UNIVERSITI PUTRA MALAYSIA

PREVALENCE OF MUSCULOSKELETAL SYMPTOMS AND ASSOCIATED RISK FACTORS AMONG WORKERS IN THE PRINTING INDUSTRY

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By

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PREVALENCE OF MUSCULOSKELETAL SYMPTOMS AND ASSOCIATED RISK FACTORS AMONG WORKERS IN THE PRINTING INDUSTRY

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Introduction: Musculoskeletal disorders (MSD) continue to be a major occupational safety and health issue in most industrialized countries and are a main cause of work-related disability and lost-time illnesses. Multiple risk factors could cause MSD. The relationship between occupational factors and MSD has been widely reported in different studies. The activities in the workplace such as repetitive movements, forceful exertion and prolonged standing or sitting posture known to be important MSD risk factors. In printing manufacturing, workers are directly exposed to the production process with job tasks requires heavy load lifting, carrying, pushing and the maintenance of awkward postures. For these reason, workers has a high probability associated with musculoskeletal symptom (MSS). In Malaysia, the printing industry is among the oldest and the top five largest industries in the manufacturing sectors. However, there is little information about the magnitude of the musculoskeletal problems and lack of assessment of working posture among the study population. **Objective:** This study aimed to identify the

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prevalence of musculoskeletal symptom (MSS) by body parts and to determine the relationship between socio-demographic, individual and occupational factors with MSS among printing production line workers. **Method:** A cross-sectional study was carried out at printing manufacturing company in Klang Valley, Malaysia. Respondents were randomly selected and a total of 250 workers who met the inclusion criteria participated in this study. The socio-demographic information and MSS were obtained through Standardized Nordic Questionnaire (SNQ). The posture analysis was performed using Rapid Upper Limb Assessment (RULA) method. The data was analyzed by using Statistical Package of Social Science (SPSS) version 19.0. **Result:** The overall prevalence of MSS was 79.6% and the highest prevalence by body parts were the lower back (48.0%). 70.0% of workers recorded RULA score above 5. There were significant association between MSS with age ($p=0.017$), gender ($p=0.030$), job duration ($p=0.020$) and RULA scores ($p<0.05$). Multiple logistic regression analysis showed that the significant risk factors for MSS were gender (2.88, 95% CI 1.66-8.16), job duration (1.06, 95% CI 1.01-1.12), RULA score 3 (6.00, 95% CI 1.37-27.09), RULA score 4 (8.20, 95% CI 1.55-43.43), RULA score 5 (9.10, 95% CI 1.97-42.07), RULA score 6 (14.38, 95% CI 3.09-66.99) and RULA score 7 (25.85, 95% CI 5.07-131.91). **Conclusion:** The overall prevalence of MSS was relatively high in the printing industry population. Age, gender, job duration and RULA scores were associated with MSS. Effective prevention strategies are required to address MSD in this population in order to minimize the risk for MSD.

Keywords: Musculoskeletal symptom (MSS), printing workers, Rapid Upper-Limb Assessment (RULA), Standardized Nordic Questionnaire (SNQ)

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai keperluan untuk memenuhi ijazah Sarjana Sains

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PREVALENS GEJALA MASALAH GANGGUAN OTOT RANGKA DAN PERHUBUNGAN ANTARA FAKTOR RISIKO DI KALANGAN PEKERJA-PEKERJA INDUSTRI PENCETAKAN

Oleh

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Pengenalan: Masalah gangguan otot rangka terus menjadi penyebab utama dalam kecederaan pekerjaan di negara-negara perindustrian maju dan yang sedang membangun. Ia merupakan punca utama yang berkait dengan kerja hilang upaya di kalangan pekerja. Terdapat banyak faktor yang menyumbang kepada masalah gangguan otot rangka pada asalnya. Perhubungan antara faktor-faktor pekerjaan dan masalah gangguan otot rangka banyak dilaporkan dalam kajian sebelum ini. Aktiviti-aktiviti di tempat kerja seperti pergerakan berulang-ulang, melakukan kerja secara paksa, dan berkepanjangan berdiri atau duduk diketahui sebagai faktor risiko yang penting. Dalam industri percetakan, pekerja-pekerja terdedah secara langsung kepada proses pengeluaran yang melibatkan kerja mengangkat, membawa atau menolak beban berat dan mengekalkan postur canggung untuk tempoh masa yang lama. Oleh itu, pekerja mempunyai kebarangkalian yang tinggi untuk melaporkan aduan masalah gangguan pada otot rangka. Di Malaysia, industri percetakan merupakan industri yang ke-lima terbesar dalam sektor pembuatan. Walau bagaimanapun, maklumat tentang masalah gangguan otot rangka adalah terhad dan kurangnya penilaian postur kerja di kalangan populasi kajian. **Objektif:** Tujuan kajian adalah

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untuk mengenalpasti prevalen gejala masalah gangguan otot rangka serta untuk menentukan hubungan antara masalah gangguan otot rangka dengan faktor-faktor socio-demografi, individu dan pekerjaan di kalangan pekerja pencetakan. **Kaedah:** Satu kajian keratan rentas telah dijalankan di beberapa kilang percetakan komersil di Lembah Klang, Malaysia. Pekerja dipilih secara rawak berdasarkan kriteria inklusi dan sebanyak 250 pekerja terlibat dalam kajian. Sesi temuramah dengan setiap pekerja dilakukan untuk mendapatkan maklumat gejala masalah gangguan otot rangka dengan menggunakan borang soal selidik *Standardized Nordic Questionnaire (SNQ)* dan taksiran postur kerja melalui *Rapid-Upper Limb Assessment (RULA)*. **Hasil kajian:** Prevalens gejala masalah otot rangka di kalangan pekerja percetakan adalah 79.6%. Gejala masalah otot rangka yang paling umum pada anggota badan adalah bahagian belakang bawah (48.0%). 70.0% pekerja mencatat skor RULA 5 dan ke atas. Terdapat hubungan yang signifikan antara masalah gangguan otot rangka dengan umur (p=0.017), jantina (p=0.030), tempoh pekerjaan (p=0.020) dan skor RULA (p<0.05). Analisis regresi logistic ganda menunjukkan bahawa faktor risiko yang signifikan dengan masalah gangguan otot rangka adalah jantina (2.88, 95% CI 1.66-8.16), tempoh pekerjaan (1.06, 95% CI 1.01-1.12), skor RULA 3 (6.00, 95% CI 1.37-27.09), skor RULA 4 (8.20, 95% CI 1.55-43.43), skor RULA 5 (9.10, 95% CI 1.97-42.07), skor RULA 6 (14.38, 95% CI 3.09-66.99) dan skor RULA 7 (25.85, 95% CI 5.07-131.91). **Kesimpulan:** Prevalens gejala masalah gangguan otot rangka di kalangan pekerja industri percetakan adalah tinggi. Usia, jantina, tempoh pekerjaan dan skor RULA dikaitkan dengan gejala masalah gangguan otot rangka. Strategi pencegahan yang efektif diperlukan untuk mengatasi dan mengurangkan masalah gangguan otot rangka pada populasi ini.

Kata kunci: Masalah gangguan otot rangka, pekerja pencetakan, Rapid Upper-Limb Assessment (RULA), Standardized Nordic Questionnaire (SNQ)

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I certify that an Examination Committee has met on date of viva voce to conduct the final examination of Foong May Chi on her Master of Science thesis entitled “prevalence of musculoskeletal symptom and its associated risk factors among workers in printing industry” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The committee recommends that the

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DECLARATION

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I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

_____

FOONG MAY CHI

Date: 14 May 2012

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