel with their years of service which most of them (43.4%) have worked for UiTM Jengka Campus for less than five years.

There were four faculties and one academic centre that did not respond to the questionnaires. There were Centre of Islamic Thought and Understanding, Faculty of Civil Engineering, Faculty of Computer and Mathematical Sciences (Computer Sciences), Faculty of Plantation and Agrotechnology, and Faculty of Sport Science and Recreation. The highest respondents were from Faculty Business Management (Office Management and Technology) with 18.9%. 39.6% of the respondents were in position of lecturer which most of them were in category of grade DM45 (50.9%). There were no assistant lecturers involved in this study since there was no response from them.

Mean and Standard Deviation Analysis

Table 1.4: Descriptive Statistics for Ergonomic Facilities (n=34)

	Min	Max	Mean	S. Deviation
Illumination	2.00	5.00	3.7059	.66040
Chair Seating	1.25	5.00	3.3382	1.04787
Humidity	1.75	5.00	3.5368	.66325
Workstation	1.00	5.00	3.5980	1.12450

Three of four ergonomic factors which were illumination, humidity and workstation were perceived as ergonomic facilities in UiTM Jengka Campus. This situation is based on the results displayed in Table 4.6.2. Their mean were more than value of 3.5 which were 3.706 (SD = 0.660), 3.537 (SD = 0.663) and 3.598 (SD = 1.125) respectively. However, chair seating was less perceived, as its mean was 3.338. This result can be seen in detail at Table 4.6.3 that indicates reasons why the mean for chair seating was below 3.50. Based on the table, chair seating's mean was 3.30 for "I can adjust my working chair easily" (M = 3.147, SD = 1.282), "My working chair is adjustable into various positions" (M = 3.029, SD = 1.381), and "My working chair is comfortable" (M = 3.41).

Table 1.5: Descriptive Statistics for Chair Seating (n=34)

	Min	Max	Mean	S. Deviation
I can adjust my working chair easily.	1.00	5.00	3.1471	1.28234
My working chair is adjustable into various positions.	1.00	5.00	3.0294	1.38138
My working chair is comfortable.	1.00	5.00	3.4118	1.10420
The working chair provided is suitable with my work.	1.00	5.00	3.7647	.95533

Multiple Regressions Analysis on Ergonomic Factors and Work Stress

Table 1.6: Multiple Regressions

Work Stress	= 4.927 (12.469)***	-0.538 Workstation (-4.053)***	-0.330 Chair Seating (-2.488)**
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Notes: Figure in () denote t-stastical value and *** and ** denotes significance level at 1% and 5% level, respectively

It was found that workstation and chair seating is negatively related and contributed significantly to work stress. The better of ergonomic design apply in the workstation and chair seating, the lower work stress faced by academic staff of UiTM Pahang. This result corresponds to a study done by Zafir, Syed, Shaza and Norliza (2011) and Zafir and Durrishah (2009).

Among all four ergonomic factors have been studied, we can concluded that only workstation and chair seating are do have significant relationship with work stress in UiTM Pahang. Most academicians in UiTM Pahang feel that the workstation is important factor that can contributing to the work stress maybe because, the limitation availability of proper workstation exist in this organization. There were some respondents who had not been given proper workstation to complete their daily work routine. In addition to that, it will affect the chair seating too since a proper workstation should have a proper chair seating. Thus, in order to increase the productivity level and reduce the work stress of of academic staff, a suitable, comfortable and ergonomic design of workstation and chair seating must be taken into consideration by UiTM Jengka Campus.

Table 1.7: Multiple Correlation Coefficients R and Other Statistics

R	R Square	Adjusted R Square	Std. Error of the Estimate
.737 ^b	.542	.513	.57667

The model can be considered as best fit model because of significant value in the ANOVA table. R Square is a statistic that explains the goodness of fit of a model. In regression, the R Square measures how well the regression line approximates the real data points. If the value of R Square is 1, it indicates that the regression line perfectly fits the data. For this study, R Square in table 4.6.5 below is 54.2% and it still can be considered strong.

Conclusion and Recommendation

Stress could happen to anyone, regardless of their age, gender, position, and level of education. In this study, stress was perceived negatively as the academic staff realized their working environment had less ergonomic characteristics. In this study, there were 34 respondents, who worked as academic staff in UiTM Jengka Campus. They were young female lecturers with less than five year-working experience. Most of them were holders of Master's Degree. They experience work stress at the very young age.

There were four Faculties and Academic Centres that did not involve in this study due to their working environment being perceived as in good condition. This indicates they did not experience negative stress like the other faculties and academic centres in UiTM Pahang. Office Management and Technology from Faculty of Business Management showed the highest (18.9%) in terms of work stress experienced. Even though this department showed the highest percentage, the solution to the problem should be applied for all other faculties as to ensure all the academic staff benefit from the ergonomic facilities.

Stress is a result of the discrepancy between the demands of the environment and the ability of the individual to adapt to it (Zafir, Durrishah & Mat Rebi, 2007). The demand of the environment may come from sufficient illumination, proper workstation, comfy chair seating and good humidity. Based on the mean and standard deviation analysis, four ergonomic facilities tested, only illumination, humidity and workstation were agreed to be well-provided. In terms of chair seating, the academic staff stated they cannot adjust their working chair easily, the working chair were not adjustable into various positions and were not comfortable enough. Comfortable working chair plays important role in supporting workers' body while working and indirectly reduces stress of their body. Ergonomic chairs are specifically designed to minimize strain on the

body and prevent pain from occurring, as well as other health related problems commonly associated with poor sitting posture (Chelsea, 2010).

It had been proven that chair seating was one of ergonomic factors contributed to work stress. As expected, workstation was also one of the factors leading to work stress. This finding supports Zafir and Durrishah (2009), which stated that ergonomic workstation could minimize the stress problem at the workplace. Before there will be an academic staff who intended to quit from UiTM Jengka Campus or asked for transfer to other UiTM branches, UiTM Jengka Campus should improve and provide good ergonomic facilities. Staff's productivity and creativity come from healthy working environment.

Future research

For future research, researchers would like to suggest a few recommendations:

1. The research should be done at other UiTM branches for comparison and evaluation of ergonomic facilities provided.
2. The variables (ergonomic facilities) of the research should be added and be examined thoroughly.

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