



## **Editorial**

Scand J Work Environ Health [2018;44\(2\):111-112](#)

doi:10.5271/sjweh.3710

### **Ergonomic interventions and prevention - a need for better understanding of implementation**

by [Takala E-P](#)

**Affiliation:** Finnish Institute of Occupational Health, Helsinki, Finland.  
[Esa-Pekka.Takala@ttl.fi](mailto:Esa-Pekka.Takala@ttl.fi)

Refers to the following texts of the Journal: [2018;44\(2\):113-133](#)  
[2018;44\(2\):219-223](#) [2017;43\(6\):526-539](#)

The following article refers to this text: [2019;45\(3\):316-317](#)

**Key terms:** [editorial](#); [ergonomic intervention](#); [ergonomics](#); [evidence synthesis](#); [implementation](#); [prevention](#)

This article in PubMed: [www.ncbi.nlm.nih.gov/pubmed/29355290](http://www.ncbi.nlm.nih.gov/pubmed/29355290)



This work is licensed under a [Creative Commons Attribution 4.0 International License](http://creativecommons.org/licenses/by/4.0/).

## *Ergonomic interventions and prevention – a need for better understanding of implementation*

The essential aim of occupational safety and health is to protect workers against negative consequences of work. The logic of prevention is based on the following assumption: If you can identify risk factors having causal association with a disease, and then remove or reduce these factors, the occurrence of the disease should decrease. Because interventions for the reduction of risk factors require resources and can sometimes be harmful, we are able to acquire empirical proof of the benefits of actions in the era of evidence-based medicine. The results of individual trials vary and therefore systematic reviews achieve the best evidence. In this issue, Stock et al (1) review the effects of commonly recommended organization interventions against work-related musculoskeletal disorders. In their selection of studies, they have followed the generally accepted standard of excluding studies with potential high bias. The reports selected for analysis included two studies of high and nine of medium quality; ie, eleven studies with estimated low or medium risk of bias. The results showed moderate evidence of the effectiveness of supplementary rest breaks investigated in four studies. The other interventions included did not show similar benefits and the authors state, eg, that "... participatory ergonomic (PE) interventions are not more effective than work activity as usual ..." in reducing the outcome measures of musculoskeletal disorders.

How should we interpret the results? Breaks obviously reduce continuous long lasting physical activity that is known to be a risk factor for musculoskeletal disorders. Ergonomic interventions are also intended to reduce the occurrence of risk factors at work, and a reduction in exposures was seen in some of the included studies. Is there a fallacy in our theory of effective prevention via reduced exposures? Or is it so that we cannot prevent work-related musculoskeletal disorders with means other than rest breaks?

Systematic reviews aim to find out results that are more general than those of individual studies. For the proof of the existence of white ravens, it is sufficient to show just one. But for the non-existence we have to study all ravens, or a great number of them, in order to formulate our statement that the probability to find white ravens is low. In a systematic review based on a limited number of studies, we can summarize positive findings as follows: "we have moderate evidence that it is possible to reduce musculoskeletal disorders with rest breaks". And about the ergonomic interventions, we can obviously state that "we have insufficient evidence that PE interventions in general are more (or less) effective than work activity as usual". Lack of evidence on effects does not mean evidence on lack of effects. Of the studies included in this review, we can well state that these particular interventions were not effective in the prevention of musculoskeletal disorders.

Stock et al (1) have tried to avoid potentially biased studies by selecting reports using clear quality criteria. Within a limited number of research, inclusion of studies of moderate quality obviously tells us more than including only the studies with perfect quality points, but these were not found. In the discussion, the authors have pointed several explanations for the results they found, like co-interventions or poor attrition in the follow-up. Deeper investigation of the selected reports shows that the impact of the interventions in the reduction of risk factors has obviously been low, although the reduction of exposures has not been properly measured in most studies. In real life, management and not the researcher controls the implementation of workplace interventions. Moreover, researchers cannot prevent workplaces from implementing other interventions in the comparison group, which may reduce the contrast between the groups and reduce the statistical power of the study.

Ergonomics aims not only to reduce health risks but also to improve overall system performance of the workplace (2). Often the potential of positive effects to reduce harmful workload by ergonomic means has been sacrificed in favor of increased productivity (3). Work life seems to be continuously changing, with new demands placed on workers. In this issue, Framke et al (4) describe an intervention aimed at improving the psychosocial working environment in municipal pre-schools by focusing on the processes and performance of core job tasks (4). In each intervention workplace, a steering group including workplace representatives and a pedagogical leader was formed to develop and guide intervention activities. When compared to the workplaces without an intervention, a reduction in risk of short-term sickness absence was seen in the two-year intervention period, but the general well-being was not affected. The scores describing unnecessary, unreasonable, and illegitimate tasks remained unchanged in the intervention group but increased in the control group. The results show that it is obviously possible to reduce harmful effects of changes in work through participative intervention.

An international group of prominent researchers in this field recently proposed a framework that will help to identify pitfalls in the planning and performance of future studies (5). Implementation seems to have been a weak point in the performance of interventions. Most systematic reviews end with the statement that we need more good quality studies. For the planning and better performance of new interventions, we need more systematic research on theoretical and practical topics of implementation.

## References

1. Stock SR, Nicolakakis N, Vézina N, Vézina M, Gilbert L, Turcot A, et al. Are work organization interventions effective in preventing or reducing work-related musculoskeletal disorders? A systematic review of the literature. *Scand J Work Environ Health*. 2018;44(2):113-133. <https://doi.org/10.5271/sjweh.3696>
2. International Ergonomics Association (IEA). Definition and domains of ergonomics IEA; 2018 [cited January 2018]. Available from: <http://www.iea.cc>.
3. Westgaard RH, Winkel J. Occupational musculoskeletal and mental health: Significance of rationalization and opportunities to create sustainable production systems – A systematic review. *Appl Ergonomics*. 2011;42(2):261-96. <https://doi.org/10.1016/j.apergo.2010.07.002>
4. Framke E, Sørensen OH, Pedersen J, Rugulies R. Can illegitimate job tasks be reduced by a participatory organizational-level workplace intervention? Results of a cluster randomized controlled trial in Danish pre-schools. *Scand J Work Environ Health*. 2018;44(2):219-223. <https://doi.org/10.5271/sjweh.3683>
5. van der Beek AJ, Dennerlein JT, Huysmans MA, Mathiassen SE, Burdorf A, van Mechelen W, et al. A research framework for the development and implementation of interventions preventing work-related musculoskeletal disorders. *Scand J Work Environ Health*. 2017(6):526-39. <https://doi.org/10.5271/sjweh.3671>

Esa-Pekka Takala  
Finnish Institute of Occupational Health  
Helsinki, Finland  
[email: Esa-Pekka.Takala@ttl.fi]