CRE-MSD Centre of Research Expertise for the Prevention of Musculoskeletal Disorders

Improving Workplace Manual Handling Training Programs

Tyson Beach & Tilak Dutta

Manual handling negatively impacts the musculoskeletal health of many workers. If manual handling cannot be eliminated, workers should receive training to control the associated health hazards and risks. This is especially important for firefighters, paramedics and healthcare workers who cannot avoid handling people, equipment or tools, often in unforgiving circumstances.

Key Messages

- Meta-analyses consistently report that manual handling training is ineffective, but they do not consider training quality
- High-quality manual handling training combines theory and best evidence from kinesiology and implementation science to develop worker health, physical fitness and capacity; this helps control hazards, reduce risks and improve performance
- When manual handling training programs are high-quality, there is support for their use, especially when manual handling is physically demanding and unavoidable

Evidence-informed occupational health and safety researchers and practitioners may question the value of manual handling training given that meta-analyses consistently reveal the ineffectiveness of these training programs.[1] A limitation of these meta-analyses is that they fail to consider the quality of the training program content or its method of delivery. Instead, they focus almost exclusively on the quality of study design, which leads to devaluation or exclusion of a large proportion of training-related research. These biases not only challenge conclusions drawn in meta-analyses about training effectiveness, but they also limit what can be learned about the reasons why training programs are effective or ineffective.

The quality of manual handling training in 77 studies incorporated in meta-analyses was recently appraised.[1,2] Many training details were not reported in the appraised studies, but from what could be deciphered, training programs were often based on unsupported assumptions that: there are universally "safe" or "correct" handling techniques; these techniques can be taught using traditional classroom-style methods and without tailoring content to accommodate needs and preferences of individual workers and workplaces; and workers can learn and directly apply these techniques on-the-job with limited opportunities to practice in realistic settings. Also, training seldom focused on developing capabilities and motivations of workers to self-monitor and self-regulate the stresses imposed on them by adapting their tasks and environments wherever possible. When training content and delivery addressed the limitations and assumptions above, it was found that training has more potential than what the results of the meta-analyses generally suggested.[1,2]

There is also support for the notion that engaging in physical exercise can help prevent and manage the ill-effects of manual handling on worker health and performance.[3,4,5] Based on the available evidence, the specific exercise types, frequencies, intensities and times required are unknown, as are the underlying mechanisms. However, when exercise leads to movement competency and physical capacity improvements,[c.f. 6,7] theory supports its inclusion in manual handling training programs. Specifically, exercise not only elicits known structural (e.g. tissue quality and quantity) and functional (e.g. strength, power, endurance, flexibility) adaptations that can by themselves increase performance potential and control health hazards and risks, but it can also be used effectively to develop the knowledge, understanding, competence, confidence and motivation to appropriately apply kinesiology principles[8] to control hazards and risks (i.e. exercise can improve "physical literacy"[9]). Thus, exercise can make workers more fit for their work, *and* it can help them better fit their work to their capabilities.[10]

Recommendations

A participatory approach to manual handling training is recommended.[11] To do this, four interdependent phases can be used: (1) assessment; (2) design; (3) implementation; and (4) evaluation. Resources are available for using this type of approach.[12]

Assessment focuses on gathering essential information and support. Stakeholders and content experts (e.g. professional kinesiologists, ergonomists) collaborate to develop a shared understanding of priorities, responsibilities, resources available and expected outcomes by analyzing barriers and facilitators to designing, implementing and evaluating a tailored training

initiative. It is critical to manage expectations, as commitment to ongoing and progressive training is likely required to affect the biological, psychological, social and cultural processes that lead to desired outcomes.

Design involves crafting a training plan – comprised of general and specific components – based on the assessment. General training is designed to promote and support health-enhancing behaviours (e.g. adequate sleep, nutrition, stress management, non-occupational physical activity, etc.), with primary emphasis on using progressive exercise to build and maintain physical literacy and capacity. This general training provides the "raw ingredients" needed to fully benefit from specific training. Specific training is designed to train workers to first identify and assess their health hazards and risks before training them to (re)organize their work and/or bodily movements to effectively regulate the underpinning biopsychosocial stressors. To do this well, it is vital to co-create and co-evolve training with input from stakeholders, especially experienced workers.

Implications for the prevention of MSD

Manual handling training programs should:

- be designed, delivered and progressed to meet needs and wants of stakeholders
- promote and support health-, fitness- and performance-enhancing behaviours (esp. physical exercise)
- offer realistic and sufficient amounts of practice to develop and preserve the skills and competencies of workers to:
  - identify and interpret hazards and risks in diverse work situations; and
  - adapt work (ergonomics) and bodily movements (kinesiology) to control health hazards and risks and improve performance on-the-job

Implementation involves putting the plan into action. Stakeholder-specific messaging is needed to get support necessary to change attitudes, beliefs and health behaviours. A unifying core message that can help gain buy-in from stakeholders is that exercise delivered based on principles and practices of kinesiology is not only a powerful tool for cultivating overall worker health and wellbeing, but it also develops the capacity to meet demands of work, life and play. Support from organizational leadership is required to improve workers' capabilities, opportunities and motivations to exercise; this typically consists of providing: time; space; equipment; and access to health professionals who can help manage work and life stressors. The specific training employs experiential learning (vs. conventional teaching) methods to train workers to safely and effectively meet job demands by: using (in)formal hazard identification and risk assessment tools to "read" their work situations; and modifying hazardous or high-risk situations using a combination of ergonomic and personal movement strategies. It is vital to provide practice activities and environments that represent realistic working conditions, and for workers to experiment with and reflect on a variety of movement strategies to develop situational and body awareness required to regulate work-related stressors.

Evaluation refers to ongoing monitoring and critical review of training processes and outcomes. Process evaluation focuses on judging the quality of training and its delivery, and consists of indicators that training: reaches and engages the intended workers; is of sufficient quantity to build and maintain necessary skills and competencies; and leads to expected changes in work practices. Outcome evaluation focuses on the ultimate goal(s) of training, generally evidenced by reduced number, severity and impact of musculoskeletal disorders without adversely influencing worker and/or organizational performance benchmarks. Prior to designing and implementing training, it is vital for stakeholders to agree on evaluation indicators, how and when they will be assessed, and by whom.

Conclusion

Manual handlers should receive high-quality training to prevent and manage the associated musculoskeletal health risks. Poorly designed training can fail to develop and maintain necessary competencies and skills of these workers to: identify and interpret their health hazards and risks; and adapt their work situations and bodily movements accordingly. High-quality training addresses these shortcomings, and thus not only has potential to control worker health hazards and risks, but also to improve worker performance. Detailed guidelines for developing, delivering and evaluating high-quality manual handling training are provided elsewhere,[1,11] as are recommendations for developing and maintaining the physical capabilities to benefit most from the training.[3]

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