European Agency for Safety and Health at Work

Work-related musculoskeletal disorders: why are they still so prevalent?

Evidence from a literature review

European Risk Observatory

Executive Summary

European Agency for Safety and Health at Work

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Title of EU-OSHA project: Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)

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Executive Summary

The aim of this exploratory review is to examine the continuing high levels of musculoskeletal disorders (MSDs) in the working population and to examine the evidence in relation to prevention.

The review has been prepared as part of a larger project, 'Review of research, policy and practice on prevention of work-related MSDs'. The project's objectives are:

- to improve knowledge of new and emerging risks and trends in relation to factors that contribute to work-related MSDs and to identify the related challenges;
- to identify gaps in current strategies for tackling work-related MSDs at both policy and workplace levels;
- to investigate the effectiveness and quality of workplace interventions and risk assessment approaches; and
- to identify new approaches for more effective prevention of MSDs.

The reported rates of MSDs across the Member States of the EU (EU-28)[1] increased from 54.2 % in 2007 to 60.1 % in 2013 (according to the results of the EU Labour Force Survey carried out in those years). Data from the European Working Conditions Survey do not show a significant reduction in the incidence of musculoskeletal pain in the lower limbs or upper limbs or of back pain between 2010 and 2015. It appears that, although there are legislative requirements to ensure that workplace hazards that might cause MSDs are controlled, there is limited evidence that this is happening.

Methods

To examine the topic of prevention of MSDs, an exploratory literature review was undertaken. This involved initial searching to identify hypotheses before conducting focused searching of the literature to explore research findings to test these hypotheses. The research questions to be addressed in this exploratory review were as follows:

- Why is there a continuing high prevalence of work-related MSDs?
- What are the changes in the world of work that potentially contribute to the high prevalence?
- What is the impact of demographic change?
- What is the impact of individual risk factors?
- What are the gaps in current prevention and risk assessment approaches?
- Do they also consider psychosocial risks, gender differences and/or age?

Scoping searches were carried out and followed by focused searches for each of the hypotheses identified. Research papers were procured and data extracted from each of them.

Results

Hypotheses generated

Twelve hypotheses were identified within the body of research including:

- The impact of digitalisation and information and communications technology (ICT)-enabled technologies may expose individuals to increased MSD risks.
- New forms of employment, including the gig and platform economies, have the potential to reduce workers' level of occupational safety and health (OSH) protection.

[1] At the time of the publication of this literature review, the United Kingdom is no longer a Member State of the European Union. Nevertheless it was still part of the European Union when the research was carried out in 2019, henceforth in this report the United Kingdom is referred to as a EU Member State.

- Previously high prevalence in one sector may move to a different sector. For example, shorter stays in hospital increase home recovery time, and patient handling then moves from the healthcare to the home care setting, thus shifting the exposure.
- The effect of changing workplace policies such as no-lift policies shifts the exposure site from the back to the shoulders, or just-in-time manufacturing increases the speed of working and level of repetition without ergonomic assessment, leading to an increase in reported MSDs.
- Unhealthy lifestyles, physical inactivity and rising obesity rates may result in increased musculoskeletal problems.
- The impact of changing workforce demographics mean an older workforce with an increased likelihood of musculoskeletal problems (whether arising from work or age) as well as a younger workforce coming to work with pre-existing musculoskeletal problems.
- The importance of psychosocial risks is increasing.
- A growing proportion of sedentary jobs results in increased occupational sedentary exposure and musculoskeletal complaints.
- Failure to reduce physical workplace hazards, including heavy physical work, excessive repetition, awkward postures and heavy lifting, results in continued exposure.
- Different socio-economic contexts, classifications of industrial diseases, support structures and insurance arrangements in each EU Member State have an impact on MSD reporting.
- A lack of adequate work organisation and/or work design results in increased exposures to MSD risks.
- There are gaps in risk assessment and prevention practices.

- **Work**

There are known associations between work factors, including poor and awkward postures, high levels of repetition and the need for high levels of force, with the prevalence of MSDs. However, there appears to have been little change in exposure to MSD hazards since 2005. The continuing high prevalence cannot be explained by physical work factors alone and other issues need to be considered.

- **Sectoral change**

In the last two decades, the EU has undergone a shift in its economy in which workers have moved from manufacturing industries to service and construction industries. This has resulted in a change in the nature of the MSD hazards to which workers are exposed, including patient handling in health and social care, poor posture, high levels of repetition in service work, and sedentary work in office environments. Postural risk scores are high in many remaining sectors.

- **Changing ways of working**

Work is changing in both how and where we carry it out. Digitalisation has resulted in the use of new technologies potentially allowing access to work at all times. Simultaneously, online platform working has increased whereby the relationship between employer and worker is changing and more people are either self-employed or on casual contracts in which the necessary OSH regulations might not be in followed.

This increase in digitalisation has also changed consumer behaviour and e-retail is consistently increasing. Consequently, more people are employed in this sector in picking warehouses and as delivery drivers. Although automation is being used by some organisations, there is still a need for humans for quality assurance, more complex picking tasks and at times more menial tasks. These workers can be subject to both high physical and mental demands when working under time pressure. There is little evidence at the moment that OSH hazards are being addressed.

New ways of working also include changes in work processes such as lean manufacturing processes in the manufacturing sector. Although the research is ambivalent about the impacts of lean processes on MSD hazards, it is clear that implementing change using job design and ergonomics can reduce exposure. Within healthcare using sliding rather than lifting and recuperation at home has changed the nature of the exposure. Although the home environment is good for the patient, it is less controlled and less likely to have lifting aids for the carer.

While fixed robots have been in the workplace for a few decades, the extent of automation and autonomous robots is predicted to increase in the coming years. What is clear is that, while automation can reduce exposure to MSD hazards, this is not always properly evaluated and workers may end up working in machine-paced roles. More positively, autonomous robots may reduce workers' exposure to dirty and highly repetitive work. There has been limited applied research examining how humans and robots will work side by side and the OSH issues that might be encountered.

Finally, more of us are spending our working lives sitting down. This has recognised adverse health effects, but sedentary work is also associated with MSDs, again with a number of identifiable risk factors. Job design needs to be considered to ensure that people can get up and move at work (and are encouraged to do so). In addition, ensuring that changing facilities and showers are available for people who want to take exercise during breaks can also be beneficial. Guidance for protecting sedentary workers' safety and health has been provided.

- **Health behaviours**

Although this exploratory review is focused on work-relevant factors in relation to the prevalence of MSDs, there are recognised associations between health behaviours and MSDs, in particular obesity, physical inactivity and tobacco smoking. Workplace health promotion could have a beneficial impact by reducing these behaviours and thus reducing the prevalence of MSDs.

- **Age and gender**

In relation to age, the prevalence of MSDs increases in older workers. Whether this is due to extended duration of exposure and/or reduced capacity with increasing age is still being debated. On examining exposure to MSD risks in older workers (usually defined as workers over 50 years) compared with those under 35 years old, it was found that exposure to repetitive arm movements and moving and handling loads was reduced, whereas exposure to painful and tiring positions was increased. These data suggest that older workers are still being exposed to considerable risks at work. As a corollary, there is also evidence to indicate that, when injuries occur, recovery time is longer.

The data also highlighted that younger workers were also reporting high levels of MSDs. Further research is required to establish whether this is due to starting work with problems or quickly developing MSDs after starting work. It is essential that prevention measures are made available throughout people's working lives.

Generally, men report more MSDs than women. However, the nature of their MSDs differs, with men more likely to report back problems and women neck, shoulder, hand or arm problems. When exposures to MSD hazards are examined, for specific hazards including repetitive movements and sitting for long periods, women and men report being exposed to the same extent. For lifting people, 6 % of women report carrying this out all the time (versus 2 % of men) and 9 % of women reporting lifting people for a quarter to three quarters of the time (vs 4 % of men). This implies that horizontal segregation has an impact, with more women in health and social care work. However, vertical segregation also plays a part, with more women in part-time roles that may expose them to MSD hazards. However, the impact of the dual role of women as workers with domestic responsibilities should not be ignored, as such work can both cause and prevent MSD risks. When examining age and gender, although women over 50 years old report more symptoms than men, this is the age group that has seen the largest increase in employment in the last decade.

- **Health beliefs and somatisation**

Health beliefs influence how we think about ill health, and somatisation is the manifestation of physical symptoms arising from psychological distress. Self-perceived poor health has been associated with an increase in the prevalence of MSDs. Individuals can bring positive or negative health beliefs to work, but negative beliefs can be associated with symptoms. In the work reported, negative beliefs on work-related health issues, prognosis and having heard of RSIs (repetitive strain injuries) was associated with symptoms. There appears to be a lack of knowledge of the symptoms of, prognosis for and likely recovery from MSDs, and increasing the amount and accurate of our knowledge may help in both prevention and recovery.

- **Psychosocial factors**

There is growing acknowledgement that psychosocial factors also have an impact on the prevalence of MSDs. Various pathways have been hypothesised, including high mental workload increasing muscle tension, exposure to stress not allowing recovery and stress causing changes in the immune or inflammatory system. The review identified that reducing exposure to burnout may have the potential to reduce musculoskeletal pain. Fatigue might also be a factor, and individuals with MSDs reporting getting less sleep. Psychosocial factors including poor social support, low levels of job control and work-life conflict have all been found to be associated with MSDs. Managing psychosocial risks may reduce musculoskeletal problems. There is a concern that this is not happening widely, partly because many employers are unaware of this connection and partly because psychosocial risks are not categorised as a specific risk (being bundled into the Framework Directive with no differentiation between them and other workplace hazards). Where psychosocial risks are assessed, this is often done 'in a silo', i.e. focusing purely on the consequences of 'stress' for mental health, an approach that makes no linkage between psychosocial and other workplace risks.

- **Socio-economic differences**

Socio-economic differences between Member States and national differences in methods of reporting MSDs do have an impact on their prevalence. At present, this is perceived as being affected by changes in the reporting of industrial diseases and by awareness campaigns about such changes increasing reporting. However, the review also showed that the reporting of back pain has increased in countries where there are higher levels of social protection and social inclusion. It was suggested that this was due to income protection and support mechanisms being more readily available.

- **Gaps in risk assessment and prevention practices**

Although provisions for the prevention of MSDs are laid down in the Manual Handling and Display Screen Equipment Directives, these do not cover all MSD risks. There are a large number of tools available for risk assessment, but few have been thoroughly evaluated. Why do we still have a large number of people reporting MSDs? Our focus on aetiology rather than epidemiology may be holding the research back, as we need to develop and report intervention studies. We do not know how many organisations are implementing workplace changes or how effective these are. Thus, planning, designing and implementing intervention research over a reasonable timescale has to be the way forward. The review also identified barriers and facilitators to implementing strategies for MSD prevention. Recently, evaluating the impact of OSH legislation and enforcement revealed that there is a large gap in both musculoskeletal and psychological research. There is a clear need to evaluate both musculoskeletal and psychosocial risks in a joined-up way, and research from Australia shows how this could be achieved.

A number of guidance documents are available in which prevention of MSDs must be seen as a long-term commitment as part of general OSH management and must involve the participation of the workforce. Lack of knowledge can be a barrier to prevention, so training and awareness raising is also essential. The need to think about psychosocial risks as part of prevention has also been emphasised. We need a broader framework involving the regulator, organisations (employers and workers) and researchers.

In relation to our new ways of working, further guidance has been provided on sedentary work to increase opportunities for moving while at work. There remains a large area of research on automation and robotics that we need to consider in relation to the interface between the human and the machine.

Discussion and conclusions

This exploratory review has examined various hypotheses on why there is still a high prevalence of MSDs. The review investigated changes in the sectors where people are employed and changes in the way people work as a result of technological and process changes. What is clear is that exposure to MSD hazards is not reducing. Although there is the potential to reduce exposure, there is little evidence that this happening in workplaces and exposure may actually be reduced by the casualisation of work.

There is certainly a requirement for a better understanding of the interface between the human, the workplace and work equipment in new technologies.

There is still a need for workplace health promotion to improve the level of health we bring to work. Our understanding of health beliefs might give us an opportunity to share accurate knowledge about MSDs and their occurrence, prognosis and prevention to help us understand the issues. Demographic change and an increasingly older workforce creates a group of workers more at risk; surprisingly, younger workers also appear to be starting work with MSDs.

The recognition of psychosocial factors and their influence on the prevalence of MSDs has not been linked into the risk assessment process in any real way. Research from Australia does make recommendations on how this can be done, but this has not been yet evaluated.

There is a clear need to take new approaches to preventing MSDs, including designing workplace intervention studies that take a more holistic approach covering both physical and psychosocial risks. Furthermore, educating the public about MSDs is essential to increase awareness and knowledge of their impact and help bring about change.

This exploratory review has identified a clear need to do the following:

- Understand differences between countries and, where countries have reduced the prevalence of MSDs, find out what works and why.
- Adapt risk assessment tools and risk reduction measures to be able to assess both MSDs and psychosocial risks in one assessment.
- Increase awareness and understanding of the work relevance of MSDs and their identification, prognosis and prevention in the workforce.
- Carry out intervention studies to help identify what is effective and just as importantly what does not work.
- Ensure that workplace health promotion activities focus on MSD prevention as well as health behaviours that affect MSDs.
- Identify current practices to improve the prevention of the impact on MSD caused by the digital integration of an individual's work-life commitments and platform working.
- Update legislation to cover new technologies, including examining the implementation of the existing legislation to determine:
    - Does the legislation cover the correct risks?
    - Are employers adequately assessing these risks?
    - Are employers implementing appropriate controls?

The European Agency for Safety and Health at Work (EU-OSHA) contributes to making Europe a safer, healthier and more productive place to work. The Agency researches, develops, and distributes reliable, balanced, and impartial safety and health information and organises pan-European awareness raising campaigns. Set up by the European Union in 1994 and based in Bilbao, Spain, the Agency brings together representatives from the European Commission, Member State governments, employers' and workers' organisations, as well as leading experts in each of the EU Member States and beyond.

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