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ORIGINAL ARTICLE

Preliminary study of the patterns and physical risk factors of work-related musculoskeletal disorders among academicians in a higher learning institute

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Abstract
Background Research has been conducted on the prevalence and physical risk factors of work-related musculoskeletal disorders (WMSDs) among occupations such as agriculture workers, office workers, school teachers, and health care professionals. However, a paucity of research exists on the patterns and physical risk factors of WMSDs among the academicians in a higher learning institution. This study was conducted to determine the patterns and physical risk factors of WMSDs among the academicians.
Methods A cross-sectional study was conducted among 228 subjects with a mean age of participants of 32.3 ± 7.8 for a period of 1 year from December 2011 until December 2012. An extended neordic musculoskeletal questionnaire (NMQ-E) was used to assess the patterns of work-related musculoskeletal disorders. The short version of the Dutch musculoskeletal questionnaire (DMQ) was used to determine the physical risk factors of WMSDs among the academicians. Descriptive statistics and Pearson Chi square test were used for data analysis.
Results The 1-year pattern of WMSDs among the academicians were neck pain (44.7 %), followed by shoulder pain (40.4 %), upper and lower back pain (33.3 %), and the least common region was elbow pain (3.5 %). Among 20 common physical activities in DMQ, 15 physical activities performed by the academicians in their workplace were considered as a physical risk factors for neck, shoulder, and back pain at $p < 0.05$.
Conclusion The preliminary study demonstrated that neck pain, shoulder pain, and back pain were the most common WMSDs among the academicians in a higher learning institution.

Introduction

Work-related musculoskeletal disorders (WMSDs) is defined as injuries or disorders of the musculoskeletal system, which includes muscles, nerves, tendons, joints, cartilages, and spinal discs that may be associated with exposure to risk factors in the workplace [1]. The World Health Organization (WHO) has described that multifactorial risk factors were responsible for WMSDs among workers all over the world [2]. Physical demands that are imposed on the body at the work place such as awkward or fixed posture for a long time, heavy lifting, and repetitive tasks are reported to be the causes or aggravating factors for WMSDs [2]. These factors may lead to disability, which are responsible for poor quality of life, and may predispose workers to a substantial amount of health care costs, and it has been projected that these disabilities by 2020 will predispose workers to serious societal and public health issues [3, 4].

WMSDs are common among agricultural workers, office workers, health care professionals, and school teachers [5–12]. Past studies have revealed the prevalence range for neck pain (69.3 %), neck shoulder pain (48.7 %), low back

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pain (45.6 %), and upper limb pain (35.8 %) among school teachers in Asian countries [9, 10]. Further, a population-based study conducted by Chaiklieng et al. [11] found that a six-month prevalence of musculoskeletal disorders (MSDs) was 73.7 % among Thailand school teachers with a high prevalence of lower back pain, shoulder, upper back pain, neck pain, and arm pain, which ranged between 24 % and 54 %. In Malaysia, the prevalence of lower back pain was at 40.4 % among school teachers in Klang Valley, Selangor [12]. Various researches suggested that repeated activities performed by school teachers in a prolonged sitting posture such as reading, marking of assignments, computer usage, prolonged standing posture such as teaching in class, and repetitive overhead writing on board were the causes of WMSDs [10–13].

In our opinion, the working environment of academicians who are working in higher learning institutions like universities is quite similar to the school teachers and office workers. Data on academic staff throughout Malaysia showed that 64,882 are involved in teaching professions in the higher learning institutions [14]. In addition, the academician populations are on a steady rise due to the commencement of various new universities, university colleges, and colleges to produce highly qualified graduates in line with the vision and mission of the Ministry of Higher Education, Malaysia. Moreover, our patient database showed that academic staff visiting the physiotherapy clinic at Universiti Teknologi Mara (UiTM) for musculoskeletal illnesses has steadily increased in the last few years. Hence, it was hypothesized that academic staff involved in higher learning institutes may be at risk of WMSDs as with other teaching professionals. However, there exists a paucity of research conducted on the patterns of WMSDs and their physical risk factors among the academicians in higher learning institutions as compared to school teachers. Therefore, a study was conducted to determine the patterns of WMSDs and physical risk factors among the academicians.

Methods

This was a cross-sectional study conducted among academicians from December 2011 to December 2012. All the study subjects were recruited across 5 faculties such as Health Sciences, Information Technology, Hotel Management, Business Management, Pharmacy, and the Centre for Foundation Studies from a public university in Malaysia. Among 24 faculties, five faculties were selected as a pilot sample zone and were located in the same campus. Hence, we adapted universal sampling with convenient samples for the pilot study to recruit the samples. The inclusion criteria were the following: all staff who worked as a full-time academician with at least 1 year of teaching experience and those aged between 23 and 60-years-old. Subjects who reported any systematic disorder or any other musculoskeletal injuries such as fracture and soft tissue injuries in any of the regions of the body prior to entering academia were excluded. The researcher visited the subjects' work place to brief them about the whole study process, including objectives of the study, and obtained informed consent from all subjects prior to the collection of data. This study was approved by the Research and Ethics Committee of Universiti Teknologi MARA (UiTM).

Measurement tools

The researcher distributed the Extended Nordic Musculoskeletal Questionnaire and the short version of the Dutch musculoskeletal questionnaires to all subjects of 5 faculties. The data were collected in a subject's respective workplace. It took about 15 min to complete both questionnaires. Prior to the collection of data, a pilot testing of both questionnaires was carried out among 15 subjects from 3 of each of all the five faculties who responded well to the questions, thus, indicating the clarity of the questions.

Extended Nordic Musculoskeletal Questionnaire

The patterns of musculoskeletal symptoms among the subjects were measured using the Extended Nordic Musculoskeletal Questionnaire (NMQ-E). The NMQ-E consists of general questions on the history of having trouble in any of the 9 body regions: neck, upper back, lower back, shoulder, elbow, hand/wrist, hip, knee, and ankle/foot in a 1-year duration. This questionnaire is accompanied by a body map diagram, which facilitated the subjects locating their pain or discomfort sites in their bodies. In addition, questions were also asked regarding the subject's lifetime ("ever"), followed by the prevalence questions, and, lastly, on the items related to consequences of pain in the whole year. The response categories were restricted to "yes" and "no." The NMQ-E has been shown to be reliable for collecting information about the onset, prevalence, and consequences of musculoskeletal pain in the 9 body regions among students [15].

Dutch Musculoskeletal Questionnaire

The physical risk factors associated with the working conditions in the current job were measured by using the shortened version of the Dutch Musculoskeletal Questionnaire (DMQ). The short version of the DMQ consists of the areas of general, health 2, work 1, and work 2 from the standard version of the DMQ. We identified 20 questions according to the job nature of the academicians from the standard version of DMQ and listed the same in work 1 of the shortened