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Perception of Ergonomic Safety Training among School Teachers in Kelantan, Malaysia

(Persepsi Latihan Keselamatan Ergonomik dalam Kalangan Guru Sekolah di Kelantan, Malaysia)

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ABSTRACT

Ergonomic safety is one of the most important issues in many working sectors and this includes educational institutions especially school. It is important to get the information on the teachers' perception of ergonomic safety training. Thus, the researcher manages to identify the suitable methods to prevent more ergonomic problem among teachers in future. Aim of this study was to analyze teachers' perception on ergonomic safety in school and at the same time measured the training requirements on ergonomic safety. Ergonomic safety training in school is important in order to improve good body posture. Survey questionnaires were distributed to 400 teachers. 111 schools randomly selected from the 10 District Education Offices from whole state of Kelantan, Malaysia. Results were then analyzed by using the Statistical Package for the Social Sciences (SPSS) Version 24. Most of the respondents involved in this research are female with the percentage of 68%. Descriptive analysis showed that more than half of respondents understood about ergonomic safety, 78% of them possessed basic safety knowledge and 22% of them lacked on the basic understanding of safety. Interestingly most of the respondents agreed that ergonomic safety should be included in occupational safety and health training in school. It is suggested that all teacher must undergo ergonomic safety training to promote and improve ergonomic safety in school. Higher awareness and more information about ergonomic safety will help teachers teach their students about the importance of ergonomic safety and create a safer environment in their school. As for the conclusion, teachers and students having an important role to ensure ergonomic safety and their commitment will help in reducing the number of ergonomic problems in school.

Keywords: Perception; Ergonomic; Safety; Teachers; School

ABSTRAK

Keselamatan ergonomik menjadi isu paling penting dalam pelbagai sektor pekerjaan termasuk juga institusi pendidikan terutama sekolah. Maklumat berkaitan persepsi guru berkaitan keperluan latihan keselamatan ergonomik kepada guru sekolah sangat penting. Dengan ini, penyelidik dapat mengenal pasti kaedah yang sesuai untuk mencegah masalah ergonomik pada masa akan datang. Kajian ini dijalankan untuk menganalisis persepsi guru terhadap keselamatan ergonomik di sekolah bagi mengetahui keperluan latihan keselamatan ergonomik. Sebanyak 400 soal selidik telah diedarkan kepada guru-guru. 111 sekolah dari 10 Pejabat Pendidikan Daerah di Kelantan, Malaysia telah dipilih secara rawak. Data yang diperolehi dianalisis menggunakan perincian Statistical Package for Science Social (SPSS) Versi 24. Kebanyakkan responden yang terlibat dalam kajian ini adalah perempuan dengan peratusan sebanyak 68%. Analisis deskriptif menunjukkan bahawa lebih separuh dari guru sekolah memahami akan keselamatan ergonomik, 78% mempunyai pengetahuan asas berkaitan keselamatan dan 22% mempunyai kefahaman berkaitan asas keselamatan di tempat kerja. Menariknya hampir semua guru

bersetuju tentang keperluan keselamatan ergonomik untuk disertakan bersama dalam latihan dan kursus keselamatan dan kesihatan pekerjaan di sekolah. Cadangan diutarakan agar semua guru dapat menjalani latihan keselamatan ergonomik bagi meningkatkan keselamatan ergonomik di sekolah. Kesedaran yang lebih tinggi serta maklumat lanjut mengenai keselamatan ergonomik akan membantu guru mendidik pelajar tentang kepentingan keselamatan ergonomik dan mewujudkan persekitaran sekolah yang lebih selamat. Kesimpulan, guru dan pelajar memainkan peranan penting dalam keselamatan ergonomik dan komitmen mereka akan dapat mengurangkan masalah ergonomik di sekolah.

Kata kunci: Persepsi; Ergonomik; Keselamatan; Guru; Sekolah

INTRODUCTION

Currently, in dealing with the rapid changes in nowadays complex modern society, education sector should be improved to in line with the technology-based lifestyle (Wu 2011; De Viliiers 2007 & Heyman 2009). Education as an integrative field contains both practice and theory of health education subjects (Heyman 2009; Siemens et al. 2013 & Nabipour et al. 2015). Therefore, educational organisations should not deal with just physical activities but also with many aspects of life-skills and physical actions. Education needs to provide a solution to the modern technology-based society where kids, teenagers and also adults spend most of their leisure time with gadgets. This unhealthy lifestyle may lead to bad posture, unsuitable movement patterns and loss of basic physical skills which these will leads to an ergonomic problem among us (Heyman et al. 2009).

Ergonomic can be defined as as the science of matching human interaction with the proximate environment (Jayaratne 2012). In the modern working society, ergonomics plays an essential role since it may affect to the peoples' satisfaction, motivation, and creativity (Jayaratne 2012; International Ergonomic Association, 2015 & Nou 2016). In these recent years, there have been some efforts in introducing ergonomic programs for workers in order to improve the workers' movement and at the same time to reduce work-related injuries (Laing et al. 2005; Mayer and Jahnke 2016). The programs seem to face two inherent difficulties according to Heyman (2009). Firstly due to the incorrect movement and habits become strictly altered by short-term programs while the right movement takes a long process. Secondly the postural damage caused by the sedentary lifestyle placed in many daily routines included school.

Moreover, Wiker (2012) highlight an important aspect that affects the effectiveness of these programs is that inefficient mechanical functioning starts at an early age and that back pain and posture problems are already evident in children (Grimmer and Williams 2000). One of the most common health problems faced by working adults is back pain. It can affect workers of all age groups and is most prevalent between the ages of 35 to 55 years. Research by Abdul Hadi (2016) found that about 60%-80% people would experience low back pain at any time in their life.

In order to reduce this health problem, ergonomic principles were applied to workers to ensure their safety in working environment. With the latest scientific evidence, child environments are being focused to apply ergonomic principles (Jayaratne 2012). The school environment has a significant impact on students' health since they spend most of their daytime at school. This was the most critical development stage of their life. Many think that school is a safe place, but it is the opposite. Different behaviour patterns of children expose them to a higher risk of environmental hazards than adults. The school is the working place not just for the teachers, but also for the children. Previous researched by Meyer (2017) also agrees regarding this children behaviour patterns. Behavior and attitudes patterns need to be addressed via proper educative and legislative approaches (Ismail et al. 2015). It is a priceless economic investment in investing children's health (Wamerdan et al. 2017).

Besides, Skilling and Munro (2016) came out with eleven studies on growing back pain, which concluded an average cumulative prevalence of 28.7%. Consistent with this finding, Wiker (2012) stated lower back pain problem highly occured during school years. The statistics were varies due to different country, which are Finland, 20%; England, 26%; Canada, 33%; the United States, 36%; and Switzerland, 51%. Some of the ergonomic programs mentioned the concept of back care for children in a training proper body back-care for young children (Chavez 2005). Apart from that, there was also an increased awareness on the importance of school furniture design suitability for the children's requirements. Studies showed the effect on improving sitting postures among students together with the improvement in certain behavioural factors in the classroom (Milanese and Grimmer 2004).

Moreover, in Malaysia, the history of previous accidents and body mass index indicates that the risk factor of furniture and school bag increased in an odd ratio from 1.67 (leg) to 5.25 (shoulder). From the value, the author suggested that the risk of developing leg for those who carried heavy school bag (>10% body weight) is 1.67 times compared to those who took less. Meanwhile, the result also mentioned the developing risk of shoulder pain was 3 times more than those who carried heavy school bag.

Apart from that, studied by Sambasivam (2017) showed ergonomic hazard as many work activities in the school performed repetitively as the second highest hazard recorded. For example, the repeatedly lifting objects such as reams of papers, books, and massive files from their vehicles to the classrooms by teachers. Other than that, taking these objects at higher location (classes on the more upper floors) could probably cause back problems. Some of the books located at the top of the bookshelves that were too high for the students. This situation could potentially cause neck pain when the students were reaching for the books. The design of the chair or stools also categorised under ergonomic hazard since the

conception of seats in the laboratory did not have backrest to support the lumbar region and upper back of body which can cause potentially the lower back pain (Sambasivam et al. 2017).

However, many of previous the ergonomics improvement research tends to focus on industrial and occupational setting but the less on ergonomics assessment in school environment. Few researches had been done in Malaysia revealed on poor ergonomics environment in Malaysian schools; however no action took by the government and Ministry of Education (MOE) (Tamrin et al. 2005).

Besides that, IHFG (2015), Yuan & Culberson (2011), and Olsen (1992) agree that educational programs related to ergonomic should also considered the adaptation of furniture design. However, this kind of programs did not yet exist. This mainly due to less qualified teachers in this subject and also the costs are too expansive to handle this issue (Olsen, 1992). The management can showed their commitment on school safety by providing training to the teachers so that they'll become an expert and also increased their understanding on safety and health especially in the ergonomic matter. Through this effort, the teachers and students will develop correct posture while sitting or doing activities in classroom or science laboratory; also on the awareness to correct environmental design that will be remain along their entire lifespan (Heyman 2009). So that, it is realy important that teachers need to be trained to educate students regarding ergonomic aspect.

Good communication between students, teachers, and also the management team is the best way to meet the training goals (Park et al. 2015; Freitas & Silva 2017). Training can be defined as the system of knowledge, skills, and attitudes to develop competencies for the effective performance of people in the work environment (Salas and Cannon-Bowers 2001). Salas and Cannon-Bowers (2001) also discussed on the importance of ergonomic safety training that can be incorporated into the learning method and also the course content.

Scientific literatures have stressed on education and awareness strategies in preventing injuries and ergonomic problem among students (Burke et al. 2004). Additionally, safety training programs have been conducted in school environment to evaluate the attitude or behaviour of students that potential to lead to injury in school (Lavack et al. 2008). The program focused on the role of the trainer and knowledge transferred from the trainer to the trainee. Occupational health education, as an essential holistic care component, is a method in promoting health and preventing occupational disease as mentioned by the World Health Organization (WHO). It educate workers with the knowledge on potential hazardous risk factors in working environment and helps to empower self-health management by the awareness on individuals health problems (Kim & Jung 2016).

The increasing level of knowledge showed the improvement of safety knowledge in school education system (NSKC 2004). A well-functioning training can be achieved with a good communication among all people working in school environment (Kopsen 2014). This research will focus in measuring the perception of the teachers towards ergonomic safety training in school organisation especially in Malaysian education sector.

METHODOLOGY

A quantitative method used in this study to measure the perception of ergonomic safety training among teachers in the school of Kelantan, Malaysia. There are 592 schools in Kelantan that located from ten District Education Offices. To identify the sample, this study use cluster and random technique. Thus, 400 teachers from 111 schools randomly selected as the sample to involve in conducting a questionnaire survey. The questionnaire consist of two parts which Section A is about the demographic background of the respondents and Section B is about the perception of ergonomic safety training in school with five questions given. The survey questionnaire was adopted from Mt. Sinai WBV Questionnaire by Eckard (2005). Besides that, the study by Kelly and Phillips (2013) about Ergonomic in the Classroom are one of the references to build the question in this survey. However, the questionnaire was validated by the expert from the background of qualitative and quantitative study to assess the content of this questionnaire regarding the level of understanding of the question, language and validity and also the suitability of each item construct before distribute to sample. After that, pilot study also conducted to ensure this instrument was acceptable to use for this study. The purpose of the questionnaires is to measure the perception of teachers regarding ergonomic safety training in school. After collecting data were completed, data was gone through the screening process before actual analyzed to make sure data were reliable and more precise.

RESULTS AND DISCUSSION

The data were analyzed using the SPSS V24. After the screening process, analyzed was conducted with 394 of the respondent. Figure 1 (a) shows the percentage of gender, which is 32 % are males, and 68% are females.

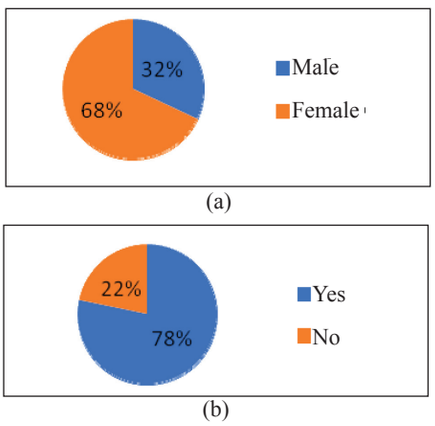

FIGURE 1. (a) Percentage of gender (b) Percentage of primary safety knowledge

Figure 1(b), shows the percentage of primary safety knowledge of the respondent. The result analysed that 78% of respondent have safety knowledge while 22% of them do not have safety and health knowledge. It means that most of the teachers already understand concept safety and health including ergonomic safety in school.

Besides that, Figure 2 shows the percentage of the teacher's working experience. The result shows that 60.3% of teachers are experienced for 15 years and above, 20.8% experienced for 10 to 15 years and 11.8% of teachers experienced around 7 to 9 years. While 5.5% of them have experienced for 4 to 6 years, 0.8% of them for 1 to 3 years and only 1% of them have experienced for less than one year.

The value of Cronbach's Alpha was also taken to measure the reliability and validity of data. It shows the value of 0.947, which is considered reliable (Bahaman 2012).

Table 1 shows the descriptive analysis of the data gathered from the questionnaires survey, which presented the value of percentage, mean and standard deviation. To ensure of suitability to gather detailed measurement that can balance the accuracy of results, the result of mean and standard deviation were also measured (Laila 2015).

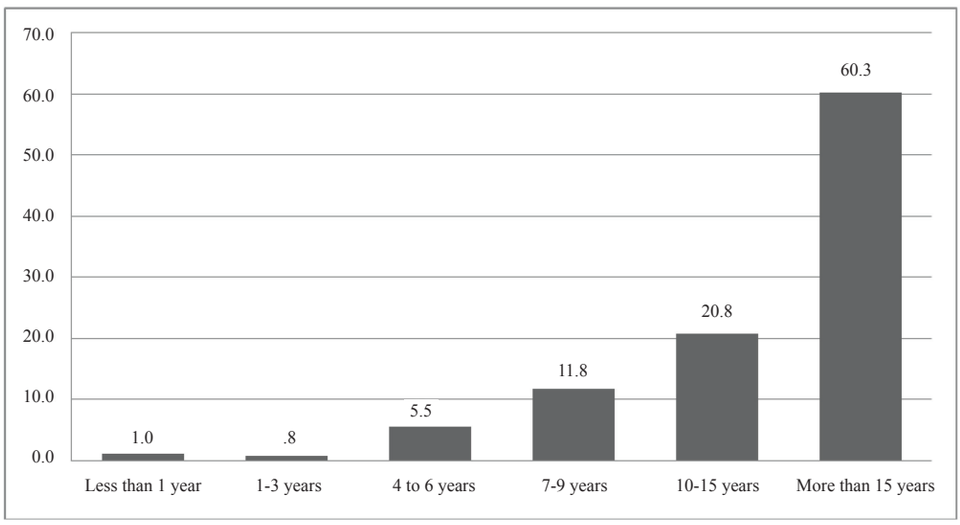

FIGURE 2. Percentage of teacher's working experience

TABLE 1. Descriptive analysis from the survey questionnaires

No	Items	SD %	D %	A %	SA %	Mean	STD
1	Information regarding effects due to incorrect posture should also be emphasized in training	0.0	0.3	50.5	49.3	3.49	0.51
2	Results writing or typing over a long period is also important to emphasize	0.0	2.0	49.5	48.5	3.47	0.54
3	Knowledge of the suitability of chairs and tables among user is important	0.0	1.3	54.0	44.8	3.44	0.52
4	The safety way of using computers in computer labs should be exposed	0.3	1.8	55.3	42.8	3.41	0.54
5	Disclosure of effects resulting from work that requires sitting on a chair within a long time should be emphasized	0.3	4.0	55.3	40.5	3.36	0.57

*SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree, STD: Standard Deviation

CONCLUSION

Based on Table 1, the mean score overall for each question is between 3 and 4, indicating that respondents agree with the statements given in term of ergonomic safety. The matter was sorted based on the highest mean to the lowest mean. The highest perception was regarding the statement of information regarding the effect of the incorrect posture of the body that should be emphasized in training. Most of the teachers agreed with this statement to include in the training provided which is 49.3% strongly agreed and 50.5% agreed. Meanwhile, only 0.3% of teachers disagreed with this statement. It is shown that most of them agree and needs more information and explanation regarding the effect of improper posture on the human body. One of the impacts is a low-back pain. It has been recognized that low-back pain is a common phenomenon that affects public health (Maniakis and Gray 2000). Although a less globally recognized problem, low-back pain has also been described as a public health problem in children (Violante et al. 2015).

Moreover, Vikat et al. (2000) highlight that low back pain occurs due to improper posture while seating. The previous

study, Shireen et al. estimates of lifetime prevalence for low-back pain in children start from 13 to 51% there is point prevalence ranges from 1 to 33% and prevalence of recurrent low-back pain ranges from 7 to 27%. The incidence of pain necessitating medical consultation varies from 8 to 16%, where the pain was affecting by activities in schools and leisure varies between 7 and 27%. This problem will affect the health and motivation of a person (Jones et al. 2004). Thus, the training needs to conduct to teachers to provide more information and increase awareness among teachers.

Besides that, the mean score of the statement regarding training on effects resulting from writing or typing for over a long period is 3.47. From the table, most of the teachers also agreed with this statement with percentage 48.5% strongly agreed, and 49.5% agreed. But, only 2% of teachers not agreed with this statement. It also shows that most of the teachers eager to know and understand more about the effect of writing or typing for a long time. Rempel et al. (2008) identified that long weekly hour of keyboard use might bring to carpal tunnel syndrome. Where, typing action may cause on fluid pressure in the carpal tunnel, a possible mediator of carpal tunnel syndrome, are unknown. Besides that, they also stated that carpal tunnel syndrome risk is low or non-existent when the keyboard used for less than 20 h per week. A population survey of carpal tunnel syndrome was done, with cases confirmed by nerve conduction studies, found an association with computer use (Davis et al. 2004). However, every epidemiological research has limitations, but current evidence suggests that there is an increased risk for the carpal tunnel syndrome for those using the keyboard more than 20 hours per week (Rempel et al. 2008). Thus, this information is very important to include in training to increase awareness of teachers regarding ergonomic safety and provide some idea to overcome the problem from occurring (Chander and Cavatorta 2017).

Apart from that, the result shows that 44.8% of teachers strongly agreed, 54.0% agreed, and only 1.3% do not agree about the training on user comfort of using chair and table in school. It shows that most of the teachers also need training regarding the appropriate design of chair and table that suit with the user. According to Dul and Weerdmeester (2002), designing a workstation is a significant segment of the intangible strategies of motivation since the attitudes towards work and the pleasure of it significantly affect the motivation of work, and also the entire life of the individual. Besides that, research evidence shows widespread mismatches between student body sizes and desks and chair (Jayaratne 2012). Heavy bag pack carriage and unhealthy bag behaviour are significant. The adverse effects range from general tiredness, musculoskeletal pains, spinal deviations, shoulder level shifts, injuries and even psychological disturbances. Thus, proper design should suit with the user to avoid an adverse effect on the body. The training regarding this matter need undergo to increase motivation and awareness among teachers about the ergonomic problem.

On the other hand, the result also shows that 40.5% of teachers strongly agreed, 55.3% of them agreed, 4.0 % disagreed and only 0.3% strongly disagreed regarding disclosure of effects resulting from work that requires sitting on a chair within a long time. This statement had the lowest mean which are 3.36. However, most of the teachers agreed instead of disagreeing. It shows that most of the teachers also need training regarding the effect of sitting on a chair for an extended period. Melanie (2011) have pointed to the health risks of sitting all day, but here has one description of how prolonged sitting affects the bodies and reminders to interrupt resting time whenever possible. The human body just is not built to sit all day at a desk or for an hour's vegging out on the couch. To avoid the health risks, individual advised having 30 minutes exercise of their daily life. Van et al. (2010) also found out that sitting for long periods of time will slow down the circulation of blood and cause fluid to pool into another part of the human. It also had problems range from swollen ankles, and varicose veins to dangerous blood clots called deep vein thrombosis (DVT) (Van et al. 2010). Thus, this issues also important to include in the training to improve ergonomic safety in school.

This study proved that most of the teachers understood and agreed with the importance of ergonomic safety training provision in schools. Knowledge of ergonomic conditions prevents employee discomfort, fatigue, and physical injury. Injury-related to poor ergonomic conditions can be avoided by designing the physical work environment around the physical needs of individual employees.

It is necessary to understand the physiological, psycho-sociological conditions, and anthropometric ergonomic conditions. The teachers should be aware those ergonomic aspects of proper posture, and efficient movement patterns should acquire as part of the education curriculum the school system. The teachers will be able to teach students the needed of ergonomic safety thereby avoiding the effect or ergonomic problem maybe happen in the future. Thus, it is essential to have suitable planning, training, and skill to be ready and able to react effectively.

The training and information received are designed to ensure the teacher's well prepared so that if the ergonomic problem does occur, the response should be immediate, intelligent and most importantly, effective. In addition knowledge regarding ergonomic safety is really significant to prevent and at the same time minimize the effect occurs to the body posture. With a good commitment shown in the school communities, the number of ergonomic problems in schools is expecting to be reduced.

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