



## Review article

# Barriers for implementation of successful change to prevent musculoskeletal disorders and how to systematically address them

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## ABSTRACT

This scoping review identified common barriers and facilitators encountered during the implementation of changes to prevent musculoskeletal disorders (MSD) and examined their relationship with those encountered in general Occupational Health and Safety (OHS) efforts. Thematic analysis of the literature identified 11 barriers: (i) Lack of time; (ii) Lack of resources; (iii) Lack of communication; (iv) Lack of management support, commitment, and participation; (v) Lack of knowledge and training; (vi) Resistance to change; (vii) Changing work environment; (viii) Scope of activities; (ix) Lack of trust, fear of job loss, or loss of authority; (x) Process deficiencies; and (xi) Difficulty of implementing controls. Three facilitators identified were: (i) Training, knowledge and ergonomists' support; (ii) Communication, participation and support; and (iii) An effective implementation process. The barriers and facilitators identified were similar to those in general OHS processes. The integration of MSD prevention into a general management system approach may overcome these barriers.

## 1. Introduction

Musculoskeletal disorders (MSD) represent a set of pathological conditions that impair the normal functions of the soft tissues of the musculoskeletal system. MSD occur when soft tissues are subjected to repeated physical stress that causes gradual accumulation of tissue damage (NRC, 2001). A broad range of physical, psychological, and work organizational risk factors have been increasingly linked to MSD, reducing the overall health and well-being of workers (NRC, 2001; Cole et al., 2006). Prevention of these disorders should be seen as a high priority. However, implementation of individual controls for MSD hazards or the development of an effective and sustainable prevention program for MSD in the workplace is not a simple task (Wells, 2009).

An array of challenges and barriers exist during the implementation of an intervention to prevent MSD. The terms “challenge” and “barrier” were used interchangeably throughout the literature. These terms are defined as factors that hamper the implementation of activities to prevent MSD (Koppelaar et al., 2009). Organizations may feel intimidated and are thus hesitant to intervene or develop an MSD prevention program. The scientific literature also identified facilitators that assist with the successful implementation of MSD prevention activities. Facilitators are defined as factors that enhance the implementation of

MSD prevention activities (Koppelaar et al., 2009). Note that this may be through the development of an ergonomics program, such as a Participative Ergonomics (PE) program or through an Occupational Health and Safety Management System (OHSMS), or by impacting engineering product and process design practices.

Yazdani et al. (2015 a,b) highlighted the importance of integrating MSD prevention into management systems and the positive impacts integration may have in reducing workplace injuries. These studies argue that there is a need for better understanding of challenges and barriers that organizations face to integrate MSD prevention activities and strategies into management systems. Therefore, the purpose of this review was to identify the common barriers experienced during the implementation of MSD prevention activities, as well as determine facilitators for the implementation process. We also examined how barriers identified in this review related to those encountered in more general Occupational Health and Safety (OHS) efforts. In addition, possible scenarios to overcome these challenges were explored and discussed.

## 2. Method

Researchers have created and employed a variety of methods in

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which to synthesize evidence and address gaps in knowledge. One of the approaches that has emerged, the “Scoping Review”, provides a comprehensive approach to evidence synthesis which maps the key concepts to examine research questions and evidence. Using a framework by Arksey and O'Malley (2005), we had three reasons to use scoping review methodology: First, to examine the extent, range, and nature of research activity into exploring the barriers and facilitators to implement successful changes; Second, to summarize and disseminate research findings to inform researchers, policy makers and practitioners; and third, to identify possible gaps in the existing research literature. The data contained in this study was non-sensitive, did not involve human participants, and stemmed from secondary research; thus, ethics approval was not required.

### 2.1. Review process

The process used in this review involved the following steps: (a) the research questions were clearly determined by the research team; (b) the selection criteria were outlined; (c) keywords were defined; (d) appropriate databases were selected; (e) search strategies were finalized; (f) the literature search was conducted; (g) relevant studies were obtained; (h) the evidence was extracted and the data was tabulated; and (i) the results of the review were summarized.

### 2.2. Research question

What are the challenges and barriers to, and facilitators of, successful implementation of changes to prevent of MSD in the workplace?

### 2.3. Search strategy

The concepts of musculoskeletal disorders, interventions, workplace, and barriers were searched for using a variety of title, abstract, keyword, and indexing terms. The search strategy used in this review combined three sets of keywords using the Boolean operator “AND” and the keywords within each group were combined using the “OR” Boolean operator. In addition, the reference lists of documents were manually searched to include those meeting the inclusion criteria. The first set of keywords were: musculoskeletal disorders (MSD), ergonomics, low back pain, cumulative trauma disorders (CTD), upper extremities, repetitive strain injuries (RSI), musculoskeletal injuries (MSI), back pain, neck pain, shoulder pain, strains, back injuries, and occupational injuries. The second set of keywords include: intervention, prevention and control, participatory program, employee, worker, occupational health and safety management system (OHSMS), and program. The following keywords were used as the third set of keywords: barriers, facilitators, obstacles, problems and solutions, and organizational difficulties. The keywords were searched in the titles, abstracts, and topics of documents. A title and abstract that contained one term from each group of keywords were considered to be eligible for this review. Articles regarding drugs, surgery and rehabilitation were searched for and excluded from the final results in each database.

### 2.4. Literature search

The searches were conducted in a number of databases and search platforms including Medline, EMBASE, Scopus, and Health & Safety Science Abstracts. These databases include a wide range of journals in the fields of health, business, management, and science. Results were limited to English articles only and no date limits were applied.

### 2.5. Selection criteria

This review included peer-reviewed journal articles and conference papers highlighting the barriers and facilitators for the successful prevention of MSD. We included publications up to December 2016. Publications not written in English were excluded from this review.

### 2.6. Review process

Three reviewers were involved in the review process. First, 50 papers were randomly selected by the lead reviewer and divided between the two other reviewers. All three reviewers reviewed these articles to pilot test the screening tool. The screening tool was modified based on reviewers' feedback. Then, the title and abstract of each article was reviewed by two reviewers and an additional reviewer was asked to repeat the process for those articles that the reviewers could not make a decision on relevancy or those that reviewers could not reach consensus. The final decision on each paper was made by consensus. This process was repeated throughout all steps of this review including data extraction and synthesis of information. Using a thematic analysis approach (Thomas and Harden, 2008) the results of this review were coded, summarized, and presented.

## 3. Results

The literature searches in the databases resulted in a total of 4022 articles (Medline: 1068; EMBASE: 1134; Scopus: 1558; and Health and Safety Science Abstracts: 262). All results were exported into a RefWorks account. Duplicate records were searched for in the account and deleted, leaving 3686 unique records. The review process led to 88 papers for data extraction. Table 1 provides an overview of included articles. The papers included in this review were grouped into two main themes including “challenges and barriers” and “facilitators”. Within each main theme, several sub-themes were identified from the thematic analysis (Table 2).

### 3.1. Barriers to successful prevention of MSD

This review found many barriers that affect the successful implementation of individual controls or an MSD prevention program in the workplace. The barriers were categorized into eleven main themes including: (i) Lack of time; (ii) Lack of resources; (iii) Lack of communication; (iv) Lack of management commitment, support, and participation; (v) Lack of knowledge and training; (vi) Resistance to change; (vii) Changing work environment; (viii) Scope of activities; (ix) Lack of trust, fear of job loss or loss of authority; (x) Process deficiencies; and (xi) Difficulty of implementing controls. The following paragraphs describe the barriers and challenges for successful prevention of MSD.

#### 3.1.1. Theme I: lack of time

The literature frequently identified lack of time as a challenge to implementing MSD prevention activities in the workplace. Some studies noted that although a workplace team was appointed with responsibility for the MSD prevention program, team members acknowledged limited time available for the program due to responsibilities for other programs and activities (Penteado et al., 2012; Rosecrance and Cook, 2000; Haims and Carayon, 1998). A study conducted in a hospital evaluated the challenges of implementing an ergonomics committee to champion interventions (Bolis and Sznalwar, 2016). This study concluded that committee members considered their committee positions secondary to their main responsibilities (Bolis and Sznalwar, 2016). They suggested that all hospital staff need to be accountable for ergonomic interventions in order to properly disseminate them, which would require more time to be dedicated to ergonomics training and analysis; a similar situation has been reported in a manufacturing setting (Bolis and Sznalwar, 2016; Yazdani et al., 2015). The barrier of a lack of adequate time is highly related to resource allocation, which is described in the next theme.

#### 3.1.2. Theme II: lack of resources

Lack of resources (e.g. finances, equipment, staff, etc.) was identified as one of the most common challenges to the implementation of

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