

Psychosocial and Ergonomics Risk Factors Related to Neck, Shoulder and Back Complaints among Malaysia Office Workers

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Abstract—Office workers are susceptible to physical health due to the nature of their work. It is therefore, the aim of this study to investigate the association between psychosocial and ergonomics risk factors and neck, shoulder and back complaints among office workers. A total number of 630 office workers participated in this study. The results showed that decision latitude was significantly correlated with shoulder [OR: 1.07 (1.00 – 1.15)] and back [OR: 1.12 (1.04 – 1.20)] complaints. The longer time spent sitting and keying were significantly correlated with neck [OR: 1.21 (1.05 – 1.39)] and back [OR: 1.23 (1.06 – 1.42)] [OR: 0.88 (0.78 – 1.99)] complaints. Working overtime was also related with back complaints [OR: 1.43 (1.01 – 2.03)]. It is suggested that workers should schedule their break and stretching exercise in between tasks to prevent future overuse injury.

Index Terms—Musculoskeletal complaints, office workers, psychosocial factors, office ergonomics.

I. INTRODUCTION

There has been a tremendous increase in the use of computers in the workplace since the last decade. Office workers are among those who use computers to do their job daily. They spend many hours working with computers each day which make them vulnerable to work-related musculoskeletal disorders (MSDs) [1]. This is because they are exposed to office ergonomic risks such as prolong sitting in front of the computer, awkward posture and repetitive movement while typing and using mouse. It was reported in several studies that the intensive use of mouse and keyboard, uncomfortable work posture, remaining seated for prolonged periods, repetitive work and keyboard height were related to the development of MSDs [2]-[8]. Neck and shoulder pain is the most frequent reported MSDs [3], [9]-[11] among computer users in comparison to other disorders such as back, hand, elbow, and wrist [8], [12], [13].

Besides office ergonomic risk, psychosocial factors such as work demands, social support, job stress and work style may also contribute to work-related MSDs such as neck, shoulder, and upper limb [12], [14]-[17]. The combination of positive or negative effect of one or more psychosocial risk such as job demand, job insecurity, job control and support factors may potentially develop negative health related outcomes such as musculoskeletal complaints and psychological health [18].

In addition to the previous study, this study attempt to

investigate the association between i) social support and decision latitude and neck, shoulder and back complaints, and ii) office ergonomic risk factors and neck, shoulder and back complaints among office workers.

II. METHODS

A. Participants

The sample of this study consisted of office workers working in public sector. Questionnaire was distributed to the department/unit that has given their consent to participate in this study. Participation in this study is voluntary and they were given several days to fill in and return to the designated contact person.

B. Measurement Tools

The survey consisted of items covering psychosocial and office ergonomics risk factors and musculoskeletal complaints. Psychological risk factors refer to decision latitude and social support. The questionnaire was adopted from Karasek et al.[19]. Social support consisted of eight questions. While decision latitude consisted of six questions related to skill discretion and three questions related to decision authority. Respondents were to rate using 4 point Likert scales, ranging from strongly agree to strongly disagree. The office ergonomics risks factors were measured according to the number of years working using computer, number of hours keying and sitting in front of computer, number of times taking break, stretching exercise (Y/N), ability to alternate computer work and non-computer work (Y/N), regulate work pace (Y/N), experience time pressure to complete task (Y/N) and work overtime (Y/N).

Musculoskeletal complaints refer to any aches, pain, disorders or numbness in a body region as a result of computer work. Body regions of interest included the neck, shoulder and back (upper and lower). The right and left body regions were combined as one entity, for example left and right shoulder, as shoulder for analysis. The 12 month prevalence rate of MSDs was measured with the adapted Nordic Musculoskeletal Questionnaires (NMQ) [20]. The NMQ has been used extensively in different occupational settings to measure musculoskeletal disorders [21]-[24].

C. Data Analysis

The prevalence rates of musculoskeletal complaints were analyzed using frequencies and percentages with 95% confidence intervals. Logistic regression analysis was used to assess the relationship between risk factors and musculoskeletal complaints among computer users. Gender,

age and exercise were adjusted as confounder variables in the analysis.

III. RESULTS

The response rate was 63% (630 respondents). The majority of respondents were female (72.1%). The average age of the respondents is 33.9 ± 8.9. The average years of working experience using computers is 10.6 ± 6.8.

A. 12 Month Prevalence Rates of Musculoskeletal Complaints

The findings of the study showed that the highest prevalence rates of musculoskeletal complaints among office workers is shoulder complaint (51.4%), followed by neck (49.4%) and back (38.9%) (Table I).

TABLE I: PREVALENCE RATES OF NECK, SHOULDER AND BACK COMPLAINTS

Body region	Percentage (%)	95% CI
Neck	49.4	45.5 – 53.3
Shoulder	51.4	47.5 – 55.3
Back (Upper and lower)	38.9	35.1 – 42.7

TABLE II: ASSOCIATION BETWEEN PSYCHOSOCIAL AND OFFICE ERGONOMICS RISK FACTORS AND NECK COMPLAINT ADJUSTED FOR GENDER, AGE AND EXERCISE

	Neck	
	OR	(95% CI)
Years working with computer	1.00	(0.97 – 1.04)
Hours Sitting	1.21*	(1.05 – 1.39)
Hours Keying	0.91	(0.81 – 1.02)
Break	0.99	(0.91 – 1.06)
Stretching	1.08	(0.67 – 1.76)
Alternate Tasks	1.14	(0.65 – 2.01)
Work Pace	1.06	(0.66 – 1.69)
Time Pressure	0.89	(0.58 – 1.39)
Overtime	1.11	(0.79 – 1.56)
Decision latitude	1.07	(1.00 – 1.14)
Social Support	0.96	(0.92 – 1.01)

*Significant $p < 0.05$

B. Association between Risk Factors and Musculoskeletal Complaints

TABLE III: ASSOCIATION BETWEEN PSYCHOSOCIAL AND OFFICE ERGONOMICS RISK FACTORS AND SHOULDER COMPLAINT ADJUSTED FOR GENDER, AGE AND EXERCISE

Risk factors	Shoulder	
	OR	(95% CI)
Years working with computer	1.03	(1.00 – 1.07)
Hours Sitting	1.14	(0.99 – 1.32)
Hours Keying	0.93	(0.83 – 1.05)
Break	0.96	(0.89 – 1.04)
Stretching	1.15	(0.70 – 1.88)
Alternate Tasks	1.42	(0.80 – 2.50)
Work Pace	0.84	(0.52 – 1.35)
Time Pressure	1.17	(0.75 – 1.82)
Overtime	1.24	(0.88 – 1.75)
Decision latitude	1.07*	(1.00 – 1.15)
Social Support	0.96	(0.91 – 1.01)

*Significant $p < 0.05$

TABLE IV: ASSOCIATION BETWEEN PSYCHOSOCIAL AND OFFICE ERGONOMICS RISK FACTORS AND BACK COMPLAINT ADJUSTED FOR GENDER, AGE AND EXERCISE

	Back	
	OR	(95% CI)
Years working with computer	1.00	(0.95 – 1.03)
Hours Siting	1.23*	(1.06 – 1.42)
Hours Keying	0.88*	(0.78 – 0.99)
Break	1.00	(0.92 – 1.07)
Stretching	1.17	(0.71 – 1.91)
Alternate Tasks	1.20	(0.67 – 2.14)
Work Pace	1.32	(0.82 – 2.15)
Time Pressure	1.36	(0.87 – 2.10)
Overtime	1.43*	(1.01 – 2.03)
Decision latitude	1.12*	(1.04 – 1.20)
Social Support	0.96	(0.91 – 1.01)

*Significant $p < 0.05$

The results of the analysis indicated that only number of hours sitting is significantly associated with neck complaint ($p = 0.01$) (Table II). As for the shoulder complaint, decision latitude was significantly correlated with the complaint ($p = 0.04$) (Table III). The findings showed that the number of hours sitting ($p = 0.006$), number of hours keying ($p = 0.031$), working overtime ($p = 0.043$) and decision latitude ($p = 0.002$) were correlated with back complaints among computer users (Table IV).

IV. DISCUSSION

The findings of this study reported high prevalence rates of neck, shoulder and back complaints among office workers. These findings are consistent with other studies conducted among computer users in Malaysia. One study reported 33% (95% CI 28.8 to 37.3) prevalence of work-related upper limb disorder (WRULS) and those who used computers more than 5 hours per day are 7.5 times (95% CI 2.3 to 24.2) more likely of developing WRULS [25]. Another study conducted by Sen et al. [26] related to the symptoms of Occupational Overuse Syndrome (OOS) among 136 secretarial staff and undergraduate students who used computer. The study reported that non proper workstation ergonomics increased the risk of developing neck, back and wrist disorders. In addition, the findings from the western counterparts also reported high prevalence rates of musculoskeletal complaints among computer users; from example in the Netherlands [3], Sweden [9], [27], Brazil [28], Germany [4], Finland [11], Australia [29] and US [30].

Time spent sitting in front of the computer was the significant risk factor for neck and back complaints. While longer hours spent typing was found to be a risk factor for back complaints. These findings are supported by several other studies on the effect of ergonomic factors such as longer hours of mouse and keyboard use, prolonged sitting and uncomfortable postures in workers on MSDs [8], [11], [28], [31].

Working overtime is also significantly correlated with back complaints. Working overtime means workers have to work beyond one's scheduled working hours. Workers might need to finish their work deadline and facing with heavy job demands. Our finding is in consistent with study conducted

by de Castro [32], reported that frequency of working mandatory overtime was associated with work-related injury. Further, it was reported in another study that working in jobs with overtime schedules put workers at higher injury hazard rate compare to jobs without overtime [33]. Our study also found that decision latitude was the risk factor for shoulder and back complaints among computer users. The result is in accordance with the findings of a systematic review suggested that there is association between psychosocial risk factors such as job demands, social support, decision latitude and upper extremity disorders [34].

It can be concur from our findings and other previous studies that office workers are susceptible to musculoskeletal complaints and can be incremental if they were not prevented at the early stage. This can be supported by the findings from the prospective longitudinal studies ranging from three months to 5.4 years, the risk of disorders increases among those who have high work strain, intensive mouse and keyboard use, perceived high muscle tension and previous neck and shoulder symptoms [5], [7], [15], [29], [35]-[37] in a long run.

V. CONCLUSION

There was as high prevalence rates of musculoskeletal complaints in the neck, shoulder and back. Number of hours spent sitting and typing, working overtime and decision latitude were related to neck, shoulder and back complaints among office workers. It was suggested that workers should schedule their break and stretching exercise in between task to avoid overuse injury. Employers should provide employees with flexible work station and training on office ergonomics to provide them with appropriate knowledge.

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