Intervention development to reduce musculoskeletal disorders: Is the process on target?

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ABSTRACT

Work related musculoskeletal disorders remain an intractable OHS problem. In 2002, Haslam proposed applying the stage of change model to target ergonomics interventions and other health and safety prevention activities. The stage of change model proposes that taking into account an individual's readiness for change in developing intervention strategies is likely to improve uptake and success. This paper revisits Haslam's proposal in the context of interventions to reduce musculoskeletal disorders. Effective MSD interventions require a systematic approach and need to take into account a combination of measures. Research evidence suggests that in practice, those charged with the management of MSDs are not consistently adopting such an approach. Consequently, intervention development may not represent contemporary best practice. We propose a potential method of addressing this gap is the stage of change model, and use a case study to illustrate this argument in tailoring intervention development for managing MSDs.

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1. Introduction

In his 2002 paper, Haslam proposed that Prochaska and DiClemente's stage of change (SOC) approach might usefully inform ergonomics activities, particularly when advising with respect to health and safety (p.241). This paper revisits Haslam's proposal, focusing more specifically in the context of interventions to reduce musculoskeletal disorders (MSDs). Reviews on the effectiveness of interventions for preventing work related MSDs indicate limited to modest success in many cases (Palmer et al., 2012). The multifactorial nature of MSDs and the associated complexity of their prevention (Denis et al., 2008) are contributors to this. A SOC approach takes into account an individual's readiness to change, which is another contributor to MSDs prevention efficacy. SOC has been widely used in the public health arena to help eliminate individual, negative behaviours such as smoking cessation and reducing alcohol consumption (Heather et al., 2009; Prochaska et al., 1993, 2001). Since 2002, the SOC approach has had limited uptake in the development of MSD interventions despite its apparent appropriateness for helping to address this significant OHS issue

(Rothmore et al., 2013).

Haslam (2002) proposed the SOC model as highly relevant to health and safety issues but with an added layer of complexity. In the workplace, individual readiness to change is reflected in the views of individual workers whereas organisational readiness to change is reflected in the views of company leaders and managers who determine the nature and extent of workplace changes and practices (Haslam, 2002) A further distinction between public health and health and safety applications of the SOC approach relates to individual versus group readiness to change. In public health interventions readiness to change and the subsequent interventions are targeted at the individual level only. In the workplace, while readiness to change is assessed at the individual level, interventions need to account for the range of stages present in the workgroup. Nevertheless, using SOC to develop MSD interventions may assist with more targeted approaches, increase uptake and sustainability of recommendations. In a study of 24 MSD interventions, those targeted to workers' stage of change led to greater behaviour change and a reduction of MSD symptoms than interventions that were not 'tailored' (Whysall et al., 2006a). Barriers to implementing change in workplaces have been widely documented and are often related to broader organisational issues not taken into account when the intervention is designed and

implementation attempted (Whysall et al., 2006b). That is, the response to the problem was not targeted in a meaningful way for those in the organisation to implement the necessary changes to reduce hazards and risk associated with the development of MSDs.

The concept of targeted interventions is aligned with a systems approach endorsed, but insufficiently applied in practice, by ergonomists (Wilson, 2014). A position paper outlining a strategy for the future of ergonomics, developed by a committee of International Ergonomics Association (IEA) members recommended several professional issues of pertinence to the current paper. The authors suggested that whilst ergonomics has great potential to enhance performance and wellbeing through system design, at present this is only done to a limited extent (Dul et al., 2012). They argue that whilst ergonomics has the potential to provide value to key stakeholders in systems design or work organisation, the perceived value is limited (Neumann and Dul, 2010). Therefore, there is a reticence to engage and then adopt changes recommended by ergonomists. A further observation was that relationships developed by ergonomists engaged to make recommendations to organisations were often established with people without sufficient influence to make, and sustain, the necessary changes. This suggests a need for a more nuanced language and better engagement with those who can make decisions if we are to make substantial improvements in reducing MSDs.

A SOC model posits that underlying knowledge, attitudes and beliefs are linked to the behaviour and actions of managers, supervisors and workers (Haslam, 2002). These attitudes and beliefs are then strongly influential on the ultimate success of an intervention and go some way to addressing the issues outlined by Dul et al. (2012) around engagement and the current limited uptake of interventions by organisations.

In this paper we will explore the role of SOC in the development of effective interventions to reduce MSDs and argue it is time to revisit the concepts proposed by Haslam in 2002, including considering the merits of participative ergonomics, safety culture and behaviour based safety as they relate to MSDs. We move on to suggest that taking into account SOC provides a method to identify organisational and individual barriers and facilitators to intervention design, implementation and reduction of MSDs. If we are to address the difficult and seemingly intractable problem of poorly targeted workplace initiatives, which fail to succeed in reducing the very high numbers of MSDs, a SOC approach may offer a way to support this goal.

2. MSD interventions

MSDs are a large and costly problem impacting individuals, industry and society (Murray et al., 2012). Furthermore an ageing population will mean increased pressure to work for longer, for income and to provide an adequate labour force (Harma, 2011), prolonging exposure to existing MSD risks. Reducing the current high numbers of MSDs is a critical part of this complex societal issue to ensure people are physically able to sustain a longer working life should they choose to, and that labour supply needs can also be met.

Workplace interventions to address MSDs have reported some successes (Silverstein and Clark, 2004; Denis et al., 2008; Palmer et al., 2012). However, these successes are modest and the "MSD problem", remains largely unresolved (Wells, 2009). Two questions posed by Wells were: "How effective are the recommended interventions in actually reducing MSDs in the workplace?" and, "How intensely and widely implemented are workplace interventions to prevent MSDs?" These questions suggest there is a gap between what is identified as needed and the actual uptake of the advice provided to the organisations. An 'evidence to practice'

gap is a potential contributing factor to these issues (Rothmore et al., 2013; Chung and Shorrock, 2011).

Despite an extensive evidence base, which supports the role of psychosocial and physical factors in MSD development, interventions to reduce the incidence of MSDs continue to focus primarily on the latter (Macdonald and Oakman, 2015; Oakman et al., 2014; Eatough et al., 2012; Gerr et al., 2014). In addition, systematic reviews analysing the effectiveness of interventions consistently report that multifactorial approaches are needed which take into account a range of relevant factors, but that this is not always borne out in practice (Westgaard and Winkel, 2011; Silverstein, and Clark, 2004). These two factors, consideration of psychosocial risk factors and the implementation of multiple control measures, provide an important basis for effective intervention design.

Apart from the design, the nature of the intervention is important. As Haslam (2002) and others (Polanyi et al., 2005; Village and Ostry, 2010) mention, the knowledge, attitudes and beliefs of managers, supervisors and workers greatly influence the impact of advice provided by the ergonomist. The principle of targeting MSD interventions for a specific audience is well understood (Urlings et al., 1990; DeJoy, 1996; Haslam, 2002) and MSD intervention research reports on different approaches for achieving this. Participatory ergonomics programs are one approach commonly associated with MSD intervention development (Wilson et al., 2005) and such approaches have been found to be somewhat successful (Carrivick et al., 2005; Cantley et al., 2014). Targeting of interventions at multiple levels, including individual and the organisation are also critical to achieving sustainable improvement (Amick et al., 2009), while more recently consideration of organisational safety climate or health and safety culture has also been considered in targeting interventions (Lee et al., 2010; Tappin et al., 2015).

3. Participative ergonomics approach

A participative ergonomics approach draws on a long history of employee involvement research conducted for different reasons (e.g. industrial democracy, change management), and in different domains (e.g. product design, action research). The intentions of a participative ergonomics approach are well established. Interventions that are developed and applied by people involved with the work system are more likely to be appropriately designed and more widely accepted as a result (Wilson et al., 2005). People may also feel greater ownership and engagement through being involved in the change process, are able to identify and address implementation barriers along the way while also having opportunities for personal development (Wilson et al., 2005). A participative ergonomics approach is appealing for MSD prevention, where defining workable interventions can require an intimate understanding of the work system in which they will be applied, and where their implementation can be heavily nuanced by organisational precedence and custom (Hignett et al., 2005). Additionally, as interventions are more likely to succeed when implemented simultaneously (Silverstein and Clark, 2004), a participative approach can be of value in taking ownership of the possibly highly complex implementation process (Gyi et al., 2013).

The effectiveness of participative programs is dependent on the approach that is taken, including whether the participation is meaningful or simply pays lip service to the principles. Additionally, factors such as resistance to participation, maintaining support over time, and mismatches in expectations can all be disruptive to programs (van Eerd et al., 2010). Vink et al. (2006) and Wilson et al. (2005) both describe a number of success factors for participation programs, among which stakeholder partnerships, management