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Workplace intervention and musculoskeletal disorders: the need to develop research on implementation strategy

Y Roquelaure

Despite the considerable amount of knowledge on the physiopathology, epidemiology and risk model of musculoskeletal disorders (MSDs) accumulated the last 20 years, they remain a major cause of work-related diseases in many countries. Multidimensional ergonomic interventions, including a participatory approach and individual, technical and organisational measures, seem to be an appropriate strategy for reducing the physical demands and the symptoms of MSDs,^{1 2} but evidence of their efficacy is still limited.³ Nevertheless, the scientific understanding of the aetiology of MSDs and their work-relatedness is sufficient to implement effective preventive interventions,^{1 2 4} as demonstrated by the study of Jensen and Friche⁵ published in this issue (*see page 20*). The study provides interesting insights into the prevention of musculoskeletal (knee) disorders and the strategy to implement interventions in a specific trade—that is, floor and carpet fitters (floor layers)—in daily practice. The authors demonstrate that implementation of new working methods requires a long-term structured approach to both implementation and prevention strategies in MSDs. Their intervention consisted of providing new working tools to allow performance of tasks in an upright posture to reduce the time spent in a kneeling position,⁶ which they hypothesised would reduce knee disorders. The implementation strategy followed a complex process including scientific research, information for employees, employers and trade unions, training, and participatory ergonomics with direct involvement of workers to develop and implement new working methods for floor layers.^{5 6} The results showed a positive effect of training to introduce new working methods and

change workers' behaviour during floor laying. The effects were sustained without reducing productivity or noticeably increasing strains to other body parts. This intervention study, as common in tailored interventions, suffered from several methodological flaws (for example, outcome measure based on symptoms only, possible selection bias, and the difficulty of randomising the introduction of new working methods intended to reduce MSD symptoms in a company). In view of the lack of a randomised control group, only limited conclusions could be drawn regarding the reduction in severity of knee symptoms in short and intermediate term follow-up after the intervention.

The overall preventive strategy implemented in floor layers assumes a dose-effect relation between the mechanical workload of the knees and MSD symptoms. This specific occupation provides a favourable field for research on implementation strategy of preventive intervention in MSDs since one main risk factor—that is, the specific awkward posture—probably accounts for a high proportion of the attributable risk of knee disorders. In other contexts, for example shoulder disorders in meat processing workers or low back pain in nurses, preventive approaches based on new hand tools may be less effective. The development of evidence-based practice in occupational health requires more longitudinal controlled intervention studies to assess the relations between the interventions and any decrease in musculoskeletal symptoms.⁷ Results of high quality randomised controlled intervention trials to study the efficacy of new hand tools or controls, such as keyboards with an alternative design, to reduce musculoskeletal symptoms in the workplace have recently been published, but the results are contradictory.³ Very few high quality randomised controlled multidimensional

intervention trials are available, because their quasi-experimental design is not always feasible in the occupational setting. Often, only less rigorous interventions can be adapted to the specific socioeconomic and psychosocial contexts of a company, particularly if the implemented technical and/or organisational changes are to be sustained. Although methodological issues in current intervention studies limit the conclusions that can be drawn regarding their impact on the workload and the symptoms of MSD, they provide important information on the feasibility of interventions aimed at preventing MSDs in various settings.⁷

Despite its limitations, this study⁵ provides wide public health perspectives by showing how the use of a participatory ergonomics approach reduced barriers to the introduction of innovative working methods in construction workers. Designing effective interventions to alter physical work demands and MSD symptoms is necessary but insufficient to prevent MSDs, since results depend not only on the effectiveness of the ergonomic intervention itself, but also on the implementation strategy. The latter involves the planning and processing of the implementation of assumed effective measures in order to incorporate them into the job, the work organisation, and the industry sector.⁷ The implementation strategy used in floor layers could probably be adapted to other contexts and offers an interesting framework to stimulate research on intervention studies in MSDs. Preventing MSDs is a complicated challenge, and there is a need to develop research on intervention studies which improve our understanding of the efficacy of different prevention strategies and different implementation strategies that are usable in the workplace.

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