



Risk management: Where should we target strategies to reduce work-related musculoskeletal disorders?



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ABSTRACT

Work-related musculoskeletal injuries and disorders (WMSDs) present a major problem throughout the world. Strategies to control risks associated with WMSDs typically focus on strategies to reduce the bio-mechanical loads that people experience during work. It is now evident that to focus workplace risk management strategies only on physical actions during task performance is not the optimal way to reduce WMSD risk. Evidence suggests that risk controls need to be developed in a participative way and controls need to incorporate all hazards and risk including physical and psychosocial. 1381 Responses from 8 jobs in 6 organisations in 3 different industry sectors, in Melbourne, Australia, were analysed for differences in predictors of WMSD risk using ANOVA and multi-modelling. Analysis of results across sector, organisation and job levels found that WMSD risk levels were different across all 8 jobs. Despite differences in levels or risk physical and psychosocial hazards were significant contributors. Greatest variation in predictors of WMSD risk was found at the job level, providing support for risk management to be focussed on jobs rather than at organisation or sector level. This is distinct from a hazard level focus which is the current focus of many risk management strategies. These results support the need for a change to current approaches to WMSD risk management. To accurately identify and control all hazards a toolkit approach is suggested using worker participation to develop appropriate measures to mitigate WMSD risk.

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1. Background

Australia and most other OECD countries report work-related musculoskeletal disorders (WMSDs) as the largest and most costly occupational health and safety (OHS) problem (Marras et al., 2009; Nelson et al., 2005; Safe Work Australia, 2010). Despite significant evidence supporting the link between physical and psychosocial factors and the aetiology of WMSDs (Bernard, 1997; Eatough et al., 2012; Hauke et al., 2011; National Research Council, 2001; Warren, 2001) this knowledge is not often translated into effective risk management practices (Wells, 2009). More commonly, identification and subsequent development of risk controls is focussed only on the physical demands of task performance with relatively little attention to psychosocial factors (Macdonald, 2012a).

Accurate identification of all relevant hazards is the first step in effective workplace risk management of WMSDs. Given the huge variation in operational demands both between and within different industry sectors and their respective organisations, appropriate

targeting of strategies requires careful consideration. Generic risk management strategies may not be appropriate given these large differences. A review of interventions aimed at reducing upper limb musculoskeletal disorders concluded that no single or multi-dimensional strategy was effective across occupational settings, that is a degree of customisation is required for maximum effectiveness (Boocock et al., 2007). This is supported by Tuncel et al. (2008, p. 123) who reviewed interventions in manufacturing and found inconclusive results, but suggested that both physical and nonphysical work environments should be assessed so that interventions specific to individual workplaces can be developed which in turn could lead to more definitive conclusions about changes being reached. A review of interventions in health care supported the need for multi-factorial interventions but did not address the issue of psychosocial factors in relation to MSDs (Tuller et al., 2010). However, the need for improved identification and management of interacting determinants in managing an occupational health issue such as MSDs is generally well supported (MacDonald et al., 2008; Marras et al., 2009).

Although published information is limited with regard to 'real world' risk management of WMSDs, a focus on reduction of physical hazards has been reported (Macdonald and Oakman, 2013;

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Whysall et al., 2004). Several comprehensive reviews (Martimo et al., 2008; Veerbeek et al., 2011) have concluded that interventions focussing only on modification of employees' methods of manual handling are ineffective. Limited evidence exists on interventions to address both psychosocial and physical factors in relation to reduction of WMSDs (Bambra et al., 2007).

Systems approaches, which consider the organisational and sociotechnical context of work activities and processes, are needed to assist with improving approaches to comprehensive management of WMSDs (Carayon et al., 2013). This type of approach will assist with important integration of managing hazards and risks arising at both an organisational and at job level, rather than addressing these issues independently where key relationships between the levels might be missed (Makin and Winder, 2008). An important question arises with regard to the degree to which customisation of risk management processes is required. To date, this issue has not been extensively described in the literature. To improve this situation more effective ways to address risk reduction of WMSDs are needed. This will require systematic risk management to focus on all hazards—including physical and psychosocial—associated with the development of WMSDs. The current study aims to address this need by examining differences in all predictors of WMSDs at a sector, organisation and job level. Sectors are defined as a group of organisations sharing common characteristics comprising a range of jobs. These findings will then be used to inform development of a more comprehensive approach to risk management of WMSDs.

1.1. Predictors of WMSDs

The relative contribution of physical and psychosocial hazards to WMSD development may vary between different jobs, gender and age (Canjuga et al., 2010; da Costa and Vieira, 2009; Eatough et al., 2012; Johnston et al., 2010; Long et al., 2012; Warren, 2001); however, a substantial body of literature demonstrates that both groups of hazards are important. Even in work considered as predominately physical in nature, psychosocial factors have been associated with WMSD development (Lund et al., 2006; Punnett and Wegman, 2004; Simon et al., 2008). The relative importance of particular hazards will be defined by the nature of the work and the physical and cognitive demands placed on individuals and will vary greatly across different organisations and sectors (Marras, 2008). In addition, the organisational and sociotechnical context in which the organisation is operating will influence a range of workplace demands including job security, deadlines and working hours, all of which have been linked to WMSD development (Eatough et al., 2012; Macdonald and Oakman, 2013). Thus, a complex relationship between potential predictors of WMSDs has been described in the literature, providing an indication that approaches to manage risk need to suitably address this complexity (Warren, 2001).

1.2. Current approaches to OHS (or workplace) risk management

The conventional approach to OHS risk management has been to focus on hazard management – identifying hazards, assessing risk from each identified hazard, and taking any necessary steps to control risk from each hazard separately. This approach is appropriate for hazard-specific diseases and disorders such as noise-induced hearing loss, or mesothelioma due to asbestos exposure. However, a more holistic approach is required to achieve effective control of diseases and disorders for which risk is determined by multiple, diverse hazards – as is the case for WMSDs (Macdonald, 2012b).

This focus on individual tasks—usually, hazardous manual tasks—rather than the overall jobs comprised of a series of tasks,

is supported by many of the tools and guidance materials commonly available to ergonomists, and safety specialists, who are often responsible for implementation of risk management in relation to WMSDs. Many of these tools are focussed on identifying hazardous physical aspects of work, and taking measurements at points in time, or specific aspects of individual tasks (Macdonald, 2012b).

Current WMSD guidance materials have limited focus in relation to the contribution of psychosocial hazards in the development of physical disorders such as WMSDs. Guidance material for psychosocial hazards typically covers bullying/harassment, occupational violence and stress (Johnstone et al., 2011) but it is not well integrated with WMSD materials and as a result psychosocial hazards are often managed separately. Even in cases where psychosocial hazards are mentioned, explanation of what they are and how to manage them is limited (Leka et al., 2011), perpetuating the impression that they are of peripheral importance in relation to physical hazards for WMSDs (Macdonald et al., 2003). A review of the processes, barriers and outcomes used by consultant ergonomists to manage WMSDs, provides further evidence that risk reduction strategies are primarily targeted at physical hazards (Whysall et al., 2004).

1.3. Systematic Integrated risk management

Guidance material to promote more effective workplace management of psychosocial hazards has been developed by Leka et al. (2008). However, little has been described in the literature about the implementation and evaluation of psychosocial risk management interventions needed to inform future policy and practice developments (Leka et al., 2010). Some have suggested that to improve the management of risks associated with psychosocial hazards, integration into existing OHS systems is required (Walters, 2011). Guidance on psychosocial risk management has usually been focussed on those jobs with a substantial risk related to mental health problems, rather than jobs where WMSDs are the major issue (Leka et al., 2008). Tools are required that identify and assess WMSD risk from both psychosocial and physical hazards in an integrated manner.

A further deficiency in workplace WMSD risk management is the limited extent to which workers themselves participate in the process, despite evidence of the importance of worker participation in reducing risk (Pehkonen et al., 2009; Rivilis et al., 2008). A major review of European research evaluating workplace interventions to reduce WMSD risk concluded that such interventions were more likely to be effective in reducing WMSD risk if they: (1) were multidisciplinary; (2) involved a participatory approach involving workers and their representatives; (3) enabled interventions to be customised to each individual situation; and (4) had adequate management resourcing (European Agency for Safety & Health at Work, 2008).

A greater focus is needed on the development and evaluation of comprehensive and systematic WMSD risk management materials to address the complex multifactorial development of these disorders. The intent of the current study is to address the first part of this goal: the development of a comprehensive risk management program for WMSDs. To achieve this the current study seeks to address the following questions:

- (1) Are there differences in predictors of WMSD risk such that risk management strategies should be customised separately for:
 - Different industry sectors?
 - Different organisations?
 - Different jobs?
- (2) What are the minimum requirements for effective comprehensive WMSD risk management?

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