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Introduction to Special Section: Systematic Reviews for Prevention and Management of Musculoskeletal Disorders

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Introduction

There has been renewed interest in the integration of occupational health and safety (OHS) prevention programs and rehabilitation or disability management programs. Frank and Cullen [1] suggested it was important to consider occupational prevention from a more integrated perspective, combining primary prevention and secondary prevention. A decade earlier, Habeck [2] and Hunt [3] made similar arguments. More recently the idea of an integrated approach has received further support by Punnett [4], Pennachio [5] and Davis [6]. Safety programs such as active safety leadership, training, and diligence can be understood only alongside proactive return-to-work programs and disability case management programs. Ergonomic programs and practices straddle the primary and secondary prevention elements of workplaces. However, OHS prevention programs and rehabilitation or disability management programs often remain separate academically in scientific journals and practically in businesses. This special section of this issue of the *Journal of Occupational Rehabilitation* (*JOOR*) presents some recent outcomes of a program of research conducted by the Institute for Work & Health (IWH) in Toronto, Canada, to focus on synthesizing evidence from the scientific literature on OHS prevention, rehabilitation and disability management.

The systematic review program was developed to create an evidence base for decision-making. The program was launched in response to the concern, raised by non-research partners in the Ontario prevention system, that there was limited accessible evidence about the effectiveness of interventions for protecting workers' health. Even when adequate evidence existed, stakeholders found it difficult to understand and felt that it was not presented in a language or a format suited to non-scientific audiences. This situation potentially inhibited the implementation of research findings in workplace OHS [7].

A systematic review (SR) is a research project that focuses on answering a question about the current evidence on a topic by identifying, appraising, and summarizing the results of primary research from the scientific literature. An SR focuses on reducing bias by using replicable, scientific, and transparent methods. The results of an SR can inform decision-makers including clinicians, occupational health practitioners, researchers, consumers, and policy-makers by providing an up-to-date summary of the current evidence on a topic.

This introductory piece provides a brief overview of the approach used for each of the reviews that follow. The review process outlined was used for each review, but each team made decisions to address the process uniquely as the challenges of the individual review demanded. Our hope is that these reviews collectively lay a foundation for a broader integration of research findings on intervention effectiveness that can be shared between research and practice communities.

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IWH Systematic Review Approach

The approach outlined below includes many of the guiding principles of the Cochrane Collaboration model of reviews [8] and have evolved over the course of 22 reviews. The stages and steps of our review process are presented in Fig. 1 below.

Stage 1: Topic Selection

a. Topic Generation

Yearly, the IWH conducted comprehensive stakeholder consultations with representatives from among our prevention partners. Designed to generate a list of priority topics for review, the consultations gave stakeholders and researchers the chance to suggest topics or to offer views about emerging trends or issues. Once a topic was approved, a review team was struck. Each multidisciplinary team typically included researchers, library staff, knowledge transfer and exchange staff, content experts, methodologists, clinicians, and, where appropriate, stakeholders.

b. Existing review/literature identification

Once a topic was suggested and a review team formed, IWH researchers and library staff searched the literature to ensure there were sufficient articles to proceed with a full review, and that there was not already an existing review on the topic selected.

Stage 2: Conduct the Review

c. Research question

The first step in conducting the review was for the entire research team and relevant stakeholders to develop the research question. The goal was to develop an explicit question that was relevant and that could be answered from the literature available.

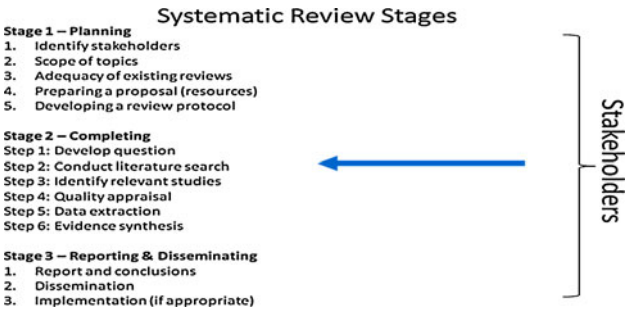

Fig. 1 Institute for work and health (IWH) systematic review process

d. Search development and execution

Once the research question was developed, the library team created the literature search strategy with input from the research team and those stakeholders who had been involved in crafting the research question.

e. Relevant document(s) identification

Titles and abstracts retrieved through the search strategy were screened using pre-determined inclusion/exclusion criteria. The goal of this exercise, as with all steps in the process is to minimize all potentials for bias. If it was not possible to judge the relevance of an article from its abstract or if an abstract was not available, then the full article was retrieved for screening. Typically, two reviewers independently review titles, abstracts, and full articles before coming to consensus about relevance for answering the review question to minimize potential bias. Where consensus could not be reached a third reviewer would be consulted. This practice varies only when a search generates a large number of references. In such cases titles and abstracts may be assessed by single reviewers for practical reasons. When this happened the application of relevance criteria were pilot tested and discussed among reviewers again to minimize potential bias.

f. Quality appraisal

Articles that met the inclusion/exclusion criteria were then appraised for their quality. An assessment tool was chosen or developed *a priori* by the team, with each element of the tool selected through a team consensus process. Those articles that met or surpassed the quality threshold (also decided *a priori*) were put forward for data extraction. Two reviewers independently reviewed the articles and came to consensus about the quality.

g. Data extraction

Data necessary to answer the research question were extracted from the articles by reading and recording details from each article using predetermined categories, e.g. intervention type, population, country. The extracted data were used to build summary tables used for evidence synthesis and to develop overall conclusions. As in previous steps, two reviewers independently extracted the data from the articles and then came to consensus.

h. Evidence synthesis

Because there is a high level of heterogeneity in the prevention literature, the majority of our reviews used a "best evidence synthesis" approach, which was adapted from Slavin et al. [9]. This approach considered each article's quality, the quantity of articles using the same prevention strategy, and the consistency of the findings.

We have attempted to unify the levels of evidence across our reviews so that our stakeholders may consistently interpret our findings.

Stage 3: Reporting and Dissemination

Once the review was complete, our stakeholders were given the opportunity to comment on the clarity of our reports and recommendations before we finalized our reports. This ensured that our reviews were practical and relevant to our stakeholder community. Once the report was finalized, a lay summary of the report, branded as "sharing best evidence", was created; it was distributed broadly to our stakeholder groups and posted with the report on our website [10]. The review team then created a manuscript to submit to a peer-review journal so that the results could be communicated to our scientific audience. Each review was also submitted to a number of relevant conferences for dissemination within our research and non-research community.

The review process described here continues to evolve. We are expanding and adapting our methodologies to see if there are better and more efficient approaches to synthesizing the evidence available in the prevention literature. The search techniques continue to evolve as the body of prevention literature grows and the number of prevention topics increase. Our research team is currently considering adjustments to, and validation of, the quality appraisal and data extraction steps of completing a review. Some of these adjustments have come in response to the challenge of summarizing evidence when the literature is heterogeneous. Many review teams had productive discussions and debates about the role of observational studies in determining intervention effectiveness [11] and the role of randomized trials [12].

In addition, we are continuing to expand and evaluate our approaches to stakeholder engagement and research dissemination. Systematic review teams striving to identify the "best available evidence" have had to contend with differences among different practitioner communities concerning what constitutes "best". Specifically there have been extensive discussions about what evidence must be present for appropriate recommendations to be made. This process of discussion and improvement is ongoing.

Description of Reviews

The systematic reviews discussed here represent a variety of perspectives on the scientific literature examining OHS prevention and rehabilitation or disability management. Some focus on a particular sector (health care) or component of the labour market (small business). Two approaches are presented for synthesizing the research literature on small businesses. The reader will be able to ascertain the value of conducting both quantitative (Breslin) and qualitative (MacEachen) systematic reviews.

Kennedy examined the evidence for the prevention and management of upper extremity disorders. The economic evaluation of ergonomic interventions is another important topic to stakeholders. Tompa provides an in-depth evidence synthesis of this small but growing body of evidence. Finally, Tullar's review examines OHS interventions aimed at preventing musculoskeletal injuries in the health care sector and demonstrates that multi-component interventions for handling patients can be evaluated if the term "multi-component" is clearly defined at the outset and consistently applied.

Together these reviews explore a broad evidence base to provide recommendations for practice. These recommendations are presented with each review. These reviews also invite us to consider where there are needs for further research and opportunities for testing novel approaches. As funding agencies seek to support more translational research and comparative effectiveness research, the evidence in these reviews can provide an important yardstick of success to date.

Conclusion

The reviews presented here are products of an innovative and evolving systematic review program that summarizes the scientific literature on OHS prevention, rehabilitation, and disability management. These Prevention Reviews are practical, building on other review methods such as the Cochrane Collaboration. They increase our experience with the prevention literature and emphasizes careful attention to maintaining transparency and minimizing bias. The resulting review process has been adaptable to a number of topics in the prevention literature, to various study designs, to both quantitative and qualitative methods, to effectiveness and process of interventions, and across various review teams.

By engaging stakeholders in the review process, the program has managed to respond to their feedback and priorities by providing summaries of the scientific evidence that are straightforward and accessible. We have accomplished this without abandoning scientific rigour, as we have maintained a strong focus on reducing bias, using replicable approaches, and being transparent about the methods and findings.

All of the reviews presented here follow the basic review stages and steps that we have outlined in this article. This, we believe, testifies to the adaptability of our approach. What makes each review unique is then not the

broad approach but the content area, the nature of its stakeholder input, and the multidisciplinary composition of the review team. Moreover, because the underlying approach is essentially the same, we have been able to extract messages across the body of reviews, enabling readers to make informed judgments about a variety of prevention activities across the literature.

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