Improved risk management of musculoskeletal disorders: The need for a new approach

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Dr Jodie Oakman:

Hello and welcome. I’m Dr Jodie Oakman, I head the Centre for Ergonomics and Human Factors at La Trobe University. We are a WHO collaborating centre. Our research program in the Centre for Ergonomics and Human Factors has a large focus on the risk management of musculoskeletal disorders. Today, I'm going to talk to you about improved risk management of musculoskeletal disorders, the need for a new approach.

I’m going to pose and then address three key questions today. What does the research evidence tell us about the causal factors of MSDs? Are there gaps in current strategies used to manage MSDs? And then, finally, what are we doing at La Trobe University to contribute to the knowledge of management of MSDs?

Just some background, we are getting older, that’s a fact. The population is aging and people will need to work until we are in our 60s and, it has been postulated, until we're 70. So this poses a couple of issues, the first being that we need to encourage people to want to work for longer and this requires quite a shift, but that’s not the focus of my presentation today. The second thing is ensuring that people are able to work for longer and that ensures that they're not exposed to excessive physical or psycho-social hazards over their life course so that they can make choices about their employment up until the time for retirement.

The way we work has undergone transformational change in the past 15 to 20 years. We're now on call, responding to things in our leisure time, sometimes because we have to, and sometimes because we've loosened the boundaries between home and work.

The impacts of this on health outcomes hasn't been fully explored, but is part of the whole overall picture of management of occupational health issues such as MSDs.

Now, what are MSDs? The issue of development of MSDs is a pivotal part of the discussion and in many ways we try and fit compensation schemes to an injury, rather than the other way around. Mostly, in musculoskeletal disorders, we’re not talking about injuries at a particular point in time event, we’re talking about development of a disorder due to exposure over a long period of time to occupational hazards. The issue, and complexity, is the number of hazards and how they interact and this makes MSD risk management particularly complex. There are a number of definitions of MSDs, but there is consensus on versions of the following: that work-related musculoskeletal disorders affect tendons, tendon sheaths, muscles, nerves, bursae, blood vessels in the body. So how do we know whether it's an injury or a disorder?

In many cases the clinical diagnoses of MSDs is inaccurate, the reliability often poor and we know that in recent times there's been a bit of publicity around the relationship between MRI scans, X-rays and the symptoms that people demonstrate.

One of the issues in occupational health is that we often spend a lot of time to the right of the arrow, rather than down the left, focusing on the onset of symptoms and trying to target our risk management strategies at that end of the arrow. I'd suggest that prevention activities need to really start well before we see people move into the compensation, or claim cycle, which we know some people have a lot of trouble getting out of.

Perhaps our over-reliance on clinical diagnoses can cause us to consider events attributed to the injury in a way that may not be particularly helpful. And particularly when we use these diagnoses to develop our prevention or control activities, this may lead us down a garden path. Mostly, MSDs are accumulative in nature, that is they are the result of exposure to a range of hazards over time and it's very difficult to
attribute one single event, and in fact evidence would suggest that this is in fact correct and that what we’re seeing in the straw that breaks the camel’s back.

This model here, this 2001 model, developed by the National Research Council and The Institute of Medicine is quite a well-known and well-described model in the literature. It was developed after an extensive review by a panel of experts who reviewed epidemiological evidence around causal factors of musculoskeletal disorders. And we can see here in this model that the influence of both bio-mechanical hazards, of which we are mostly very familiar with and they’re well accepted and well entrenched in our risk management plans for reduction of musculoskeletal disorders. Down the bottom, we can see organisational factors and social context which I’ve grouped there as psycho-social hazards which is the commonly used term here. These factors can either independently, or both, influence the person effects through bio-mechanical loading into loads and physiological responses. This in turn influences internal tolerances and how the body responds to these particular hazards, resulting in a range of outcomes, pain, discomfort, leading on to impairment and disability. And of course, on the right are the individual factors age, gender, different capacities, these are largely outside the sphere of influence of workplaces and so our prevention activities really need to focus on the workplace factors.

This tells the same story as the last one, but highlights separate but interacting causal mechanisms. We can see here that the psycho-social hazards and the bio-mechanical hazards can both influence the cumulative tissue damage resulting in presentation of injury.

This model in 2014 takes into account both of these models and we use this conceptual framework to underpin our research here at La Trobe, which is heavily focused on risk management of workplace MSDs. So we can see here that what we’re seeing is this match between, or poor match, between individual factors, those work-related abilities and skills, personality, genetic vulnerabilities and the workplace factors so those psycho-social factors, organisational factors and physical loads. When these are not well-matched, so we have a demand capacity imbalance, we see that we get effects within the person so either biomechanical loads - we get a stress response, fatigue, reduced internal tolerance resulting in tissue damage and/or pain.

Workplace hazard categories can be broadly grouped as manual handling hazards, which are focused on the task, or psycho-social hazards and there are two groups of these. One is the organisational factors which are around the organisation of work and job design. And then there’s the social context - the support, the communications, the relationships with managers. There’s some examples of organisational and social context hazards, organisational hazards can be around working hours, workloads, how jobs are designed, levels of control for individuals, pace of work, conflicting work demands. Social context is around communications with management, value of individuals, health and safety culture, relationships with colleagues and supervisors. Many organisational hazards are actually the responsibility of managers and supervisors, they arise from how work is organised and job designed. There is an overlap between these two groups. Managers and supervisors play a key role in creating these hazards but also in developing effective controls.

MSD risk is determined by many hazards, organisational and psycho-social and these interact or are additive, but we're still faced with a big question by many people, "Aren’t manual handling hazards the main problem?" That is, "Isn’t it the physical aspects of work that are primarily responsible for the development of musculoskeletal disorders?" In the literature, of which there is a large substantial body of evidence to support the role of both physical and psycho-social factors, this particular paper by Johnson et al was focused on retail material handlers, so very physically orientated job, large population -6,311, good study design and what they found was that what these odds ratio is predictors of new back pain. We can see there that job intensity had a predictive ratio of 1.8 compared to the lifting, the physical aspects of the work, 20 pounds at work.

So, in summary, the psycho-social factors were at least, or even more so, influential on the development of new pack pain.
In this review, a systematic review of a large number of papers, about 50, which undertook rigorous statistical analysis to examine the impact of psycho-social factors on MSD development. What they found was, again, looking at these odds ratios, or predictors of the likelihood of developing low back pain was that high job demands had a higher likelihood than low job satisfaction, or supervisor support, or low social support, although they are fairly close. But the key message here is that these factors were important in determining new cases of low back pain. I don't think it's helpful to focus particularly on the numbers, but just both factors are important, both psycho-social and physical factors are important.

In Australia, more specifically at La Trobe University, we've had a long-standing research program on musculoskeletal disorders, beginning in 2003 was the first piece of work, but here we can see in 2006 we started with a review, up until 2015 where we’re currently working on a project looking at workplace barriers to reduce the incidents of musculoskeletal and mental health disorders. In addition to that, we’re currently working on an intervention project in the aged care sector to look at new ways to reduce risks associated with MSDs.

More locally in our work, we found that taking together a number of studies in healthcare, manufacturing, logistics, when we start looking at those odds ratios, or predictive contributions, is a good way to describe these, contributions to increasing MSD risk, we see that physical and psycho-social hazards contribute very similarly to increased MSD risk and low job satisfaction equally makes a contribution to the increased likelihood of developing a musculoskeletal disorder.

So, in terms of MSD risk management it’s clear assessment and management of psycho-social hazards is essential. It's not optional. There is sufficient evidence and sufficient good quality evidence to support the role of both physical and psycho-social factors. In addition, the severity of exposure to any single hazard isn't necessarily a good indicator of overall MSD risk and the output of tools for assessing adverse postures and bio-mechanical loads indicates severity or riskiness of the particular hazards. It doesn't necessarily indicate overall MSD risk, because they often take a very narrow focus rather than looking at the job as a whole.

There are a number of barriers to improving current workplace practices for reducing MSD risk, or prevention of MSDs. We still have an ongoing widespread erroneous belief that MSD risk is largely due to physical hazard exposures. Many of the guidance materials that we use still focus on the physical aspects of work, including the sorts of tools that we use to identify and control hazards and risks associated with MSDs. The conventional OHS risk management paradigm that we use doesn't necessarily help us to develop and promote effective risk management for MSDs. It tends to be separate, operate quite separately to other business management strategies and procedures and it would be beneficial to see these better integrated.

One of the issues is this focus on hazard by hazard, rather than looking more holistically at all the factors, so rather than taking into account the job as a whole, and you'll see there an example of perhaps a moderate force for pushing a trolley might be a problem if it’s done a lot and there is a lot of time pressure associated with the job. But if it's done only occasionally and without time pressure it may not be a problem, so we need to be much better at looking at the contextual factors around particular tasks that individuals are undertaking.

In addition, our conventional aim in terms of eliminating, or reducing hazards isn't always appropriate. Sometimes physical hazards shouldn't be always eliminated, workloads should not always be minimised. We know that people having interesting challenging work is actually good for them and that work without challenge is actually hazardous in itself.

So we need expansion of our standard risk management paradigm and there's a parallel here with the approach needed to reduce the risk of major accidents. I take a quote here from James Reason who argued that “Errors are like mosquitoes, you can swat them one by one, but they still keep coming.” This is analogous to MSD hazards and they are a bit like human error that you can swat them one by one, but it’s
not the most effective way to reduce risk. We need MSD risk management tools and associated guidance that covers both physical and psycho-social hazards and it encourages a high level of worker participation. We know and encourage worker consultation, but we need to encourage participation in terms of risk management for MSDs. It needs to include appropriate assessment methods and advice on how to develop appropriate controls for both physical and psycho-social hazards.

At La Trobe University, we have been developing an MSD’s risk management tool-kit over the past number of years. We are currently implementing this tool-kit in the aged care sector and testing various aspects of the implementation process.

It very much the tool-kit follows a standard risk management process with some key differences to address these identified gaps in current practices. It’s highly participative, involving the gathering of a risk management team and collation of available data on MSDs. It involves education of management and supervisors in what are all the relevant associated factors with increased MSD risk, physical and psycho-social. A key plank of this risk management tool-kit is the use of staff survey results which measure both hazards in the psycho-social work space and the physical work space. These are helped to develop a hazard and risk profile. These are then used to develop risk controls with the risk management team. Of course then there’s an implementation phase and a review and evaluation phase consistent with a risk management cycle.

The tool-kit has been developed under the guise of the WHO framework for all tool-kits which is based on the WHO Healthy Workplace model. The tool-kit is currently being tested in the aged care sector, as I said before, and we’re working to customise the tool-kit to their existing OHS management systems. It will be interactive, allowing users to customise as they need and into their own workplace data. Future work from our end will involve implementation and evaluation and comparison of data across different sectors.

So we come back to the three questions that I posed at the beginning of the presentation. What does the research evidence tell us about the causal factors today? I hope that from the presentation today you can see that there is very strong evidence to support the role of physical and psycho-social factors in the development of MSDs, that identification of both physical and psycho-social factors is not optional but mandatory if we are to effectively develop risk controls for MSDs. Are there gaps in current strategies used to manage MSDs? I hope, again, that you see from the presentation today that there are, that we currently still focus on the physical aspects of work predominantly in the management of MSDs and I would suggest that this is in part why we find it perhaps difficult at times to significantly reduce the large numbers of MSDs. Thirdly, what are we doing at La Trobe University to contribute to knowledge of management of MSDs? Well, we've been working over the last 10 to 15 years to help further that evidence base and then really working on translation, taking that research out into practice to develop more effective materials and supports to help organisations manage their MSDs more effectively.

So, I thank you today for listening to this presentation and if you're interested in further discussion, there are my details. We will be seeking partners in the coming year to work further on implementing the tool-kit in a range of different organisations and we'd welcome discussions about potential partnerships. And, if you're interested in learning more, we have a short course coming up called Health and Design of Work and we also offer a graduate certificate of Masters, or Masters in Ergonomics, Safety and Health at La Trobe University. Thank you very much.

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