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Worksite health promotion in the construction industry

Viester, L.

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Chapter 1

General Introduction

Developments in the construction sector

The labour market is changing dramatically. Between 1990 and 2011 the average age in the actively employed increased by 5 years, to over 41 years of age [1]. From 2013 on this will accelerate. According to the Statistics Netherlands (CBS) population's prognosis, the number of people aged > 65 are projected to rise from 2.7 million in 2012 to 4.7 million in 2041 [2]. The ratio of economically active individuals to pensioners will become unfavourable, and as a result retirement age will be raised. Hence, the workforce is ageing and this also applies to the construction sector, where currently more workers are in their 50s than in their 30s.

In the upcoming years, despite the counteracting consequences on employment as a result of the current economic recession, in several sectors a shortage in workers is expected. In the construction sector this shortage will also result from a decrease in the number of young workers entering the sector. An additional concern is that sickness absence is also more common in blue collar occupations [3]. The combination of ageing with high physical demands at work for this occupational group results in relatively high risk for increased sickness absence and work disability. Keeping ageing employees at work is a key goal of European labour policy, and from the perspective of employers it is essential to invest in the health of their employees.

Another consequence of an ageing workforce is the increase in health risks. Body weight increases with age, and older workers suffer increasingly from musculoskeletal complaints, especially in physically demanding professions [4,5]. These developments, especially in combination with unfavourable health and lifestyle indicators, provide challenges for maintaining a healthy and productive workforce, and emphasise the need of interventions in the construction sector.

Overweight, lifestyle and musculoskeletal disorders

Overweight becomes an ever greater public health problem. During the last decades the prevalence of obesity has increased worldwide, and the World Health Organization (WHO) lists overweight and obesity as one of the leading global risks for mortality [6]. Increased prevalence in overweight and obesity also applies to the Netherlands. In 2011, according to the Dutch Bureau of Statistics (CBS) over 50% of the male and 40% of the female population was overweight [7]. Of this population 10% of the men and 13% of the women were categorised as severely overweight, i.e. obese. Although the steep increase of the last three decades seems to be reaching a plateau, the obesity numbers are still rising.

Overweight and obesity are associated with a series of secondary complications and serious comorbid diseases, such as elevated rates of diabetes, cardiovascular disease, cancer and musculoskeletal disorders (MSD) [8-10]. Along with these detrimental effects on a person's health and well-being, there are substantial economic consequences to consider. The annual medical

costs of overweight in the Netherlands have been estimated at €500 million [11]. In addition to these direct health care costs, indirect costs of overweight for employers resulting from loss of productivity due to both sickness absenteeism and presentism, and work disability are even more substantial [12].

Among Dutch construction workers, the prevalence of overweight and obesity is even higher than in the general population. In this specific occupational group 64% of the workers is overweight, of which almost a quarter is obese [13]. Moreover, it seems that blue collar workers also have poorer scores when other lifestyle and health indicators are considered, including cardiovascular risk factors, leisure time physical activity and smoking [14-16].

Prevalence of overweight and obesity is lower among populations with healthier lifestyle behaviours [17]. A stable body weight requires a long-term balance between energy intake and energy expenditure. If energy intake exceeds expenditure, the excess of energy is stored as adipose tissue. The development of overweight and obesity is either the result of detrimental food intake behaviour, decreased physical activity behaviour, or a combination of both, with the consequence of an imbalance between energy uptake and expenditure. The effects of a positive energy balance can therefore be prevented and reversed by caloric restriction and increasing physical activity.

Although blue collar workers might be more than average physically active at work, this is not accompanied by better health or improved physical capacity [18,19]. Recent research indicates that contrasting health associations of physical activity at work and leisure time physical activity exist [20]. Physical activity at work does not induce positive changes in aerobic capacity or muscular strength in workers [21]. Furthermore, being physically active at work might be compensated by more sedentary/inactive behaviour in leisure time. Although more likely to meet the weekly recommendations of overall physical activity [22], individuals from lower socioeconomic backgrounds and blue collar workers are less likely to engage in sports and leisure time activities [22-26]. Aiming at increasing leisure time physical activity in construction workers might therefore be a relevant strategy to improve both energy balance and general health.

Another main cause of overweight is poor diet. Unhealthy eating is known to be more prevalent among individuals with lower socioeconomic status, with less fruit and vegetable consumption and higher consumption in refined products based on different household incomes, educational levels or occupational groups [27,28].

Apart from health problems most commonly related to overweight, such as diabetes or cardiovascular disease, overweight is also negatively associated with muscular strength [29,30] and increased risk for musculoskeletal pain [31,32]. Among blue collar workers in the construction sector, long-term sickness absence and work disability are primarily caused by MSD. When considering the high prevalence of MSD and overweight and the possible association between overweight/obesity and MSD, preventing and reducing excessive body weight among workers with a high physical work demand, might also be a strategy to decrease musculoskeletal

symptoms. Epidemiological studies have shown that some personal risk factors for MSD, such as high BMI, or lifestyle factors, such as smoking, are the same factors as those related to poor general health. Therefore, general health promotion might be an option to prevent MSD. In a systematic review of Proper et al. [33] it was concluded that there is strong evidence for positive effects of worksite physical activity programmes on physical activity and MSD. Since overweight and MSD are possibly associated, and (consequently) have joint risk factors, addressing these health related problems simultaneously should be considered.

In order to prevent and reduce overweight and its related health and economic consequences, this thesis describes the systematic development and evaluation of a lifestyle and health-enhancing programme tailored to workers in the construction industry.

Worksite health promotion

Although there is a variety of settings and contexts available to provide health promotion programmes, the WHO has described the workplace as one of the priority settings for health promotion into the 21st century [34].

Traditionally, worksite health promotion (WHP) has been concerned as a part of occupational safety and health, by influencing important health determinants at work, and as a strategy to reduce sickness absence. More recently, issues of productivity and sustainability, well-being and lifestyle choices have been addressed and WHP can be regarded even as a part of organisational development. The concept of WHP is becoming increasingly relevant as more employers recognise that (sustainably) realising organisational goals in the current competitive business environment, economic climate, with increasing pressure on the labour market, and in combination with an aging workforce, can only be achieved with a motivated and healthy workforce. WHP in the construction industry could contribute to a better balance between organisational targets on the one hand and employees' health needs on the other.

The worksite as setting for health promotion has several advantages. First, it provides the possibility to reach large groups, and the working population spends a large proportion of their waking hours at the workplace. These opportunities are of specific importance in construction workers who are often involved in shift work and spend a lot of time commuting to and from work. Second, there is the possibility to incorporate the programmes in existing organisational infrastructure and make use of existing communication and education channels. Third, the workplace provides the presence of a natural social network.

In addition to efforts of worksite health programmes to increase health and vitality of the workforce, the worksite as setting provides opportunities to address health inequalities in the workforce. While for the population as a whole, and for all social classes, life expectancy has improved, social health inequalities remain. Generally, blue collar construction workers consist

of a lower socioeconomic group than white collar workers. Physical working conditions explain part of the social gradient in health [35,36]. To improve health among lower socioeconomic status workers, workplace health promotion programmes need to focus on workers in blue collar occupations, especially since this group is harder to reach in general public health efforts. There is evidence that workplace programmes are both clinically effective and cost-effective in industries employing blue collar workers [37].

Thus, worksites are regarded as a promising context for health promotion while they provide many opportunities to reinforce health behaviours, especially in groups that are hard to reach outside this setting.

Context and project setting

The project is part of a larger research programme 'Vitality in Practice' aiming at enhancing vitality of companies and their employees by developing and evaluating tailored worksite health promotion programmes. The study described in this thesis was developed and evaluated among blue collar construction workers employed by a large construction company. Investing in health and vitality of their workers is essential for the company to realise its ambitious goals, along with an aging and shrinking workforce.

As other employers in the construction industry, the company was already engaged in WHP activities for their employees. WHP consists of various components and activities, such as for example periodic health screenings (PHS), company fitness programmes, and courses in smoking cessation. However, the health benefits, and effects on work-related outcomes, such as sickness absence and work ability, of these activities have not been identified. Moreover, it is not established whether these efforts reach the target population. Participation in these activities is on voluntary basis. As a result it is not clear if those most at risk are being reached. Based on studies on participation in health promotion programmes, it is hypothesised that low risk and healthier employees are more likely to enrol in worksite health programmes, and not necessarily those most in need [38,39]. As a result it is crucial to develop strategies to include all workers starting by investigating reasons for non-participation. In the previous paragraphs it was concluded that lifestyle behaviour is an important factor for the existence and increase in unhealthy body weight with health-impairing consequences. Since several risk factors are present in this particular group of workers, and potentially large health benefits can be obtained it seems justified to develop a sector specific approach. To increase likelihood of effectiveness, interventions should be developed systematically, need a theoretical basis, and should match the context and the target population [40,41]. Interventions designed for other target groups might not be suitable for this specific occupational group. Tailoring of WHP is relevant to address specific health concerns and health behaviours in construction workers, the specific work conditions and characteristics of the work setting.

Organisational factors that are involved in adoption of evidence-based interventions should also be included in the evaluation of the programme. Providing employers with information on the potential benefits of WHP, for example by including financial return data in the evaluation of programmes, might be an incentive for employers to invest in these activities [42,43]. This might also lead to increased implementation of research results into practice.

Therefore, research is needed to gain more insight into the feasibility and (cost-)effectiveness of preventive measures in evidence-based intervention programmes, and to support organisational decision making.

Aims and outline of this thesis

Following the rationale in the previous paragraphs, the primary aim of this thesis is to examine the effect of a tailored intervention developed in consultation with the target population and management of a construction company. To gain insight into prevention possibilities for overweight/obesity and musculoskeletal symptoms in blue collar workers it is important to further explore the relation between these major health concerns. Therefore, the current thesis addresses the following objectives:

- 1) To provide insight into the association of overweight/obesity and musculoskeletal symptoms,
- 2) To describe the systematic development of a worksite intervention tailored to a specific group of workers,
- 3) To evaluate this newly developed intervention on its (cost-)effectiveness and evaluate the process of implementation.

First, **chapter 2** addresses the association between the central health problems in this thesis, overweight and musculoskeletal symptoms. It additionally examines the hypothesised interaction with work-related physical exposure.

The second objective is introduced in **chapter 3**, describing the process of systematic development of the intervention and its evaluation plan. **Chapters 4 to 7** describe the evaluation of the programme, and the trial results are presented in these chapters. **Chapter 4** describes the results of the process evaluation following the RE-AIM framework. In **chapter 5** the effects on physiological and behavioural outcomes are evaluated, and **chapter 6** investigates the effects on musculoskeletal symptoms and several work-related outcomes. The purpose of **chapter 7** is to explore the cost-effectiveness and return-on-investment of the VIP in Construction intervention from a societal as well as employer's perspective.

Finally, this thesis concludes with a general discussion in **chapter 8**, where the findings of this thesis are summarised and discussed. After discussing the applied theoretical model, methods, and results, future directions for research as well as practice are given.

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