
THE ASSOCIATION OF THE LEVEL OF DISCOMFORT AND WORKSTATION DESIGN AMONG DESK JOB WORKERS IN THE TELECOMMUNICATION INDUSTRY

Ilyas Syafiq D.R.^{1*}, Siti Hajar N.Z.², Onery Andy³

Institute of Medical Science Technology¹, Universiti Kuala Lumpur Malaysia², Politeknik Indonusa³

*Correspondence Email : ilyassyafiq@unikl.edu.my

ABSTRACT

Musculoskeletal Disorders (MSDs) are a prevalent condition that affects computer users with poor posture. Office workers are affected because they utilize computers to enter data, write letters, send emails, organize meetings, and communicate with coworkers and clients. Workers in the services sector use computers, phones, work documents, and stationery to communicate with consumers. To assess the level of discomfort for WRMSDs among desk job workers and the association with workstation design. 108 people took the online CMDQ, and 27 were chosen to assess the ROSA based on their scores. Upper back (13.9%), lower back (12.0%), and hip/buttocks (10.2%) reported the most discomfort. 26 (96.3%) participants were high-risk for ROSA and 3.7% were low risk. The result of the association showed that there was no association between the level of discomfort and workstation design. Each body part showed to have a p-value>0.05 associated with workstation design. Those with desk jobs in the telecommunication industry reported feeling the most discomfort in their upper back, lower back, and hip/buttock. The result of grand ROSA showed participants having a high risk of ROSA which required a further assessment. However, there was no significant association between the level of discomfort and workstation design. The finding of ROSA does not relate directly to the bad equipment in the workplace reported by the workers but rather to the improvement of worker's posture, optimizing its use and findings can support the result of this study.

KEYWORDS

Musculoskeletal disorder, level of discomfort, CMDQ, ROSA



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INTRODUCTION

Musculoskeletal Disorders (MSDs) are a common disease, mainly affecting people working a lot with computers and sitting in front of them for hours with improper postures. Because they use computers frequently to enter data, write letters, send emails, schedule meetings, and engage with co-workers and clients, office employees are no exception to being affected by the condition. In the services sector, offices typically include workers who use computers, phones, work documents, and stationery to communicate with customers (Jusoh & Zahid, 2018). According to Sonne et al., (2012), in the last 20 years, the amount of computer work has expanded tremendously. In 2000, 60% of employees were obliged to utilize a computer as part of their work responsibilities, with 80% of those employed admitting to using a computer regularly.

This increase over the previous year's 50% in 1994 and 39% in 1989. Symptoms like exhaustion, discomfort, and pain can emerge in the body and be the first indicators of a musculoskeletal ailment. Increased savings, fewer people feeling hurt, increased productivity, increased morale, and reduced absenteeism benefits ergonomics. Even though WRMSD problems have become more prevalent over time, public knowledge of WRMSD issues in Malaysia remains low. Studies have linked repeated activities, poor posture, and prolonged sitting to WRMSDs. WRMSDs were prevalent in 93.2 percent of computer users over a year (Odebiyi et al., 2016). This disorder can affect the workers by decreasing their quality of life, thus, leading to a decrease in work performance and productivity. In addition, the increase in sick leaves among workers can damage the company's performance and reputation. Therefore, this study was designed to assess the level of discomfort of WRMSDs among desk job workers and the association with workstation design.

RESEARCH METHOD

The study design for this study was cross-sectional study. This study was conducted in telecommunication industry around the Klang Valley. There are 15 telecommunication point around the Selangor. The study was conducted among desk job workers of telecommunication industry in Klang Valley. This study recruited desk jobs workers that fulfilled the following inclusive criteria: Inclusion criteria: (1) Full-time workers (2) Uses computer to do work up to 8 hours a day (3) Working in the same position for the past 12 months (4) Do not have any history related to WMRSDs for the past 12 months before the study. Exclusion criteria: (1) Pregnant (2) Breastfeeding (3) In the menopausal stage (3) Diagnosed with psychological disorders and/or WRMSDs The sample size for this study was 160 participants.

There are three types of questionnaires used during this survey. The first questionnaire aims to assess the general state of the desk job workers' existence problem. It includes several demographic-related questions. Researchers used the Cornell Musculoskeletal Disorder Questionnaire (CMDQ) and the Rapid Office Strain Assessment (ROSA) to reach the study's goal. The explanatory statement, consent form, and questionnaire were included in the CMDQ and ROSA. The CMDQ investigates the frequency and severity of discomfort experienced by participants and the impact this discomfort has on their productivity. It allows participants to use a body diagram as a reference point for defining their pain. Never (0), 1 -2 times weekly (1.5), 3-4 times weekly (3.5), once every day (5), and several times daily were used to code the frequency of discomfort (10). The level of pain, which was coded as slightly uncomfortable (1), moderately uncomfortable (2), and severely uncomfortable (3), was multiplied by this score

(3). Finally, the effect on performance was evaluated as not at all (1), slightly interfered (2), and substantially interfered (3). As a result, a maximum score of 90 might be assigned to each body area. 0 – 3- is mild, 31 – 60 is moderate and 61 – 90 is considered severe and the details of the assessment are needed.

The Rapid Office Strain Assessment (ROSA) was made with the help of postures found in the CSA Z412 standards for office ergonomics (Canadian Standards Association, 2000) and on the website of the Canadian Centre for Occupational Health and Safety (Sonne et al., 2012). There are three parts to the Rapid Office Strain Assessment (ROSA) (A- The chair, B- The telephone and Monitor, and C- Keyboard and Mouse). ROSA's section A, B, C, Peripheral, and Final Score Charts show the increasing values (based on level) found in the head, trunk, and neck. The things related to the different risk factors in the different sub-sections (chair parts, monitor, phone, mouse, and keyboard) are added together to make grand score charts with topics along the axes. The maximum score for each sub-section is based on the presence of all possible risk factors and the length of time it can be used. The highest score that may be achieved within the chair and peripherals scoring charts is a score of 10. The value of 10 was chosen to give participants a simple scale from 1 to 10 that shows how risky the workstation is. According to Jusoh and Zahid (2018), the ROSA standard guideline indicated that a score of 1-2 is considered to have a low risk, scores of 3-4 are considered to have a medium risk, scores of 5-7 are considered to have a high risk, and scores of 8-9 are considered to have a very high risk. Scores higher than five are considered to be "high risk," and it is recommended that the workstation be evaluated even further (Guidelines on Ergonomics Risk Assessment At Workplace, 2017).

The sociodemographic and CMDQ survey was distributed through google forms, while the ROSA was hard copies for the desk job workers between October 2022 and December 2022. The participants were given time to self-answer the survey. A total of 138 participants were completed submitted the online questionnaires.

The data was analysed by using SPSS version 26 software. Descriptive analysis was performed for all variables. To determine the relationship between levels of discomfort between ROSA total scores and the Cornell questionnaire, the Pearson Product Moment Correlation was employed. Using SPSS version 23.0 data were analyzed. A p-value less than (< 0.05) was considered as statistically significant that indicates strong evidence against the null hypothesis.

RESULT AND DISCUSSION

The response rate for this study is 86.25% which involve 138 office workers. Table 1 shows the socio-demographics of urban telecommunication workers (N=138). A total of 108 (67.5%) eligible respondents were included in the data analysis based on their non-history of work-related musculoskeletal disorders. There were 27 males (25.0%) and 81 females (75.0%) with the overall age of respondents' mean (SD) being 2.84 (0.78). In addition, the range was classified into four groups which are 0-25 years old 4 (3.7%), 26-35 years old 31 respondents (28.7%), 36-35 years old 51 respondents with (47.2%) and followed with 46 years old and above is 22 respondents (20.4%). Underweight was 3.7%, normal weight was 50.9%, overweight was 35.2%, and obesity was 10.2%. 87 (80.6) spent at least 7 hours per day, 19 (17.6%) spent 9-10, and 2 (1.9%) spent 11-12.

Approximately 67.5% (N=108) of office workers had at least one of the body areas of pain. This figure is based on the prevalence of Cornell Musculoskeletal Discomfort. According to Table 2, those with desk jobs in the telecommunication industry reported feeling the most discomfort in their upper back (13.9%), followed by their lower back (12.0%), and then their hip/buttocks (10.2%). The most common location for this very

uncomfortable level of discomfort was the lower back. The neck was the body part that participants reported feeling the moderately discomfort in (40.7%), followed by the left and right shoulders (35.2%), upper back (35.2%), and the right wrist (32.4%). Participants also reported experiencing considerable discomfort in their other body parts. The participants reported the least amount of discomfort in the left neck (50.0%), upper back (53.7%), and right shoulder (56.5%).

Based on Rapid Office Strain Assessment (ROSA), approximately 25% (N=27) of office workers had been assessed their workstation design. The chair scored of the rapid office strain among desk job in telecommunication industry is the highest mean (SD) of 4.85 (1.29), followed by mouse and keyboard 4.63 (0.93), and mouse and keyboard 3.59 (0.69).

The figure 1 showed the bar graph of workstation design assessment which indicates low risk and high risk. The result of 26 (96.3%) participants having the high risk of ROSA which required a further assessment and only 3.7% of participants were low risk.

Table 3 showed the association between the level of discomfort and workstation design among desk jobs in telecommunication industry. The result of association showed that there was no association between the level of discomfort and workstation design. Each body part showed to have a p value >0.05 associate with workstation design.

This study was design to assess the level of discomfort for WRMSDs among desk job workers and the association with workstation design.

This study found that 108 (67.5%) of 138 (%) eligible participants were included in the data analysis based on their non-history of work-related musculoskeletal disorders. There were 27 males (25.0%) and 81 females (75.0%) with the overall age of respondents' mean (SD) being 2.84 (0.78). This study reveals that gender affects ergonomic risk factors that can lead to work-related musculoskeletal problems, such as females being more likely to mop, sweep, and clean than males (Messing, 1999). The range was classified into four groups which are 0-25 years old 4 (3.7%), 26-35 years old 31 respondents (28.7%), 36-35 years old 51 respondents with (47.2%) and followed with 46 years old and above is 22 respondents (20.4%). As humans age, they lose strength, flexibility, balance, vision, reaction time and speed, hearing, manual dexterity and feedback, and body fat. According to Shock NW (1984), ageing causes a loss in physical functioning such muscle strength, joint mobility, and reaction time. Underweight was 3.7%, normal weight was 50.9%, overweight was 35.2%, and obesity was 10.2%. 87 (80.6) spent at least 7 hours per day, 19 (17.6%) spent 9-10, and 2 (1.9%) spent 11-12. Working for a prolonged period in an ergonomically deficient workplace can lead to Musculoskeletal Disorders (MSDs). In the previous decade, musculoskeletal diseases have increased 25% globally (Conelly, 2006).

Next those with desk jobs in the telecommunication industry reported feeling the most discomfort in their upper back (13.9%), followed by their lower back (12.0%), and then their hip/buttocks (10.2%). According to the study, a significant prevalence was found, with 67.5% (N=108) of people working desk jobs experiencing discomfort in their body parts. It was discovered that the neck was the site of the most discomfort, followed by the lower back. These conclusions were backed by some studies, including those found in (Cho et al., 2012), the prevalence was high, especially in the shoulder, neck, and upper back areas. In addition, high psychologic distress is significantly associated with shoulder and upper back pain, whereas high workload is associated with lower back pain.

The result of 26 (96.3%) participants having the high risk of ROSA which required a further assessment and only 3.7% of participants were low risk. As finding by (Sonne et al., 2012) in his research on development and evaluation of an office ergonomic risk checklist: ROSA, in other words, a ROSA final score of 5 greater was found to be associated with a significant increase in worker discomfort and may indicate an increased

potential for injury. A well-designed ergonomic workstation will allow any computer user to type in a neutral, comfortable, and optimal position, reducing the chance of injury. In constructing an ergonomic workstation, the necessary components must be accounted for in various ways. Identifying and evaluating these things requires careful preparation to ensure that their use will help the establishment of an ergonomic workstation. The paper discussed six categories of equipment required for this purpose, including a chair, monitor, keyboard, mouse or another stylus, lighting, and a workstation consisting of a desk and document holder.

In this study, it is surprising to find that there was no association between the level of discomfort and workstation design. Each body part showed to have a p value >0.05 associate with workstation design. This finding was supported by Shariat et al., (2018), ROSA scores were significantly but not highly related to those of discomfort and thus exhibits low validity. The findings of ROSA do not relate directly to the bad equipment in the workplace reported by the workers, but rather with the improvement of workers' posture, optimizing its use and findings can support the result of this study (Shariat et al., 2018). The Cornell questionnaire cannot be employed as a tool to estimate the total level of discomfort among office employees due to the fact that the CMDQ examines discomfort levels according to frequency and severity, and the ROSA does not appear to be a reasonable for evaluating the discomfort among office workers as the correlations were low. They are suggesting use of the musculoskeletal discomfort questionnaire (Shariat et al., 2018).

CONCLUSION

It concluded that those with desk jobs in the telecommunication industry reported feeling the most discomfort in their upper back (13.9%), followed by their lower back (12.0%), and then their hip/buttocks (10.2%). The result of grand ROSA showed that 26 (96.3%) participants having the high risk of ROSA which required a further assessment and only 3.7% of participants were low risk. However, there was no significant association between the level of discomfort and workstation design. For further study, the research also can be conducted in many industries and different types of work. Due to the self-administered nature of the data collection and distribution, this study is limited by the possibility of reporting bias. The Cornell questionnaire cannot be used to estimate the total level of discomfort among office employees due to the fact that the CMDQ examines discomfort levels according to frequency and severity, as well as the rate at which individual work performance is negatively impacted, as stated in recent studies (Shariat et al., 2018).

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