Worksite health promotion in the construction industry

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Summary

In the construction industry, the workforce is ageing and despite technological innovations workers are still facing high physical work demands. Especially in combination with unfavourable health and lifestyle indicators this provides challenges for maintaining a sustainable and productive workforce, which emphasises the need for interventions in the construction industry. **Chapter 1** provides an introduction to the background and objectives of this thesis. The main goal of this thesis was to systematically develop a tailored intervention to prevent and reduce overweight and musculoskeletal disorders in blue collar construction workers. This intervention programme (VIP in Construction) was evaluated in a randomised controlled trial.

In order to gain more insight into the potential of body weight management as a strategy for reducing musculoskeletal disorders, the relation between body weight and musculoskeletal symptoms was studied **(chapter 2)**. Based on analyses in a large working population sample, body mass index (BMI) was found to be positively associated with musculoskeletal symptoms, in particular symptoms of the lower extremity. Additionally, compared to employees with normal weight, obese employees were at increased risk for developing musculoskeletal symptoms and suffered impaired recovery. Surprisingly, the association was stronger for employees with a low physical workload compared to those with a high physical workload.

The systematic development of the VIP in Construction intervention, as well as the design of the randomised controlled trial, is thoroughly described in **chapter 3**. The Intervention Mapping protocol was applied to systematically develop the intervention. By doing so, the intervention matched the needs and preferences of the target population and was based on the current evidence for the effectiveness of lifestyle interventions. The intervention programme consisted of individual face-to-face and telephone counselling, both employing information and materials aimed to improve lifestyle behaviour. The intervention was tailored to each participant's motivational readiness for change, varying in focus, number, and duration of counselling sessions. To further increase compliance, the intervention was linked to the company's periodic medical examinations and took place at the worksite and during working hours.

A process evaluation was conducted to better explain the study's findings, and to give insight in the implementation of the intervention. The process evaluation of the intervention (**chapter 4**) was conducted following the RE-AIM framework for the evaluation of the public health impact of health promotion interventions. Both qualitative and quantitative methods were applied to evaluate process measures. The external validity of the trial was satisfactory, based on representative reach of workers and adoption of workplace units in the participating construction company. Intervention participants showed significantly more progression through the different stages of

behaviour change than did controls. The extent to which the intervention was implemented was, however, modest. The satisfaction of participants was, in contrast, high and 84% of the participants received at least one counselling session. Still, adjustments to the intervention should be made to improve exposure and fidelity to the protocol. Based on the RE-AIM dimensions, it was concluded that the intervention is feasible and based on improvements on determinants of behaviour change potentially effective in blue-collar construction workers.

Chapter 5 and 6 present the effect evaluation of the worksite health promotion intervention. A total of 314 participants were randomised to the intervention (n=162) or control group (n=152). Data were collected at baseline, at 6 months directly following the intervention, and at 12 months. After 12 months the loss to follow-up was 17%. The effectiveness of the intervention compared to usual care was assessed using regression analyses with the outcome measures at 6 months and 12 months follow-up as the dependent variables and adjusting for the baseline levels of the outcome measure. Effectiveness of the intervention on body weight, BMI, waist circumference, physical activity, dietary intake, blood pressure, and blood cholesterol is presented in **chapter 5**. Initially, at 6-month follow-up, intervention participants significantly showed positive changes in physical activity and dietary behaviours (decrease in intake of sugar-sweetened beverages) compared to controls, as well as positive effects in body weight and related outcomes (body weight, BMI and waist circumference). Long-term effects on body weight and related outcomes were still promising, but no longer statistically significant. **Chapter 6** describes the evaluation on musculoskeletal symptoms, physical functioning, work-related vitality, work performance, work ability, and sickness absence. Neither at 6-month follow-up nor at 12-month follow-up statistically significant intervention effects on these outcomes were found.

Chapter 7 describes a cost-effectiveness and financial return evaluation of the intervention compared to usual care. The evaluation was conducted alongside the RCT with a follow-up of 12 months and included both the societal and the employer's perspective. The intervention was found to be not cost-effective from the employer's perspective, in improving work-related vitality and job satisfaction. It was concluded that the cost-effectiveness of the intervention, of which the costs were €287 per worker, depends on the "willingness to pay" of decision makers for their effects. Financial return estimates were positive for the employer, but these estimates showed a high level of statistical uncertainty.

In the final chapter (**chapter 8**) the main findings are discussed and interpreted, and recommendations for future research and practice are given. It was concluded that despite a systematic design and theory-based approach resulting in promising short-term results on intermediate and primary outcomes, overall the VIP in Construction intervention showed no additional beneficial (cost-)effectiveness or statistically significant financial return after the

first year of implementation. Therefore, the implementation of the intervention in its current form cannot be recommended. Based on the findings of this thesis, organisations attempting to improve worker health and work-related outcomes should provide a more multifaceted intervention including (psycho-social) work organisational and environmental aspects and should additionally focus on effective maintenance strategies.