

## Factors for success in participatory ergonomics

Participatory ergonomic (PE) programs or interventions are considered helpful in reducing work-related injuries to muscles, tendons, ligaments and other soft tissues. These injuries, also known as musculoskeletal disorders (MSDs), are one of the key causes of work absence.

A participatory ergonomic program involves key players from the workplace in problem-solving, planning and controlling a significant amount of their work activities. With most PE programs, some type of team or committee forms. They usually receive training in ergonomic principles and use this knowledge to make improvements.

A previous systematic review from the Institute for Work & Health (IWH) found some evidence that PE interventions had a positive impact. They reduced musculoskeletal symptoms, injuries and workers' compensation claims, and lost days from work or sickness absence.

When we consulted with practitioners, policy-makers and others who use research, they said this review was helpful. However, they expressed interest in a research summary describing how to implement a PE program with regard to processes, facilitators and barriers. To address this request, this current review set out to answer the following question:

*“What is the evidence regarding context, barriers and facilitators to the implementation of participatory ergonomic interventions in workplaces that have the intent of improving worker health by attempting to make changes in: i) work processes, ii) work tools & equipment, and/or iii) work & workplace organization?”*

### Key messages

To increase the likelihood of a successful participatory ergonomic (PE) program:

- Create PE teams with appropriate members, including workers, supervisors and advisors
- Address key facilitators/barriers, such as management support and resources for the program
- Involve the right people from the workplace in the overall PE process
- Provide ergonomic training
- Involve a PE champion to guide and monitor the process
- Define participants' responsibilities, which usually include problem-solving, developing solutions and implementing change
- Make decisions using group consultation.

### How was the review conducted?

With the IWH Systematic Review Program, we have consistently involved practitioners and others who use research in decision-making to make sure each review is relevant. For this review, we held meetings with stakeholders in Ontario, Manitoba and British Columbia. We also included a practicing ergonomist as a member of our review team.

This systematic review differs from previous reviews for several reasons. First, this review examines the *process* and *implementation* of PE interventions. It doesn't look at whether a PE intervention is effective at reducing workplace injuries. For this reason, we needed detailed information describing how a PE intervention was set up. To do this, we adapted the quality

requirements typically used in a systematic review. Given the topic and adaptations, this review doesn't use "evidence synthesis," an approach that considers the quality, number and consistency of studies supporting a program's effectiveness. Instead we described the endorsement – or number of documents – that support key aspects of the PE process.

Also, we included studies from peer-reviewed journals that described practice and interventions, even if a scientific evaluation was not described. Finally, we explored the grey literature. This includes conference proceedings, books and book chapters, technical documents and other reports not published in peer-reviewed journals. Our stakeholders felt that these documents would contain rich, detailed information.

Our review team searched 17 electronic databases to find documents to help us answer the review question. Content experts were also asked to provide documents on this topic. Grey literature was also searched using academic websites, selected conference proceedings and institutional reports.

Initially we identified 2,151 documents. These documents were reviewed to see which ones were relevant and had enough information to answer the review question. After this stage, 256 documents remained for quality review. Reviewers used seven criteria to get a consistent indication of the document's quality. Of these 256 documents, 52 met our criteria. In the next phase, we summarized several key aspects of the intervention from these documents. These aspects included the context of the intervention (such as the sector and country), organizational structure, ergonomic training, process, facilitators and barriers and the reported effectiveness. To summarize information on the process, we used the PE Framework proposed by Helen Haines and colleagues.

For this phase, we also created a list of facilitators and barriers. These are: workplace climate, creation of a team, ergonomic training/knowledge, organizational training, resource availability,

awareness of the PE intervention, support of the PE intervention, development of a detailed plan, production requirements, personnel turnover, working relations, nature of work, communication, change resistance or ability, a PE champion, history of interventions, impact of research methods, ease of changes and any other reported facilitators/barriers.

### What were the main findings?

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Of the 52 documents, 33 were peer-reviewed and 19 were grey literature. Most documents reported on PE interventions in Canada or the U.S., followed by the Netherlands and Sweden. Australia, Finland, Iran and Japan were also among the countries represented.

In total, 60 per cent of the interventions took place in the manufacturing sector. The rest occurred across a variety of sectors. Notably, health-care, public administration and construction were each the setting in about 10 per cent of the documents. In about half of all documents, the reasons for having a PE intervention were injury rates and absenteeism, and return-to-work issues.

The following recommendations are based on the information from these documents. Each recommendation arises from the description and endorsement, and takes into account consistency across the documents. We also consider information on facilitators and barriers for each recommendation. We feel that these recommendations apply broadly as they are based on documents from multiple locations and different work sectors.

### What are the key recommendations?

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#### **Create teams with appropriate members**

A team is an important aspect of PE programs. In most documents we reviewed, some type of team formed. In many cases there was more than one kind of team. The type of team seems flexible and depends on the needs of each workplace. Teams could be steering committees, change teams

across departments, or department/workgroup teams. Regardless of the nature of the team, having appropriate members such as workers, supervisors or advisors is important. Creating the right team was often described as a facilitator – or as a barrier – if the makeup of the team wasn't addressed. Issues of communication, support of PE programs and including a PE champion in the process emphasizes the need to have appropriate people on the PE team.

### **Address key facilitators/barriers**

To increase the chances of a successful program, it is important to be aware of potential facilitators and barriers in initiating and putting the PE program into practice. The facilitators and barriers that were mentioned most often, and should be considered, were:

- management support of the PE intervention
- ergonomic training (which is a separate recommendation)
- resources such as staff time, funds or materials
- creating an appropriate team (also a separate recommendation)
- communication levels
- organizational training/knowledge in general areas such as team-building skills

It is also important to be aware of other potential facilitators and barriers. PE programs should be adapted to specific workplaces. Each workplace has its own risk factors for injury.

### **Involve the right people from the workplace in the overall PE process**

The PE team will likely ask others in the workplace for feedback, guidance or information about their work tasks during the PE process. Beyond the PE team, it is important to establish who else will be involved in these consultations. Our review found that other than workers, supervisors and internal or external specialists or advisors were key actors in the overall process. These participants likely represent the right mix of skills or knowledge to help the PE process move forward.

### *What is a systematic review?*

A systematic review is a type of study. It aims to find an answer to a specific question using existing research studies. Reviewers assess many studies, select relevant, quality studies, and analyze the results. The review normally includes the following steps:

- determine the review question
- develop a search strategy and search the research literature
- select studies that are relevant to the review question
- assess the quality of the methods in these studies and select studies of sufficient quality
- systematically extract and summarize key elements of the studies
- describe results from individual studies
- combine results and report on the evidence

To help shape the review question and frame our findings, we rely on feedback from non-research audiences who are interested in the specific topic.

The Institute for Work & Health has established a dedicated group to conduct systematic reviews in workplace injury and illness prevention. Our team monitors developments in the international research literature in this field and selects timely, relevant topics for review.

We appreciate the support of the Ontario Workplace Safety and Insurance Board (WSIB) in funding this four-year Prevention Systematic Reviews initiative.

### **Provide ergonomic training**

Another important element of the PE process is ergonomic training, which was described in most of the documents. Often, it was specifically mentioned as a facilitator, or else as a barrier if it wasn't sufficiently provided. Ergonomic training usually addresses many other facilitators related to the PE process. These include having a detailed plan for the PE process, identifying easy changes to make first, as well understanding the nature of work and production requirements. The nature of the training is flexible. It can be tailored to specific workplace risks/hazards or targeted solutions. Ergonomic training can be delivered by an ergonomist or other professional to workers, the PE team and supervisors.

## Involve a participatory ergonomic champion

An ergonomic champion was involved in most PE interventions. This person's exact role varied, but usually involved multiple tasks or duties emphasizing the importance of the role. This role was most often held by an ergonomist, but it could also be taken up by others in the workplace or by a researcher. The champion would essentially guide and monitor the PE process.

## Define participants' responsibilities

The following responsibilities were essential for participants involved in the process: identify the problem, develop solutions and implement change. The tasks of initiating, guiding and monitoring the PE process were not considered the responsibility of the participants as often. This might be because the PE champion often took charge of these tasks.

## Make decisions using group consultation

Most often, decisions were made through group consultation. This approach suggests that the group makes decisions on what needs to be done, and management gets involved in any decisions on resources and implementation. This appears to be a realistic way of progressing toward change in a workplace setting. Facilitators such as communication, working relations and workplace climate were highly supported and are important to this type of decision-making.

## What were some other issues that emerged?

Overall, we believe that better reporting is needed on some basic process issues. There could have been more consistent reporting of details such as the steps of the intervention, the length and nature of training sessions or the presence of a PE champion.

The focus of a PE program is by nature something that should be defined by the PE team. The interventions we reviewed showed more emphasis on tools/equipment and work processes. However, this is not necessarily an endorsement for these features in all PE programs. These types of changes may be easiest to identify and alter.

Should PE interventions be ongoing or temporary? More of the documents reported ongoing interventions, and we believe this is desirable. However, the decision to have a permanent program may be based on the nature of the workplace, types of risk factors and the workers involved.

## Conclusions

Our goal in this review was to identify the processes, facilitators and barriers to implementing PE interventions in workplaces. In addition to addressing our review question, we make practical recommendations to increase the likelihood of a successful PE process. The recommendations were endorsed in 52 documents from both the peer-reviewed literature as well as grey literature. These documents provided a rich source of detail on PE processes. We feel our recommendations apply broadly, as the PE processes we looked at were from many different countries and a range of work sectors.

These findings are based on the review *Report on process and implementation of participatory ergonomic interventions: a systematic review* by Dwayne Van Eerd, Donald Cole, Emma Irvin, Quenby Mahood, Kiera Keown, Nancy Theberge, Judy Village, Marie St. Vincent, Kim Cullen and Heather Widdrington.

The full report is available at:  
[www.iwh.on.ca/sr/systematic\\_review.php](http://www.iwh.on.ca/sr/systematic_review.php)

Further details on the PE Framework described in this review can be found in *Validating a framework for participatory ergonomics (the PEF)* by H. Haines, J.R. Wilson, P. Vink and E. Koningsveld. 2002; *Ergonomics*, volume 45, number 4, pages 309-327.

*Sharing Best Evidence* is prepared by the Knowledge Transfer & Exchange staff at the Institute for Work & Health. Each issue is available on our website. To be notified of new issues, send a request to [info@iwh.on.ca](mailto:info@iwh.on.ca).

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