



Prevalence and predictors for musculoskeletal discomfort in Malaysian office workers: Investigating explanatory factors for a developing country



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ARTICLE INFO

Article history:

Received 15 October 2014

Received in revised form

8 October 2015

Accepted 9 October 2015

Available online 20 October 2015

Keywords:

Musculoskeletal disorders

Risk

Discomfort

Office workers

Prevalence rate

ABSTRACT

Musculoskeletal disorders (MSDs) are a major occupational health issue for workers in developed and developing countries, including Malaysia. Most research related to MSDs has been undertaken in developed countries; given the different regulatory and cultural practices it is plausible that contributions of hazard and risk factors may be different. A population of Malaysian public service office workers were surveyed ($N = 417$, 65.5% response rate) to determine prevalence and associated predictors of MSD discomfort. The 6-month period prevalence of MSD discomfort was 92.8% (95%CI = 90.2–95.2%). Akaike's Information Criterion (AIC) analyses was used to compare a range of models and determine a model of best fit. Contributions associated with MSD discomfort in the final model consisted of physical demands (61%), workload (14%), gender (13%), work-home balance (9%) and psychosocial factors (3%). Factors associated with MSD discomfort were similar in developed and developing countries but the relative contribution of factors was different, providing insight into future development of risk management strategies.

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1. Introduction

Musculoskeletal disorders (MSDs) are a major work-related problem, comprising a third of all compensable diseases in North America, the Nordic countries and Japan (Punnett et al., 2005), similar figures are reported in other countries (Australian Safe and Compensation Council (ASCC), 2006; Linaker et al., 2011). High financial and social costs have been reported despite a significant focus on reducing the incidence of MSDs (Linaker et al., 2011). Occupational influences on MSD development are significant, up to 37% of all back pain has been linked to workplace exposures; however, large variations between countries have been identified (Punnett et al., 2005). Analysis undertaken as part of the global burden of disease study (Driscoll et al., 2014), estimated that disability adjusted life years (DALYs) for low back pain were 331 in

Australia compared to 482 in South East Asia, where a large reliance on highly intensive agricultural practices contributes significantly to these differences; further insights are required to understand why these differences occur and the role of work organisation in the development of MSDs. These figures also do not include informal workers nor cumulative exposures and so are considered indicative of risk rather than absolute figures. This study aims to address the knowledge gap regarding MSD discomfort in the context of a developing country.

A number of frameworks describe the multifactorial nature of MSD development with contributions from physical and psychosocial workplace factors (e.g. National Research Council, 2001; Bongers et al., 2006; Karsh, 2006). However, most of these frameworks have been constructed in developed countries where formalised compensation and insurance schemes operate and significant attempts have been made to reduce the large numbers of MSDs over the past two decades. Developing countries typically have less formal systems and risk management aimed at reducing MSD hazard and risk factors is relatively recent and in its early stage of development.

The contribution of physical and psychosocial factors to the

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development of MSDs is well accepted with a strong evidence base to support contributions from a range of workplace hazards (NRC, 2001; Oakman and Chan, 2015; Widanarko et al., 2015). In particular, interactions between physical and psychosocial factors have been linked with increased development of musculoskeletal symptoms (Widanarko et al., 2012, 2015). Although the relative contribution of factors may vary between workplaces, evidence suggests that even in physically demanding work, psychosocial factors are an important predictor of MSD development (Gerr et al., 2014).

Office work has been linked with high rates of MSD prevalence (van den Heuvel et al., 2006; Janwantanakul et al., 2008), through exposure to physical and psychosocial stressors in the workplace. Prevalence rates of MSD in office workers have been reported from 19% to 84% (Blatter and Bongers, 2002; Harcombe et al., 2009), this large variation is expected given the vastly different working environments and measures used across the different studies (Marras et al., 2009). In Malaysia, three studies were identified which had investigated MSDs in office workers (Premalatha and Noor Hassim, 1999; Abdul Rahman and Atiya, 2009; Mahmud et al., 2014). Work-related upper limb disorder (WRULDs) prevalence rates for office workers were reported as 33% in public (Abdul Rahman and Atiya, 2009) and 31% in private sector employees (Premalatha and Noor Hassim, 1999). Another study by Mahmud et al. (2014) analysed MSD complaints and whether a training program had reduced the number of complaints by body area but did not report an overall prevalence rate.

The importance of work organisation and culture on MSD development (Carayon et al., 1999; Janwantanakul et al., 2009) suggests a need for studies to be culturally specific, particularly in cases where different organisational or religious practices operate. An important factor in developing effective risk management strategies is the identification of relevant hazard and risk factors. We argue that as Malaysia is a developing country, identifying relevant predictor models are needed to explore the most relevant factors in predicting MSD discomfort. To date little exploration of MSDs in office workers based in developing countries has been undertaken. The aim of the current study is to estimate the prevalence of MSD discomfort in Malaysian public service office workers. Secondly, a model describing relevant predictors—psychosocial and physical—of MSD discomfort will be developed. These findings will contribute towards a body of knowledge needed to inform development of intervention strategies to reduce MSD discomfort in developing countries such as Malaysia.

2. Methods

2.1. Study population and design

This cross-sectional study was conducted with public sector employees based in the city of Putrajaya, Malaysia. Twenty-two public sector organisations were contacted and invited to participate, with four organisations agreeing to participate on the condition of anonymity for organisations and individuals that participated. Eligible employees were over 18 years of age and currently employed by the organisation, 636 potential office based workers were identified as potential participants in the study. Participation in the study was voluntary. The first author (IM) administered the questionnaire which took 20–30 min to complete. Respondents were provided with time and a separate room to complete the questionnaire during normal working hours.

The questionnaire was modified from one previously administered in a number of Australian workplaces (Oakman et al., 2014). The tool was translated into Malay using a back translation procedure to ensure consistency across different languages and

maximum accuracy in the translated version (Brislin, 1970). Pilot testing was undertaken on 12 participants before distribution to all respondents. Participants commented on various aspects of the questionnaire, such as the use of appropriate terminologies for the type of office work undertaken in each organisation, and on the distribution procedure for participants. Comments were assessed and used to make minor adjustments to improve clarity of the questionnaire distributed to the organisations. Each participating organisation approved the conduct of the survey. Ethics approval was obtained through the La Trobe University Human Ethics Committee (No. FHEC12/092).

2.2. Questionnaire

The questionnaire included questions relating to demographics, job satisfaction, work-home balance, physical and psychosocial hazards, and MSD discomfort, full details are reported elsewhere (Oakman et al., 2014).

Demographic information was collected on: age, gender, length of service, and work location.

A single item on both job satisfaction and work-home balance was measured on a 5-point scale (1 = very dissatisfied, 2 = dissatisfied, 3 = neutral, 4 = satisfied, and 5 = highly satisfied) (Oakman et al., 2014).

2.2.1. Physical, workload and psychosocial workplace hazards

A 12-item measure of physical hazards and 4-items on workload were used with a 5-point response scale (1 = never or hardly ever, 2 = seldom, 3 = sometimes, 4 = often, 5 = almost all the time) (Oakman et al., 2014). Reliability of the physical hazards and workload scale was 0.80 and 0.89, respectively.

Twenty-six items from the Work Organisation Assessment Questionnaire (WOAQ) (Griffiths et al., 2006) were used to assess workplace psychosocial hazards using a 5-point scale (1 = major problem, 5 = very good). Cronbach's alpha for WOAQ was 0.93.

2.2.2. Outcome measures

Participants were asked to indicate if they had experienced discomfort toward the end of the work day in the past six months (yes/no). Those who responded yes were asked to record frequency and severity of their symptoms across five body regions: 1) neck & shoulder, 2) hands & fingers, 3) arms, 4) middle to lower back, and 5) hips, bottom, legs and feet (Macdonald et al., 2007). Frequency was recorded on a scale of 0–4 (no discomfort to almost always), and severity from 1 to 3 (mild, moderate to severe discomfort). Scores were calculated for each region by multiplying frequency and severity. These scores were then added together to form an overall score out of a possible 60. Cronbach's alpha for this scale was 0.92. This question formed the outcome measure of self-reported MSD discomfort.

2.3. Data analysis

Descriptive statistics were used to describe the study population (see Table 1) and bivariate correlations used to examine the relationship between dependent and independent variables.

Data cleaning was conducted to identify missing data, two variables – physical demands and psychosocial factors (WOAQ) were found to have 8% of cases missing. Mean replacement method (Tabachnick and Fidell, 2005) was used to replace missing values and analyses were conducted with and without missing variables. No significant differences were found in the results of the respective analyses. Final model analysis was undertaken using data with mean replacement values.

The study utilised Akaike's Information Criterion (AIC), based on

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