

## Workplace Environment Towards Health and Performance

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**Abstract:** The workplace environment is a significant aspect in discussing performance and health of human resources in an organization. An optimal workstation design is where the workplace environment supports the needs of the workers and where a worker operates in a conducive environment to the individual's abilities. The common features of the industries now-a-days are improper workplace design, ill-structured jobs, mis-match between worker abilities and job demands, adverse environment, poor human-machine system design and inappropriate management programs. These conditions lead to workplace hazards, poor workers' health, disabilities and will reduction in workers' productivity and products' quality. Designing the workplace environments with a firm's understanding of ergonomics can produce huge benefits. The payoffs come in terms of reduced costs for compensation and insurance, increased productivity and enhanced employee morale. Even more important, it can help employees to avoid injuries that cause pain and at the same time improve the health outcomes. Musculoskeletal Disorders (MSDs), the main threat of occupational health can be minimized by the implementation of effective ergonomics programs. Based on these circumstances, the objective of this research is to look into the respondents perception towards the workplace environment. Besides that, this research also looks into the gender influences in reporting musculoskeletal problems. A total of 61 non-managerial workers participated in the study. Further, t-test, ANOVA and Chi-square were performed to test the hypotheses.

**Key words:** Workplace, human resources, organization, MSDs, environment, productivity

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### INTRODUCTION

With the changing social information technology and more flexible ways of organizing work processes, the work environment of office workers has changed substantially in the last decades. The changing nature of the office worker's environment is exemplified by the growing number of organizations that move from conventional offices with fixed workplaces to more open and transparent offices with shared workplaces (Vos and van der Voordt, 2001). The introduction of work station design concepts may allow organizations to save office space, reduce general and technical service costs and increase flexibility of office use. An optimal workstation design is one where the workstation environment supports the needs of the workers and where a worker operates in a conducive environment to the individual's abilities. Innovative work station will allow sharing of information and networking regardless of the job-level boundaries, allow spontaneous communication, stimulate thinking and creativity (Stallworth and dan Kleiner, 1996).

Boles *et al.* (2004) suggested that performance on the job is higher when employees are physically and emotionally able to work and have desire to work. This leads to reduced absenteeism and job dissatisfaction but

improved performance. Higher level of performance leads to higher levels of corporate productivity which in turn guides to higher profits. Employees who report discomfort and dissatisfaction at work will have their productivity affected because being too hot, too cold, too draughty or harassed through lack of privacy or distraction will affect their ability to perform their work properly (Leaman, 1995). Improving worker productivity, occupational health and safety are major concerns of industry, especially in developing countries. However, these industries are featured improper workplace design, ill-structured jobs, mismatch between worker abilities and job demands, adverse environment, poor human-machine system design and inappropriate management programs (Shikdar and Sawaqed, 2003). These conditions leads to workplace hazards, poor worker health, disabilities and will reduce workers' productivity and products' quality. Work injuries create significant economic and humanitarian consequences to the society. Furthermore, work injuries have been associated with psychological distress, decreased participation in daily living activities and negative effects on family well-being (Kirsh and dan Mckee, 2003).

Research done by Ettner and Grzywacz (2001) showed that the work environments are associated with perceived effects of work on health. This research used a

national sample of 2,048 workers who were asked to rate the impact of their job on their physical and mental health. Regression analyses proved that the workers' responses were significantly correlated with health outcomes. In addition to this, Shikdar and Sawaqed (2003) pointed out that there is high correlation between performance indicators and health, facilities and environmental attributes. In other words, companies with higher health, facilities and environmental problems face more performance related problems such as low productivity and high absenteeism.

Many research have shown positive effects of applying ergonomic principles in workplaces, machine design, job design, environment and facilities design (Burri and Helander, 1991; Resnick and Zanotti, 1997; Rayan, 1989). The ergonomically work station design may affect office workers' health as well as their performance. Workstation design from an ergonomics perspective can effectively enhance productivity and minimize stress by considering the interaction between the various system components (Dempsey *et al.*, 2004). In addition, DeRango (2003) stated that ergonomic interventions in workplace environment can lead to lower pain levels and increased productivity among office workers. Ergonomics is the design of the workplace, equipment, machine, tool, product, environment and system, taking into consideration the human's physical, physiological, biomechanical and psychological capabilities and optimizing the effectiveness and productivity of work systems while assuring the safety, health and wellbeing of the workers (Fernandez, 1995). Ergonomics is the science of designing the job to fit the worker, rather than physically forcing the worker's body to fit the job. If work station designs do not include ergonomic principles in their design, workers may have exposure to undue physical stress, strain and overexertion including vibration, awkward postures, forceful exertions, repetitive motion and heavy lifting.

Ergonomic design workstation simply refers to minimizing the amount of energy expended during the completion of any given task. In terms of everyday office use, an ergonomic chair is one which not only allows the user to complete tasks but also actively facilitates this completion. The work chair shall be stable and allow the operator or user move easily and sit in a comfortable position. Furthermore, the seat shall be adjustable in height and tilt. To maximize comfort when leaning backwards, the seat should remain stationary and the feet remain flat on the floor, so as not to inhibit circulation (Beckett, 1995). For a chair to be ergonomic, it has to have at least vertically adjustable. In offices, ergonomics has relevance not just to furniture choice (chairs and desks) but also to communications within the workplace,

teamworking, hot desk policies, layout, lighting, noise control and many other aspects of the working environment (Brooks, 1998). Office acoustics also effect employee health and safety. Many studies acknowledge, that noise is a known cause of stress. Stress causes health problems such as high blood pressure, digestive disorders, headaches, hypertension and ulcers.

**Hypotheses development:** Ergonomics is a basic understanding of how this science applies to fit the physical aspects of the work environment to the human body. People come in all shapes and sizes with varying capabilities and limitations in strength, speed, flexibility and skills. All of these factors need to be taken into consideration for appropriate workplace design and function. When the physical environment is not suited to the physical capacity of the person to perform required tasks, Musculoskeletal Disorders (MSDs) can result. According to De Croon *et al.* (2005), the work station design may directly or indirectly result in physiological and psychological reactions such as crowding stress (Psychological state of inadequacy of space, occupationally induced fatigue, job satisfaction and increased levels of blood pressure). In addition, the long term reactions include decreased performance (Cotton and Hart, 2003) and negative health outcomes such as psychosomatic health complaints including chronic fatigue, burnout and musculoskeletal disorders (De Lange *et al.*, 2002; Sluiter *et al.*, 2003).

Musculoskeletal Disorders (MSDs) are injuries and disorders of the soft tissues (Muscles, tendons, ligaments, joints and cartilage) and nervous system. Occupational safety and health professionals have called these disorders a variety of names including Cumulative Trauma Disorders (CTD), Repetitive Stress Injuries (RSI), repeated trauma injuries, Work-related Musculoskeletal Injuries (WMSI) and occupational overexertion syndrome (U.S. Department of Labor, 2000). Occupational Safety and Health Administration (OSHA) defines Musculoskeletal Disorders (MSDs) as an injury or disorder to muscles, tendon, ligaments, joints, cartilage and spinal discs. Risks for the potential development of MSDs are identified as repetitive and forceful exertions, exposure to vibration, frequent or heavy lifting, pushing, pulling or carrying, prolonged awkward positions, prolonged hours of computer use, contact stress and work organization (Martin *et al.*, 2003). MSDs labeled as the fastest growing workplace illness are responsible for >60% of all workplace injuries in USA (Attaran and Wargo, 1999). Besides that, Punnet and Wegman (2004) reported that in the United States, Canada, Finland, Sweden and England, musculoskeletal disorders cause more work absenteeism or disability than any other group of diseases.

For computer users, eye strain is the most common complaint. Some symptoms of eye strain include burning, itching, watering and blurry vision (Cooper and Kleiner, 2001). This can lead to headaches, fatigue, concentration difficulties and irritability. Research performed by Jensen *et al.* (2002) on 2579 full time working employees showed that working almost the whole working day with a computer was associated with neck and shoulder symptoms among women and hand symptoms among men. The advent of computer technology has meant greater flexibility and increased efficiency for office workers but has resulted in a range of health problems such as carpal tunnel syndrome, cumulative trauma disorders and repetitive strain injuries caused by inadequate workstation design (Attaran and Wargo, 1999). Additionally, musculoskeletal injuries associated with computer use account for at least half of all reported work-related injuries (Bohr, 2000). Bohr (2000) found out that with the increased use of computers at work sites, the number of injuries and their associated costs will continue to rise.

The physical problems associated with prolonged use of office seating do not end with the odd twinge discomfort. Moreover, they can easily extend to Repetitive Strain Injury (RSI) causing chronic or permanent damage (Beckett, 1995). Repetitive motion can result in the tightening of muscles, inflammation of tissues or displacement of the nerve itself, in turn, cause in nerve compression or nerve entrapment (Martin *et al.*, 2003). Research done by Shikdar and Sawaqed (2003) found that 54% of the managers reported hot environmental conditions, 28% a noisy environment and 26% a lack of resources and facilities. Managers received workers' complaints of fatigue, back pain, upper-body pain, hand and wrist pain and headaches.

A survey, conducted to 169 workers with injuries to their lower back or upper extremity, found that over half the sample experienced decreased participation in activities of daily living (Pransky *et al.*, 1999). Similar result has been produced by Welch *et al.* (1999) in their study of construction workers with musculoskeletal injuries. Results revealed that one quarter of the sample experienced persistent physical symptoms which resulted in major or substantial changes in the ability to carry out personal or household activities. Low back pain is amongst the most prevalent somatic complaints (Gheldof *et al.*, 2005). Chronic low back pain tends to alter daily performance in activities of daily living (Bowman, 1991) as well as high rates of depression (Hitchcock *et al.*, 1994) and changing family and personal relationship (Strong *et al.*, 1994). Typically, pain becomes progressively severe and lost of function occur. The pain and disability may persist for many years and in some cases become intractable. In reality, repeated neck, shoulder and arm symptoms can be more efficiently

reduced if ergonomic measures to improve the work environment are combined with changes in work techniques (Nevala-Puranen *et al.*, 2003).

In developed economies, the relationship between work and health is changing for both men and women. Strazdins and Bammer (2004) pointed out that now-a-days, most women are in paid employment and the nature of work itself is changing. These social changes are likely to affect both men's and women's lives but in differing ways. According to Strazdins and Bammer (2004), women's propensity to report musculoskeletal problems more than men due to the different demands that they face at work and at home. At work, women spend more time using computers, do more repetitive movements and report poorer and less comfortable equipment. Outside of work, women bore the brunt of the unpaid work involved in parenting and to accommodate the time squeeze, cut back on their exercise and relaxation. Actually, the 10 most discriminative complaints stated more often by females such as tears when excited, cold hands, a tickle in one's throat, dry skin, flatulence, constipation, trembling when excited, blushing, headaches, susceptibility to the weather as well as somatic reactions when excited (Fahrenberg, 1995). Employed women are two to five times more likely than men to report these sorts of problems (Strazdins and Bammer, 2004). Landau *et al.* (1996) revealed that sitting postures predominate among women whereas standing postures are more frequently encountered in male-occupied jobs. Furthermore, exposure to noise continues to rate highly among physical environmental factors and this is more prevalent in male-occupied jobs. According to Fillingham *et al.* (1999), women appear to be more sensitive to pain and consistently report greater pain when it is experimentally induced. Furthermore, pain sensitivity varies across stages in the menstrual cycle suggesting that sex-linked hormones are involved in pain perception. In conjunction with this finding, women indicated significantly higher levels of job stress than men. Women reported significantly higher levels of psychological symptoms than men but the two groups reported similar emotional and physical health (Burke, 2002).

The objective of this research is to look at the respondents view related to the workplace environment such as environment, work station design and communication. Moreover, this research also looks into the perception of respondents towards the workplace environment. In addition to these objectives, researchers also look into the gender influence in reporting musculoskeletal problems.

## **MATERIALS AND METHODS**

Questionnaires were distributed to 70 Bachelor of Business Administration Executive (BBA) students in

UKM. Most of the BBA students are non-managerial workers. They are working in various organization and most of them are in private organization. Respondents were given 15 min to complete the questionnaire. The data was summarized for subsequent analysis. After a thorough review, only 61 questionnaires could be used for further analysis.

For this research purposes, the workplace environment was defined by three factors, i.e., environment, workstation design and communication. All 26 items in the questionnaire have been adapted from the research done by Sutton and Rafaeli (1987), Dua (1994), Rowan and Wright (1994) and Bohr (2000). Cronbach's alpha for these 26 items is 0.704.

About 19 illnesses and health problems have been classified into four categories, i.e., upper extremities, lower extremities, lower back and others (Goetsch, 2002). The questionnaire has been analyzed and the information has been presented in descriptive manner such as frequency tables and cross-tabulations. For hypotheses testing, Chi-square and ANOVA have been administered. The hypotheses of this research are:

**Hypotheses 1**

**H<sub>0</sub>:** There is no difference in the perception towards the workplace environment between male and female

**H<sub>a</sub>:** There is difference in the perception towards the workplace environment between male and female

**Hypotheses 2**

**H<sub>0</sub>:** There is no difference in the perception towards the workplace environment between the five groups of respondents

**H<sub>a</sub>:** There is difference in the perception towards the workplace environment between the 5 groups of respondents

**Hypotheses 3**

**H<sub>0</sub>:** The illness experienced is independent of gender

**H<sub>a</sub>:** The illness experienced is dependent of gender

**Data analysis:** Descriptive statistics (i.e., frequency and percentage) were computed to gain an understanding of respondents' demographic factors. Further, t-test, ANOVA and  $\chi^2$  were performed to test the hypotheses. The alpha level for all hypotheses testing is 0.05. t-test was conducted to investigate the differences cause by respondents' gender in the perception towards the work environment. The variables of workstation design (9 questions), environment (10 questions) and communication (7 questions) were added up to form a new variable, that is work environment. ANOVA procedure was used to examine the perception towards the work environment between the five groups of respondents (Grouping of respondents was based on the number of illnesses category they experienced). Lastly, the

Chi-square ( $\chi^2$ ) was conducted to study the effect on gender towards the illnesses experienced by the respondents.

**RESULTS**

Table 1 provides the details of the respondents' demographic factors such as their gender, age, race and marital status. The sample is inclusive of 32 male and 29 female. They are at about 25 to late 40s. The oldest respondent is 49 years old. Most of them are Malay (93.4%) and married (72.1%).

Table 2 illustrates the illnesses category. About 48 out of 61 respondents complained that they experienced several illnesses as they work with their organizations. To investigate the type of illnesses they encountered, a cross tabulation was administered (Table 2). From the analysis, the researchers found that the most frequent illness reported by the sample is the upper extremity category (48 cases, with 26 cases for male and 22 cases for female). This category of illness inclusive of headaches, eye strain, chest pain, shoulder pain, etc.

Table 3 illustrates the frequency of the illnesses category experienced by the respondents at one time. From the cross tabulation, researchers also found that the respondents majority would suffer from two categories of

Table 1: Respondents' demographic information

| Demographic variables | Frequency | Percentage |
|-----------------------|-----------|------------|
| <b>Gender</b>         |           |            |
| Male                  | 32        | 52.5       |
| Female                | 29        | 47.5       |
| <b>Age category</b>   |           |            |
| <25                   | 10        | 16.4       |
| 26-30                 | 15        | 24.6       |
| 31-35                 | 17        | 27.9       |
| 36-40                 | 15        | 24.6       |
| >41                   | 4         | 6.5        |
| <b>Race</b>           |           |            |
| Malay                 | 57        | 93.4       |
| Chinese               | 3         | 05.0       |
| Indian                | 1         | 01.6       |
| <b>Marital status</b> |           |            |
| Bachelor              | 16        | 26.2       |
| Married               | 44        | 72.1       |
| Divorcee              | 1         | 01.6       |

Table 2: The category of illnesses experienced by the respondents

| Illnesses category | Male | Female | Total |
|--------------------|------|--------|-------|
| Upper extremity    | 26   | 22     | 48    |
| Lower extremity    | 05   | 08     | 13    |
| Lower back         | 06   | 05     | 11    |
| Others             | 18   | 14     | 32    |

Table 3: The number of illnesses category experienced by the respondents

| No. of illnesses | Male | Female | Total |
|------------------|------|--------|-------|
| 0                | 6    | 6      | 12    |
| 1                | 5    | 6      | 11    |
| 2                | 14   | 10     | 24    |
| 3                | 6    | 5      | 11    |
| 4                | 1    | 2      | 3     |
| Total            | 32   | 29     | 61    |

Table 4: Mean and standard deviation of the perception towards workplace environment

| Statistical tools | Workstation design |               | Workplace environment |                       |
|-------------------|--------------------|---------------|-----------------------|-----------------------|
|                   | Environment        | Communication | Workstation design    | Workplace environment |
| N                 |                    |               |                       |                       |
| Valid             | 61                 | 61            | 61                    | 61                    |
| Missing           | 0                  | 0             | 0                     | 0                     |
| Mean              | 3.32459            | 3.58105       | 3.73069               | 3.52270               |
| SD                | 4.16195            | 5.22301       | 3.68374               | 9.27070               |

Table 5: The t-test results

| Tests                                   | Methods                            | Work environment        |                             |
|---|------------------------------------|-------------------------|-----------------------------|
|   |                                    | Equal variances assumed | Equal variances not assumed |
| Levene's test for equality of variances | F                                  | 3.61000                 | -                           |
|   | Sig.                               | 0.06200                 | -                           |
| t-test for equality of means            | t                                  | -0.24400                | 0.-24000                    |
|   | df                                 | 59.00000                | 50.15300                    |
|   | Sig. (2-tailed)                    | 0.80800                 | 0.81100                     |
|   | Mean difference                    | -0.58405                | -0.58405                    |
|   | Standard error difference          | 2.39571                 | 2.43503                     |
|   | 95% confidence (lower)             | -5.37786                | -5.47458                    |
|   | Interval of the difference (upper) | 4.20976                 | 4.30647                     |

illnesses at the same time such as upper extremity and lower extremity or lower back and others, etc. (24 cases). Table 4 illustrates the mean and standard deviation of the perception towards the workplace environment factors that consists of environment, workstation design and communication. From these factors, environment has been perceived moderately (mean 3.32459) using 5 Likert scale. Communication or interaction factor has the highest mean (3.73069) compared to the other factors. This finding shows that most of the respondent satisfied with the communication factor in the organization. However, the organizations should think about the environment factor which had been perceived lowest by the respondent. The overall workplace environment has been perceived moderately with mean 3.52270.

Table 5 illustrates the t-test result. Hypotheses 1 has been tested and the result shows that researchers fail to reject the null hypotheses. The significant F-value is 0.062, thus researchers have to assume the equal variance as the significant F-value is bigger  $\alpha$ . The significant t-value is 0.808. From this testing, researcher conclude that there is no significant difference in perception towards the work environment between male and female.

Hypotheses 2 was tested using ANOVA procedure. Table 6 shows the ANOVA output. The F-value is 2.853, while the significant F is 0.032. As the significant F-value is smaller than  $\alpha$ , researchers made a decision that researchers have to reject the null hypotheses. From the analysis, they conclude that the respondent would perceive differently to their work environment based on the number of illnesses they suffer from.

Lastly, researchers run the Chi-square procedure to check whether the DV is dependent of IV or vice versa

Table 6: The ANOVA results

| Work environment | Sum of squares | df | Mean square | F-value | Sig.  |
|------------------|----------------|----|-------------|---------|-------|
| Between groups   | 872.917        | 4  | 218.229     | 2.853   | 0.032 |
| Within groups    | 4283.837       | 56 | 76.497      | -       | -     |
| Total            | 5156.754       | 60 | -           | -       | -     |

Table 7: The Chi-square results

| Statistical tools            | Values             | df | Asymp. Sig. (2-sided) |
|------------------------------|--------------------|----|-----------------------|
| Pearson Chi-square           | 1.037 <sup>a</sup> | 4  | 0.904                 |
| Likelihood ratio             | 1.044              | 4  | 0.903                 |
| Linear-by-linear association | 0.010              | 1  | 0.920                 |
| N of valid cases             | 61.000             | -  | -                     |

<sup>a</sup>2 cells (20.0%) have expected count <5; the minimum expected count is 1.43

(Table 7). From the analysis, researchers found that the  $\chi^2$  value is 1.037 while the significance  $\chi^2$  is 0.904. After comparing the  $\alpha$ , it shows that the significance  $\chi^2$  value is bigger than  $\alpha$ , thus researchers fail to reject the null hypotheses. In a nutshell, researchers can say that the illness experienced is independent of gender.

## DISCUSSION

Appropriate application of ergonomic principles in designing the workplace environment can significantly reduce musculoskeletal injuries. Lack of ergonomics knowledge and awareness of the employers and employees could have been responsible for the poor acceptance of ergonomics in the workplace. Poor ergonomic conditions in industry not only hinder productivity but also affect health and safety of workers and the quality of work and products (Ettner and Grzywacz, 2001; DeRango, 2003). Reality shows that the effects of musculoskeletal disorders include potential permanent disability, difficult to everyday tasks, feelings of depression, anger, anxiety or hopelessness, increased medical costs, decreased productivity, lower employee morale, the cost of replacing an injured employee, overtime pay, frustration and stress. This kind of possessions have been discussed by Cotton and Hart (2003), DeCroon *et al.*(2005), DeLange *et al.* (2002), Sluiter *et al.* (2003), Cooper and Kleiner (2001) and Hitchcock *et al.* (1994).

From the analysis, it shows that the most reported illness is the upper extremity category. This illness category inclusive of headaches, eyes strain, chest pain, shoulder pain, etc. This finding is aligned with Cooper and Kleiner (2001) which stated that eye strain is the most common complaint by the workers. This kind of illnesses has been associated with the advent of computer technology which everyone working almost the whole working day with a computer (Attaran and Wargo, 1999). Bohr (2000) findings also strengthen this opinion that the increased use of computers in now a days working environment has resulted the number of injuries and compensation cost continues to rise.

The most of illnesses category experienced by the respondent shows that majority would suffer from two categories of illnesses at the same time. This combination might be upper and lower extremity or lower back and other, etc. It shows that work-related injuries can easily extend to the different part of human body and causing chronic or permanent damage. This finding is in concurrence with the statements of Beckett (1995) and Martin *et al.* (2003) which stated that musculoskeletal disorders can easily extent to the whole body system and cause in nerve compression or nerve entrapment. Typically, this pain becomes gradually severe and loss of function occurs.

The analysis of mean and standard deviation for each factor in workplace environment shows that the environment factor has been perceived the lowest compared to the other factors whereas communication has the highest perception from the respondent. The workplace environment has been perceived moderately by the respondents. This finding shows that organization should give attention to the workplace environment factors, especially environment and workstation design. The ignorance of these factors leads to workplace hazards, poor worker health, disabilities and will reduce workers' productivity and products' quality (Boles *et al.*, 2004). Employees who report discomfort and dissatisfaction at work will have their productivity affected because the distraction will affect their ability to perform their work properly (Leaman, 1995).

Hypotheses 1 has been tested using t-test. The result shows that there is no significant difference in perception towards the workplace environment between genders. This findings differing from the statements made by Strazdins and Bammer (2004) and Landau *et al.* (1996). They found that the perception towards the workplace environment is different between genders. It is because of now a days, the nature of work itself is changing and these changes are likely affect between genders in different ways. The contradictory findings might be caused by the unawareness of Malaysian towards the importance of workplace environment. This finding in hypotheses 1 might be different if researchers tested with the larger sample size and involved many kind of industries.

ANOVA testing in hypotheses 2 shows that the respondent would perceive differently to their work environment based on the number of illnesses they suffer from. It can be concluded that when workers experienced two or more illnesses in the same time, it leads to different perception towards workplace environment. Workplace environment is perceived badly in lined with the numbers of illnesses. This finding has been supported from

research done by Shikdar and Sawaqed (2003). They found that the illnesses such as back pain, upper-body pain, hand and wrist experienced by the workers, caused the perceived badly of environmental conditions such as noisy environment and lack of resources and facilities.

The Chi-square procedure in hypotheses 3 testing shows that illness experienced is independent of gender. This finding is different from the one reported by Strazdins and Bammer (2004) where they found that gender plays a role in the health status of an individual. In their study, Strazdins and Bammer (2004) concluded that women are more likely to report musculoskeletal problems than men. The contradictory finding also found in Jensen *et al.* (2002), Fahrenberg (1995) and Fillingham *et al.* (1999). They concluded that there is a relationship between genders and illnesses experienced by the workers. Nevertheless, Burke (2002) finding is in coincidence with the results of hypotheses 3 which stated that the male and female reported similar emotional and physical health. Reality shows that now-a-days most women are in paid employment and the nature of work itself is changing. In the office, women spend more time using computers, do more repetitive movements and always report poorer and less comfortable equipment. Furthermore, outside of work, women faced unpaid work involving parenting and cut back on their exercise and relaxation. Moreover, pain sensitivity varies across stages in the menstrual cycle suggesting that sex-linked hormones are involved in pain perception. From this reality, the findings of this research suppose to be different whereas there are gender differences in the perception towards the workplace environment and the gender relationship with the illness experienced by the workers.

This research finding is restricted by the Malaysian workplace environment, where the awareness of workplace ergonomics is still low. The findings might be different if researchers tested the hypotheses in different countries. The results also might be different if we increase the sample size and involve different industries. Authenticity, it is important to create awareness about the important of ergonomics in Malaysian workforce. It will improve health and performance of workers and leads to higher organizational productivity. From the introduction and hypotheses development, it shows that designing workplace environments with a firm understanding of ergonomics can produce huge benefits. The payoffs come in terms of reduced costs for compensation and insurance, greater productivity and enhance employee morale. Even more important it can help employees avoid injuries that cause pain and improve the health outcomes. Companies are realizing that making ergonomic changes

before major work-related injuries occur (Proactive ergonomics) is cost effective when compared with making ergonomic changes after major work-related injuries occur (reactive ergonomics). In short, either we pay now or we pay a lot later in ergonomic changes and possibly sacrifice the quality of life of the workers. An essential component of all solutions is education and training. Ergonomic problems will continue in even the best designed jobs if employees do not know how to use the equipment properly or if they do not have a basic knowledge of ergonomic principles. All of organizations should aware that office is an investment in the company, not just a place for employees to work. It is proven that workplace environment and ergonomics consideration can be beneficial to employee morale, satisfaction and productivity (Dempsey *et al.*, 2004; DeRango, 2003; Fernandez, 1995, Resnick and Zanotti, 1997).

### CONCLUSION

From data analysis, the researchers found that the most frequent illness reported by the sample is the upper extremity category (48 cases, with 26 cases for male and 22 cases for female). This category of illness inclusive of headaches, eye strain, chest pain, shoulder pain, etc. The findings do not support other research that there is significant difference in perception towards the work environment between genders. Nevertheless, the respondent would perceive differently to their work environment based on the number of illnesses they suffer from. The researchers also concluded that the illness experienced by the respondents is independent of gender. The research findings are hoped to improve the workplace design and environment while aiming to minimize problems related to performance and health outcomes.

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