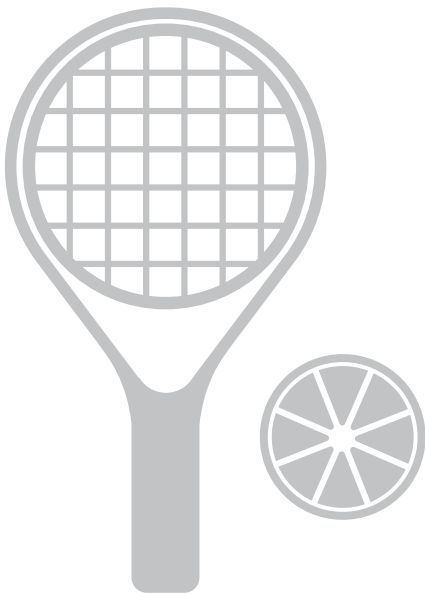


# Chapter 1

## General Introduction



### **Case description**

*The vast amount of publicity on health and economic consequences of overweight and obesity triggers a large company to inquire their occupational physician (OP) about the possibility of a health promotion campaign among their workforce. The OP reflects that the health status of the employees is largely unknown. Together with the employer, he decides to perform a pilot study to assess the current health status of employees. From the voluntary health risk appraisal the OP finds that few employees comply to the Dutch public health norms for a healthy body weight, physical activity and nutrition. Among employees, some respond positive and ask the OP for follow-up advice on how to improve their lifestyle. Others do not appreciate further interference with their lifestyle. The employer asks the OP what he can do to improve employees' lifestyle, against what costs and what outcomes. The OP turns to the Netherlands Society of Occupational Medicine (NVAB) to inform what is known about preventing weight gain, but is informed that specific evidence-based methods, strategies and tools for OPs are lacking. The main question of the OP, the employer, and the employee that will be addressed in this thesis is: how can weight gain be successfully prevented by a workplace health promotion program, in order to reach and maintain a healthy workforce?*

Over the last years, attention for preventing weight gain and for treating obesity has increased substantially. Today, numerous studies are published on preventing weight gain, public health initiatives arise and more occupational health services are providing workplace health promotion programs [1-3]. Despite this increased attention, preventing weight gain in occupational health is still relatively new [4]. Like most innovations, weight gain prevention programs will not automatically succeed or be adopted rapidly, unless they have proven efficacy and are tailored to the needs of all stakeholders [5]. Fulfilling the promise of weight gain prevention requires a systematic program, that is evaluated on successes and that identifies and overcomes barriers, and which will facilitate widespread diffusion and adoption of knowledge, skills and tools. This introduction describes the problem of overweight and obesity, and provides the rationale and barriers for preventing weight gain viewed from relevant stakeholders as mentioned in the case; employers, employees, and OPs.

### **Epidemiology of overweight and obesity**

The worldwide increasing prevalence of overweight and obesity is a well recorded, growing problem [6]. The most recent population estimates for the Netherlands show that 35% of the adults is overweight and 12% is obese [7]. Among the working population, over 30% is overweight and around 6% is obese [8]. The percentage of overweight adults seems to have stabilized during the last years. The percentage of obese adults however, continues to increase [7].

Overweight and obesity are defined as conditions of abnormal or excess body fat accumulation in adipose tissue, to the extent that health may be impaired [6]. Numerous epidemiological studies have shown a relationship between excess weight, abdominal fatness and the risk of a wide range of illnesses, including type II diabetes, cardiovascular diseases,

and various cancers [9,10]. Moreover, overweight and obesity have been associated with musculoskeletal disorders, psychosocial problems, and depression [11]. As a result of the increasing overweight-related morbidity and mortality, health care costs have increased. For the Netherlands, annual costs attributable to obesity amount up to 887 billion Euros, a relative economic burden of 0.2% of the national gross domestic product [12].

Although treating obesity is associated with improvements in obesity-related comorbidities, the long-term success of obesity treatment is limited, mainly due to biological and behavioral stimuli to regain weight. Since overweight and obesity, as well as their related morbidity and mortality, are for most part preventable, interventions aimed at preventing weight gain seem the logical choice [6].

The increased prevalence of overweight and obesity over the past decades is caused by a combination of societal, environmental, and genetic influences. The primary cause for this epidemic is thought to be changes in our daily physical (in)activity and nutrition behavior, as a result of urbanization and wealth [13]. The increased availability of cheaper food, large portion sizes and the influence of commercials increased our energy intake, while at the same time work-related activity declined and leisure-time inactivity (dominated by television viewing and computer usage) increased over recent decades in industrialized countries [14]. These changes led to a so-called 'obesogenic environment', characterizing an environment that promotes unhealthy food choices and discourages physical activity [15]. One of the major challenges of this century seems to be creating environments that are supportive for making the healthy choices at several levels, such as agriculture, food services, education, transportation, and urban planning, but also changes within homes, individual behavior, and workplaces [3].

### **Rationale for preventing weight gain at the workplace**

The workplace presents a useful setting for preventing weight gain as a major part of the adult population can be reached, in groups as well as individually [16,17]. The workplace allows for relatively straightforward communication and information exchange, and provides social and organizational support structures that can help guide certain behaviors and discourage others [17]. Support for such programs have been reported among employees, employers, and occupational health service providers for several reasons.

Employers increasingly recognize that they can serve their own (economic) interests by engaging in workplace health promotion. Several reports have shown that employees with poor modifiable lifestyle habits such as physical inactivity, poor diet or obesity are less productive, are more likely to be absent, and have higher disability rates [18-20]. In addition, workers in poor health have higher medical costs, workers' compensation expenses, and higher employee turnover [17]. Workplace health promotion can improve workers health, employee satisfaction, organizational atmosphere, and may even reduce sickness absence [16], presenteeism [21], and total organizational costs [22]. In light of the challenges employers face for the future, such as retirement at higher age, a rapidly aging workforce, a growing number of employees with chronic diseases, and fewer young people who enter the workforce, improving employees lifestyle is considered a potentially effective tool to

maintain a productive workforce, and prolong or sustain healthy employability of workers for the future [23]. Moreover, promoting employees health may provide an essential advantage for recruitment and retention of talented young employees in a competitive labor market [24]. Thus, employers may not just perceive investing in workers health as the cost of doing business, but as an investment in their human capital.

Employees, as a targeted population, also recognize that they can benefit from workplace health promotion programs. Reasons to participate in lifestyle interventions by employees are for example improving or maintaining health, preventing complaints, and providing direct benefits to the employer or the greater good [25].

A key role in preventing weight gain can be provided by occupational health professionals. In the Netherlands, employers can contract certified multidisciplinary occupational health services or individual occupational physicians to assist them with occupational health and safety, and with sickness absence management. This occupational health care is aimed at: 1. providing safe working conditions for employees, 2. preventing work-related diseases; 3. facilitating participation of employees with and without limitations and 4. improving functioning at work. Over the last years, a shift from sickness absence management to prevention has been seen due to substantially reduced sickness absence and disability rates. Moreover, due to competition in the occupational health market more employers and OPs recognize the need, and are willing, to intervene on the growing population of employees at risk for illness due to overweight and obesity. This shift now provides OPs with opportunities to conduct preventive activities [2].

### **Barriers to preventing weight gain**

Despite the mutually beneficial goal - improving employees' health - initiatives are performed by a small part of employers [17] and occupational health professionals [26]. Several reasons have been stated by employers, employees and OPs that may explain this. First, many employers are not convinced that such programs can prevent weight gain, improve health or achieve a positive financial return on investment. There is indeed some evidence that health promotion interventions have limited use in general populations [27]. In addition, some employers do not feel responsible for their employees health, do not want to interfere with employees personal lifestyles, or do not see a business purpose [28]. Even among employers who support workplace health promotion initiatives, there is often some reluctance to initiate such programs because financial gains may only be achieved after a number of years.

Among employees, the question arises why it is necessary for them to change their lifestyle, as reflected in their low participation rates. Frequently reported reasons for non-participation among employees are that they feel healthy, already adopted a healthy lifestyle, have other pressing health problems, or lack confidence that they can change their behavior [29,30]. On the other hand, several studies have shown that (especially overweight and obese) employees may not accurately perceive their weight and health risks, and do not recognize advantages of improving health [31]. Finally, some employees simply question the intention of the employer [28] or mistrust the independent position of the OP [26].

Among OPs, main barriers to implement weight gain prevention interventions are the lack of knowledge and evidence-based methods and strategies [4]. Today, the majority (75%) of OPs still perform tasks concerning sickness absence management and return to work, and only 4% of the OPs time is spent on preventive activities concerning lifestyle and vitality [26]. Furthermore, of the few OPs who perform lifestyle interventions via occupational health care, the strategies vary, and are not based on the latest evidence [4]. Nevertheless, 70% of the OPs want more opportunities to conduct preventive activities concerning employees lifestyle [26]. To meet this need, ways have been sought to support OPs to play a more active - key - intervening role with regard to preventing weight gain.

### **Guideline on preventing weight gain**

Since 1999, the Netherlands Society of Occupational Medicine (NVAB) has been developing and disseminating evidence-based practice guidelines, which are one of the most promising and effective tools for improving the quality of occupational health care [32]. Practice guidelines are “documents with recommendations to assist practitioners and care users, aimed at improvement of quality of care, based on a systematic review of evidence and an assessment of the benefits and harms of alternative care options, and supplemented with expertise and experiences of practitioners and care users” [33]. Guidelines generally describe optimal situations, rather than formulating recommendations for existing situations. Thereby, guidelines can improve the quality of health care by enhancing professionalization, transparency, and efficiency as well.

Practice guidelines are particularly useful if they contain new evidence with an important impact on health management; if there is a large variation in current practice; and if they affect many individuals at high risk or involve such high costs that even small changes in practice could have major impact on health outcomes or resources. An occupational health guideline aimed at the prevention of weight gain may therefore be important because 1) there is a need to address overweight on a larger scale in the Netherlands, as overweight is associated with an enormous public health impact as well an economic burden, 2) it enhances the professional quality of OPs and 3) it provides OPs with a practical guideline on how to advice on preventing weight gain.

### **Promising practices for the guideline**

In order to successfully prevent weight gain of employees, all important stakeholders need to collaborate. Although the objective may be clear, the “how to” often remains difficult. Information on the effectiveness and feasibility of implementing primary prevention lifestyle interventions for OPs was summarized in a previous review [4]. Moreover, key principles of successful worksite health promotion programs have been summarized by Sparling (2010) [34]. Their results described positive effects of (worksite) physical activity interventions on physical activity levels, as well as on some relevant health-related outcomes (e.g. body fat percentage). Positive effects were also concluded for dietary interventions on the intake of fruit, vegetables, and fat. As to the prevention of weight gain, interventions that incorporated both physical activity and diet were particularly effective. The majority of the

effective interventions included tailored, stage-based counseling, education, incentives and management commitment. Further, most successful interventions consisted of for example systematic health assessments, tailored feedback, and regular follow-up in order to help employees initiate or sustain healthy behavior. Also, interventions striving for sustained environmental and policy changes that can support healthy behavior of all employees were described as potentially most effective. An advantage of programs that are open to all employees is that they could reach large populations that would not normally be exposed to organized health improvement initiatives.

### **Evaluation of the guideline**

Despite these insights in promising practices, employers and occupational health professionals often lack the knowledge and experience to design, implement, and evaluate a guideline that may achieve desired outcomes [35]. Moreover, although guidelines contain best evidence and practice recommendations, it is not clear whether such recommendations will enhance the quality of care, i.e. lead to improvements on employee health, adoption of the guideline by occupational health professionals, and to improvements on employer relevant outcomes such as productivity, sickness absence and costs. Systematic evaluation of the guideline on effects, process, and success or fail factors can thus provide relevant insights in the potential of the guideline on these outcomes, and for translation into occupational health practice.

### **Objectives**

The central aim of this thesis is to contribute to improving employee health via occupational health care according to an evidence-based guideline aimed at preventing weight gain among employees in the Netherlands. First, we developed the draft guideline in 2008 from literature, interviews with relevant stakeholders, and consensus among a guideline working group consisting of practitioners and experts. Second, we evaluated the (cost-) effectiveness of the guideline on behavior-related outcomes (physical activity, sedentary behavior and nutrition), body weight-related outcomes (waist circumference, body weight and BMI), health-related outcomes (blood pressure, cholesterol and quality of life), and work-related outcomes (sick leave and productivity) during 18 months follow-up. In a randomized controlled trial, we compared the effects of working according to the guideline by OPs during a 6-months intervention period to usual care, which generally consisted of a health risk appraisal with anthropometric measurements and a subsequent health advice. Third, this thesis focused on the quality of the process of occupational health care, and identified barriers and facilitators to implementation and continuation of the guideline. Based on this thesis, the Netherlands Society of Occupational Medicine will decide on adjusting and (after authorization) publishing the guideline together with several implementation aids.

**Outline of this thesis**

Chapter 2 describes a meta-analytic review that was conducted to examine the effectiveness of workplace interventions targeting physical activity and dietary behavior on body weight-related outcomes. In chapter 3, the development of the draft occupational health guideline is presented, as well as the design for evaluation and implementation of the guideline. Chapter 4 presents the process evaluation, that examines how the intervention was administered. The short-term results on behavior-related outcomes (physical activity, sedentary behavior and nutrition) and body weight-related outcomes (waist circumference, body weight and BMI) are described in chapter 5. The long-term results on body weight-related outcomes, CVD-risk factors (blood pressure, cholesterol) and quality of life are presented in chapter 6. In chapter 7, the results are presented of an economic evaluation performed alongside the trial. Chapter 8 presents the results of interviews among OPs and employers on barriers and facilitators to implementation and continuation of the guideline. In chapter 9, we aimed to clarify the magnitude of measurement error of waist circumference, as well as what constitutes a clinically relevant change, as the consequences of errors in measuring waist circumference are unclear for clinical practice. The thesis concludes with a general discussion in chapter 10. Finally, this thesis contains a summary in English and Dutch.

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