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# WORKPLACE HEALTH PROMOTION AND EMPLOYEE HEALTH IN MUNICIPAL SOCIAL CARE ORGANIZATIONS

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# Workplace health promotion and employee health in municipal social care organizations

## THESIS FOR DOCTORAL DEGREE (Ph.D.)

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To Alva and Märta

## ABSTRACT

*Background:* People working in social care constitute the largest occupational group in Sweden and they have the highest prevalence of sickness absence. Since sickness absence results in great human and societal costs, there is incentive to develop initiatives to promote health for this group. Previous research about both what measures are effective and how soon effects occur are limited and more knowledge about this is needed.

*Aim:* The overall aim of the thesis was to gain more knowledge about associations between workplace health promotion and employee health, sickness absence, and sickness presence in municipal social care organizations.

*Method:* Four studies were conducted concerning social care organizations and their employees in 60 Swedish municipalities, based on data from registers as well as from surveys to employees, top managers, and policy makers, respectively. A randomized sample of 60 of the 290 municipalities in Sweden and a randomized sample of 15,871 people employed at least half time throughout 2006 within the social care sector in these 60 municipalities was used. A questionnaire was sent to the employees selected (9270) and 58% replied (study I-IV). Another questionnaire was sent to top managers who represented the employer in the same 60 municipalities (n=60) (study II). A third questionnaire was sent to policymakers in the 60 municipalities (study III). Register data was obtained on sickness absence (>14 days) in 2006 for the 9270 employees and on long-term sickness absence (>90 days) in 2007–2012 for all social service workers in the 60 municipalities. Both cross-sectional (study I–II and IV) and prospective (study III) study designs were used, using individual level data (study IV) and organizational level data (study I-III). Descriptive statistics, bivariate and multiple linear and logistic regression analyses, and structural equation modelling analyses were performed.

*Results:* Organizations that had more favorable employee ratings of individual- and organizational-directed (psychosocial work conditions) workplace health promotion measures had better health and lower sickness absence levels among their employees (study I). Organizational- and individual-directed workplace health promotion measures and employee satisfaction with workplace health promotion measures were associated with better employee health (study II). There was an association between provision of organizational-directed workplace health promotion measures (prevention program) and future lower levels of long-term sickness absence (study III). There were associations present between the use of health profile assessment and fitness activities and a lower odds ratio of being sickness present (study IV).

*Conclusions:* There were low or moderate associations between provision/use of workplace health promotion for individual and/or organizational approaches and lower levels of poor self-rated health, lower future incidence of long-term sickness absence, and lower odds ratio for sickness presence.

## SAMMANFATTNING

*Bakgrund:* Anställda inom vård och omsorg utgör en stor del av de yrkesverksamma i Sverige och är också den grupp som har högst prevalens av sjukfrånvaro. Utveckling av hälsofrämjande insatser är motiverade för denna grupp, eftersom sjukfrånvaro innebär stora kostnader för både den enskilda individen och för samhället. Tidigare forskning om vilka åtgärder som är effektiva och hur snabbt de kan ha effekt, är begränsad och mer kunskap behövs.

*Syfte:* Det övergripande syftet med avhandlingen var att få fördjupad kunskap om samband mellan hälsofrämjande åtgärder på arbetsplatser och anställdas hälsa, sjukfrånvaro, och sjuknärvaro i kommunala vård- och omsorgsorganisationer.

*Metod:* Fyra studier om vård- och omsorgsorganisationer och deras anställda i 60 svenska kommuner genomfördes, baserat på data från såväl register som enkäter till anställda, förvaltningschefer respektive beslutsfattare. Först genomfördes ett slumpmässigt urval av 60 av Sveriges 290 kommuner. Därefter genomfördes ett slumpmässigt urval av 15.871 personer som var anställda minst halvtid inom vård och omsorg i dessa 60 kommuner under år 2006. En enkät skickades till dessa anställda och 58 % svarade (studie I-IV). En annan enkät skickades till förvaltningscheferna, som representanter för arbetsgivaren i samma 60 kommuner (n=60) (studie II). En tredje enkät skickades till beslutsfattare i de 60 kommunerna (studie III). Registerdata införskaffades över sjukfrånvaro (>14 dagar) för år 2006 för de 9270 anställda samt över långtidssjukfrånvaro (>90 dagar) för åren 2007-2012 för alla vård- och omsorgsanställda i de 60 kommunerna. Tre tvärsnittsstudier (studie I-II och IV) och en prospektiv studie (studie III) genomfördes. En av studierna gällde individnivå (studie IV), de andra tre gällde organisatorisk nivå (studie I-III). Deskriptiv statistik, bivariata samt multipla linjära och logistiska regressionsanalyser och strukturell ekvationsmodell genomfördes.

*Resultat:* Organisationer där personalen skattade individ- och organisationsinriktade (psykosociala arbetsmiljöförhållanden) hälsofrämjande åtgärder högre hade högre nivåer av självskattad hälsa och lägre nivåer av sjukfrånvaro bland sina anställda (studie I). Organisations- och individinriktade hälsofrämjande åtgärder och anställdas tillfredsställelse med dessa var relaterade till högre nivåer av självskattad hälsa (studie II). Det fanns ett samband mellan tillhandahållande av organisationsinriktade hälsofrämjande åtgärder (preventionsprogram) och framtida lägre nivåer av långtidssjukfrånvaro (studie III). Det fanns även samband mellan utnyttjande av hälsoprofilbedömning och friskvård och lägre odds ratio för sjuknärvaro (studie IV).

*Slutsatser:* Det fanns svaga eller måttliga samband mellan tillhandahållande/utnyttjande av organisations- och/eller individinriktade hälsofrämjande åtgärder och lägre nivåer av dålig självskattad hälsa, lägre framtida incidens av långtidssjukfrånvaro, och lägre odds ratio för sjuknärvaro.

## LIST OF SCIENTIFIC PAPERS

- I. Ljungblad C, Granström F, Dellve L, Åkerlind I. Workplace health promotion and working conditions as determinants of employee health. *International Journal of Workplace Health Management*, 2014; 7(2): 89-104.
- II. Larsson R, Ljungblad C, Sandmark H, Åkerlind I. Workplace health promotion and employee health in Swedish municipal social care organizations. *Journal of Public Health*, 2014; 22: 235-244.
- III. Ljungblad C, Dellve L, Alexanderson K, Szücs S. A prospective study of workplace health promotion and incidence of long-term sickness absence among employees in social care organizations in 60 municipalities in Sweden. *Manuscript*.
- IV. Ljungblad C, Åkerlind I, Alexanderson K, Löve J, Dellve L. Associations between utilization of individual-directed workplace health promotion measures and sickness presence among employees in municipal social care organizations; a cross-sectional study from Sweden. *Submitted*.



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## LIST OF ABBREVIATIONS

OR	Odds ratio
SA	Sickness absence
SEM	Structural equation model
SP	Sickness presence
SRH	Self-rated health
WHP	Workplace health promotion



# 1 INTRODUCTION

This thesis is about the associations between the provision and use of workplace health promotion (WHP) measures and employee health within social care organizations in Sweden.

## 1.1 HEALTH

Health is a complex phenomenon, and its nature and relation to the concepts of illness and disease have received much attention. There are rival theories about what health is, for instance, the biomedical theory of health, where health is seen as the absence of disease, and the holistic theories of health, where health is a function of a person's ability to achieve goals. According to holistic theories, health is not necessarily incompatible with the presence of disease (Nordenfelt, 2007). In this thesis, health is considered a positive concept and a resource in people's everyday lives, in accordance with theories on health promotion (WHO, 1986), and as a person's ability to achieve his or her vital goals (Nordenfelt, 1995). In public health research, self-rating is among the most frequently used measures of health. Although it is not clear to what extent a person's self-rated health (SRH) captures the complex concept of health, several studies have demonstrated that a person's SRH predicts objective measurements of health, such as future mortality (Burström & Fredlund, 2001; DeSalvo, et al. 2005). The studies also revealed that the predictive validity of SRH has increased over time (Schnittker & Bacak, 2014). A comparison between three different SRH measures revealed no major differences, indicating the measures represented parallel assessments of subjective health (Eriksson, Undén & Elofsson, 2001).

Poor SRH has been identified as a predictor of future sickness absence (SA), especially for longer spells of SA (Marmot, et al. 1995). SA has been identified as a predictor of both future poor health (Gustafsson & Marklund, 2011) and future mortality (Björkenstam, et al. 2014; Kivimäki, et al. 2003), and been suggested as a global measure of health differentials between employees (Kivimäki, et al. 2003). The concepts of disease, illness, and SA and their interrelations have been objects of an investigation (Wikman, Marklund & Alexanderson, 2005) that showed that these concepts represent different realities. Most people in the study had an illness or complaint; fewer had a disease; and even fewer had been SA.

Another health-related concept is sickness presence (SP), in other words, going to work despite judging one's status of health as being such that one should have stayed home (Aronsson, Gustafsson & Dallner, 2000). Possible severe consequences of SP have been identified for both employees and employers in terms of future poor general health (Bergström, et al. 2009; Gustafsson & Marklund, 2011; Taloyan, et al. 2012), higher risk of serious coronary heart disease (Aronsson & Gustafsson, 2005; Kivimäki, et al. 2005), SA (Gustafsson & Marklund, 2011), and productivity loss (Schultz, Chen & Edington, 2009; Hemp, 2004). The phenomenon of SP has received increased attention in research; nevertheless, more knowledge is still needed.

## 1.2 MEASURES TO IMPROVE HEALTH IN ORGANIZATIONS

### 1.2.1 Systematic work environment management

In Sweden, employers have statutory obligations regarding the work environment. The Swedish Work Environment Authority has published directives in *Systematic Work Environment Management* (AFS, 2001:1). A focus on risks for poor health and accidents is dominant in these regulations. A systematic work environment management is defined as “the work done by the employer to investigate, carry out and follow up activities in such a way that ill-health and accidents at work are prevented and a satisfactory working environment achieved” (AFS, 2001:1, page 5). It states that systematic work environment management should embrace all physical, psychological, and social conditions important for the work environment. Further, the employer should allocate the tasks of systematic work environment management. In the demands of knowledge in the document, the aspect of promoting health is emphasized, since one of the knowledge areas mentioned is knowledge about work conditions that *promote* a satisfying work environment. The general recommendations (i.e., non-statutory), from the Swedish Work Environment Authority, explain that a satisfactory work environment is characterized by the employees’ opportunities to influence and have freedom of action and development, variety, cooperation and social contacts, i.e., the impact of leadership is emphasized as well (AFS 2001:1). In other words, the directives on knowledge in the statute book contain a promotion aspect, although the directives on actions do not.

Previous research about systematic work environment management is limited (Robson, et al. 2007). A few studies have revealed cross-sectional associations between systematic work environment management activities and higher worker satisfaction with these activities, better physical and psychosocial work environment, and a lower prevalence of musculoskeletal symptoms (Torp, Riise & Moen, 2000). Prospective associations have been identified between improved work according to systematic work environment management, and increased satisfaction with systematic work environment management activities, improved managerial and colleague support, and increased participation in systematic work environment management activities (Torp & Moen, 2006). One study focused on systematic work environment management in municipal human service, identifying the importance of well-organized structure and routines of systematic work environment management for lower SA (Dellve, Skagert & Eklöf, 2008).

### 1.2.2 Workplace health promotion (WHP)

Since a majority of the working age population in Sweden spend a large part of their time at work, the workplace has the potential to positively contribute to people’s physical, psychological, and social health and wellbeing (Åkerlind, Schunder & Frick, 2007). Traditional occupational health and safety activities are characterized by a focus on risk reduction and disease prevention, targeting individuals and the physical work environment. Such actions have improved work environments considerably. However, the need to move beyond this to WHP activities has been emphasized (Åkerlind, Schunder & Frick, 2007). Health promotion involves the process of enabling people to increase control over their determinants of health and to improve their health (WHO, 1986). Health promotion attempts to reinforce people’s own abilities to ameliorate their health by creating supportive

environments and contexts in which improvements of health are possible. The idea of viewing the workplace as a setting for health promotion was first launched in *The Ottawa Charter for Health Promotion* (WHO, 1986), and thereafter in the *Luxembourg Declaration on Workplace Health Promotion* (WHP) (ENWHP, 2007). So, occupational health and safety activities are still needed, but complementing them with WHP makes it possible to develop health promotion strategies within working life.

*The Luxembourg Declaration* (ENWHP, 2007) states that improved employee health can be achieved by a combination of improvement of work organization and work environment, promotion of active participation and encouragement of personal development. “WHP is a modern corporate strategy which aims to prevent ill-health at the workplace, to enhance health potential and to improve wellbeing at work. By including elements such as organizational and human resource management, WHP takes on a broader dimension than traditional occupational safety and health” (ENWHP, 2004, page 11). In the year 2000, the European Network of Workplace Health Promotion (ENWHP) stated two reasons for the current activity in WHP: 1) a start of a reorientation of traditional occupational health and safety legislation and practice and 2) an increasing imaging of the workplace as a public health setting. The European Union encourages all member states to place WHP high on their agendas and to embody issues of workplace health in all respective policies.

In Figure 1, which is modified from Shain and Kramer (2004), WHP is illustrated as being built upon at least two hypotheses about what employee health is a product of: the individual behavior and the work environment. Based on the hypothesis that health is a product of individual behavior, the workplace is seen as an arena in which various measures can be offered to improve personal health practices. Based on the hypothesis in which the focus is on the environment and its impact on health, the organization is seen as having an influence on health in regard to both physical and psychosocial aspects of the work environment (Shain & Kramer, 2004).



**Figure 1. Hypothesis of associations between WHP and employee health and productivity. A model modified from Shain & Kramer (2004).**

This fragmentation of primary focus of WHP measures is common. WHP has been described as including approaches focusing on either behavioral change among employees or on a holistic system-oriented thinking aimed at changing physical, social, and organizational factors at work (Torp, Eklund & Thorpenberg, 2011). The terms individual-directed and organizational-directed WHP measures have been suggested (Noblet & LaMontagne, 2006), as well as individual-directed and environment-directed measures (ENWHP, 2007). In a similar kind of fragmentation, the concepts of relational prevention measures and behavioral prevention measures are used (Plath, et al. 2008). Linnan and colleagues (2008) divide WHP measures into programs, activities, screenings, and disease management versus work environment programs or policies, while Ulmer and Groeben (2005) use a threefold approach of risk assessment versus measures of behavioral prevention versus measures for health-promoting work organization and job design. In this thesis, the terms individual-directed and organizational-directed WHP measures are used. Below individual- and organizational-directed WHP measures will be presented more in depth.

#### *1.2.2.1 Individual-directed WHP measures*

Despite the theoretical fragmentation into two foci in WHP (i.e., individual-directed and organizational-directed WHP measures), literature reviews about work-health interventions indicate that the main focus still is individual employee health behavior, rather than the employee's working conditions and the organization (ENWHP, 1999; Harden, et al. 1999; Giga, et al. 2003; Caulfield, et al. 2004; Della, et al. 2008; Torp, Eklund & Thorpenberg, 2011). Criticisms of this individual approach have been summarized by Noblet and LaMontagne (2006) as being both ethically unsound and not supported by occupational health and safety legislation or health promotion principles. Additionally, they are criticized in general for not being effective in ensuring sustainable benefits for the employee or the organization. In studies about the impact of personal health practices on the health of employees, Shain and Kramer (2004) regard organization of work as the most confounding factor of all. More than twenty years ago, Karasek (1992) also pointed out "organizational-level" interventions as being more desirable than "individual-level" interventions to address the roots of unhealthy working conditions.

Previous research about individual-directed WHP measures was mainly performed within the areas of physical activity, nutrition, and smoking. There is research supporting the role of individual-directed WHP measures (e.g., exercise and promotion of healthy lifestyle), in improving health and reduce SA (Kuoppala, Lamminpää & Husman, 2008). However, reviews about WHP interventions aimed at increasing physical activity reveal that these types of interventions might be effective, but that the results in general are inconclusive (Dugdill, et al. 2008; Malik, Blake & Suggs, 2014). There is also research about physical activity and SA, which, however, shows limited support for the effectiveness in reducing SA (Amlani & Munir, 2014).

Previous research about associations between WHP measures and SP is very limited. One study found indications that WHP programs comprising, for example, health risk screening, individually framed programs, and supportive workplace culture were associated with lower SP (Cancelliere, et al. 2011).



### *1.2.2.2 Organizational-directed WHP measures*

In research and practice concerning the work-health relationship, the traditional focus on the individual employee and the physical environment has been complemented by a growing interest in the organization of work (Gellatly & Luchak, 1998; Wilson, et al. 2004; Della, et al. 2008). The associations between organizational factors and health have been demonstrated in a growing number of studies (Lundstrom, et al. 2002; Marklund, Bolin & von Essen, 2008; Piirainen, Räsänen & Kivimäki, 2003; Vahtera, et al. 2000; Michie & Williams, 2003). Regarding the organizational aspect in the model by Shain and Kramer (2004), the authors had already argued ten years ago that there was much more literature on the physical factors than on the psychosocial aspects. Factors related to the psychosocial work environment can be viewed as indications of organizational-directed WHP measures. Previous research about the associations between psychosocial work environment and employee health is extensive, while more knowledge is needed about the measures. The importance of psychosocial factors as predictors of stress has been highlighted. Among health care workers, psychosocial factors were identified as stronger predictors of stress than patient-related factors (e.g., dementia) (Testad, et al. 2010). In reviews about psychosocial work environment factors, aspects of leadership (Bronkhorst, et al. 2014; Kuoppala, et al. 2008) and of group climate (Bronkhorst, et al. 2014) have been suggested to have an impact on employee health. In addition, cross-sectional associations have been revealed between both poor organizational climates and SA (Holmgren, Hensing & Dellve, 2010; Piirainen, Räsänen & Kivimäki, 2003) and between leadership aspects (supportive, fair, empowering leadership) and health (Testad, et al. 2010). Prospective studies have shown associations between psychosocial work factors and SA (Lohela Karlsson, Björklund & Jensen, 2010). More specifically, prospective associations between exposure to role conflicts and long-term SA (Aagestad, et al. 2014; Lund, et al. 2005), and between low supportive leadership and long-term SA (Aagestad, et al. 2014) have been revealed. Kelloway, Teed, and Kelley (2008) state in their review about psychosocial work environment that much is now known about environmental factors leading to stress, while knowledge still is needed about organizational interventions, preferable with a positive focus. Other needs for knowledge that have been highlighted regarding the psychosocial work environment are aspects of communication and participation (Bronkhorst, et al. 2014) and of leadership (Kuoppala, et al. 2008) in relation to health.

Previous research about organizational-directed WHP measures is, however, scarce. Some studies describe the prevalence of WHP activities (Linnan, et al. 2008; Plath, et al. 2008) and changes in prevalence over time (Ulmer & Groeben, 2005). Linnan and colleagues (2008) identified a positive association between the amount of WHP activity and the number of employees in the organization. Further, they found that a comprehensive approach to WHP was uncommon, but was significantly more likely to occur in worksites with a staff person responsible for health promotion. Ulmer and Groeben (2005) found that a number of organizations with at least a satisfying level of WHP, increased from baseline to time for follow-up between 1997 and 2003. They also identified a dominance of risk assessments and behavior prevention activities compared to health promoting work activities, which is opposite to Plath and colleagues (2008), who found a dominance of relational prevention measures. A few earlier studies have investigated the importance of organizational-directed WHP measures. For example, a cross-sectional study identified that strategies and procedures regarding management of leadership, employee development, communication, employee

participation, and health were associated with low SA levels at an organizational level (Stoetzer, et al. 2014). In a prospective study within the social care sector, organizational-directed WHP measures as well as more comprehensive WHP-measures had a bearing on the degree of SA among employees (Dellve, Skagert & Vilhelmsson, 2007).

### 1.2.2.3 *Comprehensive approaches*

The importance of addressing both individual health behavior and the work environment in order to promote employee health has been highlighted (Bond, 2004; Shain & Kramer, 2004; Stokols, Pelletier & Fielding, 1996). A comprehensive approach to WHP that combines both individual-directed and organizational-directed interventions is advocated (Chu, et al. 2000; Noblet & LaMontagne, 2006; Shain & Kramer, 2004; ENWHP, 2007; Goldgruber & Ahrens, 2010). According to Chu and colleagues, by 2000 a reorientation of WHP to a more holistic approach, incorporating both individual-directed and organizational-directed measures had taken place. An integrated approach to work health has been defined as “a *strategic and operational coordination of policies, programs, and practices designed to simultaneously prevent work-related injuries and illnesses and enhance overall workforce health and wellbeing*” (Sorensen, et al. 2013, page 13) (i.e., both prevention and promotion and both individual and organizational levels are emphasized).

WHP has been described as not using the workplace as a convenient place for health promoting activities, but rather as involving both management and employees together in trying to change the workplace to become a health-promoting setting (Chu, et al. 2000). Goldgruber and Ahrens (2010) define health-related interventions in the same way, but in terms of behavioral prevention (employees) and relational prevention (work environment). In other words, WHP comprises both organizational-directed and individual-directed strategies. While taking a comprehensive approach of WHP is advocated, there is inconsistency as to what is meant by this. Stokols, Pelletier, and Fielding (1996) refer to social ecological models that emphasize the importance of a comprehensive approach that incorporates the combined influence of environmental and individual factors on employee health. According to ENWHP (2007), however, the comprehensive approach in WHP includes both promotive and preventive efforts. Chapman (2005), on the other hand, distinguishes single program components/interventions from more comprehensive program interventions, however, includes interventions such as programs with physical activity, smoking cessation, stress management etcetera in the examples of comprehensive programs. Different notions of WHP have been defined: strategy of behavior prevention at the workplace, part of extended occupational safety and health, a strategy to make an impact on important determinants of health at work, a strategy to reduce absenteeism, and finally, a part of organizational development (Chu, et al. 2000). The lack of a uniform European approach to WHP has been highlighted (Chu, et al. 2000), and the need for future research on long-term effects, multi-component programs, and programs addressing environmental determinants of health behavior has been emphasized (Bauer, 2007).

## 1.3 SOCIAL CARE ORGANIZATIONS

Employees working in the social care sector constitute the largest occupational group in Sweden. Numerically, this group is female dominated and in general has higher SA rates compared to those of the general population. Around half a million women work within

social care (not including employees with a university or college education); this occupational group potentially generate a large number of sick-listed individuals (Försäkringskassan, 2014). Previous studies reveal higher incidence of both long-term SA and disability pension among female compared to male social care workers (Dellve, et al. 2006). Important risk factors for work disability are time pressure, insufficient management, relational problems at work, and poor organizational support; in addition, co-working opportunities and work climate have been identified as important for a lasting ability to work (Dellve, Lagerström & Hagberg, 2003). Employees in the care and welfare sector have been identified as at higher risk of SP compared to other employees (Aronsson, Gustafsson & Dallner, 2000), and the need to investigate SP in the health care area has previously been emphasized (Middaugh, 2006).

All the personnel included in this thesis were publicly employed by the municipalities. The municipalities provide similar work situations regarding legislated employment conditions and collective agreements, although, for example, organization, leadership, management, and culture may differ some between municipalities. As there are many factors that are alike, it might be possible to crystalize working-life factors that are important for employee health. There are some previous studies in the social care sector about socio-demographic, organizational, and individual factors associated with employee health and ability to work (Dellve, et al. 2006; Dellve, et al. 2011; Larsson, et al. 2012). There are also studies targeting associations between WHP measures and outcomes such as physical activity and/or nutrition, and health (Jonsdottir, et al. 2010) and workability (Flannery, Resnick & McMullen, 2012). The nature of work in the social care sector involves having close contact with and responsibility for the wellbeing of patients/clients. Accordingly, relational-focused leadership has been seen as especially requested within this sector (Nielsen, et al. 2008) and this kind of leadership has been identified as a possible contributor to enhanced staff health and wellbeing, according to one literature review (Cummings, et al. 2010). In addition, the need to investigate salutogenic relations between work factors and employee health has been emphasized (Bringsén, 2010).

## **2 AIMS**

### **2.1 GENERAL AIM**

The overall aim of the thesis was to investigate associations between WHP and employee health, sickness absence, and sickness presence in municipal social care organizations.

### **2.2 SPECIFIC AIMS**

The specific aims are:

- to investigate employee-reported, organizational- and individual-directed WHP measures in relation to employee self-rated health, and sickness absence (study I);
- to investigate provision of individual- and organizational-directed WHP measures, reported by top managers, and employee satisfaction with WHP, in relation to employee self-rated health (study II);
- to investigate associations between employee-reported individual-directed WHP measures, and organizational-directed WHP measures reported by policy makers, and future incidence of long-term sickness absence (>90 days) (study III); and
- to investigate employee-reported reasons for sickness presence and associations between prevalence of sickness presence and individual-directed WHP measures (study IV).

## 3 METHOD

### 3.1 DESIGN

In this thesis, four studies were conducted of which three had a cross-sectional study design (study I-II and IV) and one a prospective design (study III). In Table 1, essential aspects of the four studies are presented.

All four studies concern associations between WHP and different aspects of health in municipal social care organizations. In three of the four studies, the organization was the unit of analysis (studies I-III), while, in the fourth, the individual was unit of analysis. The outcome measures used were SA, SRH, and SP among employees within social care. In studies I-II and IV, assistant nurses, nurses' aides, home-based personal caregivers, medical attendants, mental health support workers, and personal assistants were included. People in these occupations constitute the largest group of employees within municipal social care (about 70% of municipal social service workers). In study III, the outcome concerned all occupational groups within municipal social care (e.g., the group described above and nurses/specialized nurses, who comprise 25% of the employees, and other, 5%). Questions about WHP were responded by the following:

1. Employees (i.e., assistant nurses, nurses' aides, home-based personal caregivers, medical attendants, mental health support workers and personal assistants (study I, III, IV) (provision and/or utilization))
2. Top managers (i.e., top manager of the municipal social care organization (study II) (provision))
3. Policy makers (i.e., the chairman of the municipality executive council or a person with a position corresponding to mayor), and a leading administrator (chief administrative official), as well as five other leading managers and representatives (managers of HR, social care, education, and the two leading white and blue collar union representatives (Kommunal and Vision) (study III) (provision)).

**Table 1: Overview of aim, design, study object, data, and analyses of the four included studies.**

	<b>Study I</b>	<b>Study II</b>	<b>Study III</b>	<b>Study IV</b>
<b>Aim</b>	To investigate general psychosocial work conditions and specific WHP measures in relation to employee health and sickness absence	To investigate the employers' management characteristics, their provision of WHP measures, and employee satisfaction with WHP in relation to employee health	To investigate associations between individual- and organizational-directed workplace health promotion (WHP) measures and future incidence of long-term SA (>90 days) among employees in municipal social care organizations	To investigate the prevalence of and reasons for sickness presence and possible associations with utilization of individual-directed WHP measures
<b>Design</b>	Cross-sectional	Cross-sectional	Prospective	Cross-sectional
<b>Study object</b>	Social care organizations (n=60)	Social care organizations (n=60)	Social care organizations (n=60)	Employees in the 60 social care organizations (n=8082)
<b>Data</b>	- Employee questionnaire - Register data on SA and sociodemographics	- Top manager questionnaire - Employee questionnaire	- Policy maker questionnaire - Employee questionnaire - Register data on SA	- Employee questionnaire
<b>Analyses</b>	- Spearman's correlation - Structural Equation Model analysis	- Independent t-test - Spearman's correlation - Multiple linear regression analysis	- Spearman's correlation - Multiple linear regression analysis	- Spearman's correlation - Multiple multinomial logistic regression analysis

### 3.2 DATA

Kalleberg (1994) emphasizes that when doing a study of organizations and their employees it is of importance to fulfill certain criteria in order for a dataset to be useful. For instance, the information should be gathered from a broad and representative sample. In this study, a random sample of 60 of the 290 municipalities in Sweden was included in the study population. Eight of the nine categories of municipalities, according to the classification of the Swedish Association of Local Authorities and Regions from 2005 (SALAR, 2005), were evenly represented in the sample and the sample was equally spread over the country. In the randomization, the ninth category, consisting of the three largest municipalities (Stockholm, Gothenburg, and Malmö) was not included in the sample. Because the purpose of the studies was to compare the same kind of employer in Sweden, only municipal and not private social care organizations were included. While the number of private care organizations is growing and some municipalities had a higher proportion of private organizations than others, in most municipalities the municipal social care organization was still the largest. This was also the case for the municipalities in the sample. The randomization of municipalities was performed

by the research group using a table of random numbers. Thereafter, a randomized sample of employees in each municipality was selected by Statistics Sweden. The random samples consisted of assistant nurses, nurses' aides, home-based personal caregivers, medical attendants, mental health support workers and personal assistants, employed for at least half time during 2006. In total, 15,871 employees were included in the study group. The sizes of the samples were adjusted to attain equal precision in the estimates of the populations. The samples ranged from 96 to 397 persons, with a mean value of 265 persons per municipality.

Two types of data were used: questionnaire and register.

Data from three different questionnaires were used in the studies, all concerned the 60 social care organizations:

1. In the spring of 2008, a postal questionnaire was sent to the homes of the employees sampled. The questionnaire included items about the current psychosocial work environment, leadership, self-rated health, and provision and utilization of WHP in the previous 12 months. The majority of the questions were taken from validated instruments (see below); different aspects of WHP were assessed, however, by items developed for these studies. These questions were reviewed for content validity by work health experts (i.e., researchers, organizational consultant). A cover letter explained the aim of the study and noted that participation was voluntary and data would be treated confidentially. Respondents returned their questionnaires in pre-addressed, postage-paid envelopes. Two reminders, the second one with another copy of the questionnaire, were sent to the non-responders. The sampling and the sending of the questionnaire were performed by Statistics Sweden. The response rates were 58% (n=9270: study I), and 87% (n=8082: study II-IV) of the respondents confirmed they were still working in the same sector in the same municipality as 2006. The respondents that no longer working in the same sector in the same municipality were instructed to return the questionnaire but not to answer it. However, a small minority of around 250 persons of the 1188 employees no longer working in the same sector in the same municipality, answered the questionnaire. These 1188 employees no longer working in the same sector in the same municipality were not included in studies II-IV.
2. In 2008-2009, a questionnaire was sent to the social care top manager of each organization (n=60). The questionnaire concerned organizational and management characteristics, scope and organization of WHP, and occupational health services in 2008. It was sent by e-mail to the managers' work-mail, and up to five reminders and a simplification of the questionnaire (some follow-up questions deleted) were sent to all managers or to a key informant they appointed. These data were used in study II. This questionnaire was developed for this study. The content was inspired by theoretical frameworks (ENWHP, 1999; Shain & Kramer, 2004) and the instrument Systematic Occupational Health and Safety Management (Dellve, Skagert & Eklöf, 2008). It was reviewed for content validity by a group of work health experts (i.e., researchers, organizational consultant, trade union representatives), and pretested in four municipal social care organizations.
3. A questionnaire was sent to 416 people with the status of leading politician (the chairman of the executive council, a position corresponding to mayor) and leading

administrator (chief administrative official or Kommundirektör), as well as 5 other leading managers and representatives (managers of HR, social care, education, and the 2 leading white and blue collar union representatives (Kommunal and Vision) in each of the 60 municipalities. The questionnaire was sent to the workplace/organization in 2008–2009 and asked about organizational conditions and innovation from 2007. The response rate was 68% (n=283), with responses received from all 60 municipalities. These data were used in study IV.

Register data from four sources were used in the studies, all concerning the 60 social care organizations:

1. Statistics Sweden added data from their longitudinal database for income and labour market studies (LISA) for each employee who answered the questionnaire; the data concerned age and gender as well as data for 2006 concerning SA that was reimbursed by the National Social Insurance Agency and the gross number of days with sickness benefit.
2. Data were obtained from Swedish Association of Local Authorities and Regions on the general income level and number of inhabitants in each of the 60 municipalities for 2007.
3. Data were obtained from K-Fakta on the number of inhabitants for 2009, level of unemployment (the percentage of unemployed people who were between 16 to 64 years of age) in July 2010, and local tax revenue (income in Swedish crowns per inhabitant) for the year 2010 in each of the 60 municipalities.
4. Data were obtained from registers of AFA Insurance regarding the annual municipal incidence of long-term SA (>90 days) for the years 2007–2012 among employees in care and welfare organizations in each of the 60 municipalities.

### **3.3 MEASURES**

#### **3.3.1 Outcome measures**

##### *3.3.1.1 Sickness absence (SA)*

In Sweden, all employees are covered by a general sick leave insurance that provides sickness benefits if the individual has reduced work capacity due to disease or injury. The first seven days of a sick-leave spell can be self-certified; after that, a medical certificate is also needed. There is one qualifying day without any benefits. After that, the employer provides sick pay for the first two weeks. Thereafter, the sickness benefit is paid by the National Social Insurance Agency.

The measure of SA for each employee for the year 2006 was based on the number of gross days with sickness benefit paid by the Swedish Social Insurance Agency, i.e., irrespective if the SA was for full or part time of ordinary working hours. Thus, data on the first 14 days of a sick leave were not included, which means that the measures of SA ranged from 15–365 days. SA was aggregated as mean number of sickness benefit days in each organization, and thereafter converted to a logarithmic variable in order to be approximately normally distributed.



The measure of annual municipal incidence of long-term SA for the years 2007–2012 was based on register data from AFA Insurance and covered all those employed in municipalities in Sweden. The sum of working time in each municipality was adjusted to full-time equivalent workers and used to estimate the time at risk. This measure ranged from 90–365 days for each year. The annual municipal incidence of long-term SA was calculated as:

$$\frac{\sum \text{Annual number of cases in municipality} / \text{number of FTE workers in municipality}}{n \text{ (year)}} \times 100$$

### 3.3.1.2 *Self-rated health (SRH)*

The measure of SRH was based on one question in the employee questionnaire, “How would you rate your general health status?” Response options ranged from “very poor” (=1) to “very good” (=5) on a five-point Likert-type scale (Eriksson, Undén & Elofsson, 2001). SRH were dichotomized into “not good health” (1–3) and “good health” (4–5) and aggregated as a percentage of employees with poor health in each municipality. This measure was thereafter converted to a logarithmic variable in order to be approximately normally distributed.

### 3.3.1.3 *Sickness presence (SP)*

SP was assessed by one item in the employee questionnaire, “Over the past 12 months, have you gone to work despite feeling that you really should have taken sick leave due to your state of health?” Four response alternatives were offered: “never”, “once”, “two to five times”, and “more than five times” (Aronsson, Gustafsson & Dallner, 2000).

## 3.3.2 **Explorative variables**

### 3.3.2.1 *Individual-directed WHP measures*

The following questions/assertions about individual-directed WHP were included in the questionnaire sent to employees:

- a) *Which of the following measures have you been offered (had access to) through work, and also used (participated in) during the past twelve months?* The measures listed were work environment education, employee questionnaire, fitness activities, individual work/workplace adjustment, stress counseling, health profile assessment/fitness test, medical health control, and lifestyle guidance. The response alternatives given were “not offered”, “offered but not used”, and “offered and used”.
- b) *I am satisfied with the employer’s efforts and support for health promotion and fitness (hereafter, employee satisfaction with WHP).* The response options ranged from 1 (do not agree at all) to 5 (agree completely).

The following questions about individual-directed WHP were included in the questionnaire sent to top managers:

- c) *Which of the following measures have the employees been offered (had access to) through work?* The measures were the same as in a). The response options were “internal”, “external”, or “occupational health service” (performed in-house, by external entrepreneur or by the occupational health service).
- d) *Were the following forms of support for health promoting activities were offered by the management during 2008?* The response options were “yes” or “no”. Two types of activity support to individuals were listed:
- health promoting activities during working hours
  - financial compensation for participation in health promoting activities outside working hours

### 3.3.2.2 Organizational-directed WHP measures

The following questions about organizational-directed WHP were included in the questionnaire to the top managers:

- e) *Which of the following forms of support for health promoting activities were offered by the management during 2008?* The response options were “yes” or “no”. The forms of competence support listed were:
- specifically selected health ambassadors
  - specifically employed WHP coordinator
- The forms of project support listed for the organization were:
- local health project
  - participation in work-health oriented networks for the employer

The following question about organizational-directed WHP was included in the policy makers’ questionnaire:

- f) *Over the past 30 years, a number of reform initiatives have been introduced by local governments in Sweden. Which organizational reforms are present in your municipality today or were present in the past?* Respondents were expected to indicate the status of their municipality’s reform initiatives on a scale with the following points: 0 (have not discussed), 33 (have discussed), 67 (have previously had), and 100 (have today). In the present thesis only one reform initiative was used:
- prevention program (hereafter, organizational-directed WHP)

Questions about the organizational-directed WHP (i.e., psychosocial work environment) were measured by items from the short version (QPS Nordic 34+) of the QPS Nordic (Questionnaire for Psychological and Social factors at work) (Dallner, et al. 2000). These items had five-point Likert-type scales and ended in the five single/group variables: developmental leadership, support from superior, social climate, role conflict, and appreciate the team (see Appendix).

The senior managers’ questionnaire included items about organizational characteristics, management characteristics, and occupational health services. Organizational characteristics were assessed by two items about the number of employees and subordinate managers in the organization. Five items assessed management characteristics, covering operational plans, quality management systems, and policies for human resources management, leadership and

employee participation in decision-making. Response options were yes or no. Three items concerned occupational health services: covering agreement with occupational health services, routines for needs assessment, and routines for following up of occupational health services' actions. The response options were yes or no.

### *3.3.2.3 Reasons for sickness presence*

The reasons for SP were assessed by one item with six alternatives: "negative attitude to SA on the part of management", "negative attitude to SA on the part of colleagues", "cannot afford to be sickness absent", "could not be sickness absent because of my work tasks", "loyalty to colleagues who otherwise would have had to do my work tasks", and "other". The response alternatives for each reason were "yes", "sometimes", and "no". The respondents were only to select one response per reason.

## **3.3.3 Background measures**

Background information was collected through the questionnaires to the employees and to the top managers, as presented below.

### *3.3.3.1 Organizational size*

Information about number of employees per top manager (i.e., organizational size) was measured by one item in the top managers' questionnaire.

### *3.3.3.2 Current workplace*

Information about the employees' current workplace was measured by one item (the first one) in the employees' questionnaire. It concerned whether they were still working in the same or in another unit at the same workplace. If they were not, they were asked to send the questionnaire back without responding to the other questions.

### *3.3.3.3 Education*

Information about the employees' level of education was measured by one item in the employees' questionnaire. Five response alternatives were given: comprehensive school, upper secondary school maximum two years, upper secondary school three years, post-secondary education less than three years and, finally, post-secondary education three years or longer.

### *3.3.3.4 Number of years working at current workplace*

Information about how long time the employees had been working at their current workplace was measured by one item in the employees' questionnaire. The response alternatives were 0–5 years, 6–10 years, 11–15 years, 16–20 years, and 21 years or longer.

## **3.4 THE SOCIAL CARE ORGANIZATIONS AND THEIR EMPLOYEES**

The response rate in the municipal organizations ranged from 44 to 70% (mean=58.4%), while in the subgroups (open social activities, home-help services, and sheltered accommodation) was almost the same, ranging from 56.6 to 59.5%. The response rate did not differ between the eight categories of municipal organizations (SALAR, 2005), except that

suburban municipalities had a lower response rate than all other groups. A majority (93%) of the respondents was women, the average age was 48, and the most common educational level was upper secondary school (Table 2).

**Table 2: Descriptive data concerning sex, age, and education of the study groups (n=9270: study I; n=8082: study II-IV).**

Characteristics	Category	Study group	%	Study group	%
All		9270		8082	
Sex	Women	8630	93.1	7547	93.4
	Men	640	6.9	535	6.6
Age	≤34 years	1370	14.8	1081	13.4
	35-44 years	2075	22.4	1867	23.1
	45-54 years	2759	29.8	2538	31.4
	≥55 years	3066	33.1	2596	32.1
Education	Comprehensive school	1520	16.4	1444	17.9
	Upper secondary school	4223	45.6	4086	50.6
	Post-secondary education	2535	27.3	2469	30.5
	Missing	992	10.7	83	1.0

### 3.5 STATISTICAL ANALYSES

#### 3.5.1 Study I

Study I was based on register and questionnaire data from the employees (n=9270), all aggregated to organizational level (n=60). The percentage of employees with poor health ranged from 16% to 42% (mean=0.26, SD=0.05) among the organizations.

All single items with five-point response scales of Likert-type were dichotomized to get the most balanced distribution. The dichotomized variables were aggregated as percentages of respondents with a specific response alternative in each municipal organization: the positive alternative for the explorative variables and the negative alternative for health. The number of the eight individual-directed WHP measures that each individual reported as utilized was summarized as a new variable and aggregated as mean number of WHP measures used in each municipal organization.

Bivariate Spearman correlations between all dependent and independent variables were computed. Up to this point, all data management was conducted using SPSS 16.0. Thereafter, an explorative selection of variables was tested in a structural equation model (SEM) (Stein, Morris and Nock, 2012) as predictors of health and long-term SA at the organizational level. Both direct effects and indirect effects, through mediating factors, were studied. The organization of the factors in the model was based on an iterative process aimed at finding a model that, according to model fit statistics, represented a good picture of the data. The choice of variables tested in the SEM was based both on significant bivariate correlations in the material and previous research. Variables with significant direct or indirect effect on health or SA were kept in the model. When appropriate, latent factors were created to reflect underlying effects. The psychometric properties of the latent variables were secured

by the overall statistical test of the model. Three latent variables regarding organizational-directed WHP (psychosocial work environment) were created in the SEM analysis (Appendix): a, b, and c were collected in the variable “developmental leadership”, e and f were collected in the variable “social climate”, and h, i, and j were collected in the variable “role conflict”. The goodness of fit between the model and the observed data was evaluated using  $\chi^2$  test and RMSEA (root mean square error of approximation) and CFI (comparative fit index). The model was fitted using AMOS 16.

### **3.5.2 Study II**

Study II was based on questionnaire data from the top managers (n=60) and questionnaire data from the employees (n=8082), aggregated to organizational level. The percentage of employees with poor health ranged from 17% to 41% (mean=0.26, SD=0.05) among the organizations. The top managers were asked to indicate provision of the eight individual-directed measures as being internal, external, and/or occupational health service. This item was recoded as “yes” if the respondent chose at least one of these three response alternatives and as “no” if no choice was made. Descriptive analyses were performed on the employer data. Differences in log-transformed aggregated levels of employee health between organizations with and without certain WHP measures were analyzed, using independent t-tests. After multiple testing corrections using Hochberg’s method (Hochberg, 1988), the WHP-variables with significant differences remaining were merged into two WHP indices: one organizational WHP index (i.e., implementation of local WHP projects and WHP coordinators) and one individual WHP index (i.e., health profile assessment, fitness activities, and medical health control). The internal consistency of the indices was assessed by the Kuder-Richardson formula 20 (KR-20) for dichotomous variables (DeVellis, 2003). The value for the former index was 0.74 and for the latter was 0.65. Correlations between WHP indices, employee satisfaction with WHP, and SRH were tested using Spearman’s rank correlation coefficient. Thereafter, a multiple linear regression analysis was performed investigating associations between the two WHP indices and employee satisfaction with WHP in relation to SRH. The two WHP indices were not linearly associated with the level of SRH and, therefore, recoded into dummy variables prior to the regression analysis, where the number of employees (organizational size) was used as a control variable.

### **3.5.3 Study III**

Study III was based on questionnaire data from the policy makers (n=416), questionnaire data from the employees on individual-directed WHP measures (n=8082), and register data on annual municipal incidence of long-term SA for the years 2007–2012. Data on organizational-directed WHP measures (prevention program) were aggregated into the mean value for each municipality. The individual level data on the eight individual-directed WHP measures were aggregated as a percentage of employees who had used each measure in each municipal organization. Through this procedure, continuous variables mean scores for each municipality were obtained that indicated levels of experience with the WHP measures.

The variables concerning number of inhabitants and local tax revenue were converted into number of thousands. Mean municipal incidence of long-term SA was calculated for all organizations in the study, and for all 290 municipalities in Sweden, for the years 2007–2012. Bivariate analyses were performed between explorative and outcome variables to detect significant associations. The associations found were further investigated step-by-step in linear regression models, including control for possible confounders. The validity of the models were assessed in terms of multicollinearity, homoscedasticity, extreme values, and normal distribution of the residuals.

#### **3.5.4 Study IV**

Study IV was based on questionnaire data from the employees (n=8082), and all analyses were performed at the individual level. Descriptive analysis of the reasons for SP (only those with SP once or more in the previous 12 months were included) and for the individual-directed WHP measures (six of the eight measures were included) were conducted. Bivariate correlations were performed between SP and the individual-directed WHP measures and multicollinearity between the individual-directed WHP measures was controlled for. Statistically significant associations were further investigated in multiple multinomial logistic regression analyses by including SP and one individual-directed WHP measure at a time, controlling for age and education level. All individual-directed WHP measures, SP, age, and educational level were included in one final multiple multinomial logistic regression analysis. The variables concerning individual-directed WHP measures, age, and education level were treated as categorical variables. The odds ratio (OR), 95% confidence intervals (CI), Nagelkerke, and goodness of fit of each model were calculated and the significance level used was  $p \leq 0.05$ .

All statistical analyses were performed using SPSS (Statistical Package for Social Sciences version 18 or 19) for Windows.

### **3.6 ETHICAL APPROVALS**

All studies were approved by the Regional Ethical Review Board in Linköping (03-339; 81-08; 2014/289-32).

## 4 RESULTS

The main results indicated associations between different aspects of WHP and employee SA, SRH, and SP, as presented below.

### 4.1 HEALTH INDICATORS

Three different types of health indicators were used; SA, SRH and SP.

#### 4.1.1 Sickness absence (SA)

Based on register data of the 9270 employees in study I, the majority (n=7657) had no SA periods (exceeding 14 days) (Table 3), meaning the distribution of SA days was positively skewed. The mean number of gross SA days was 13.14 days in 2006.

**Table 3: Frequency and percent of employees with different number of gross sickness absence (SA) days in 2006 (n=9270).**

Days	Frequency	%
0	7657	82.6
1-30	832	9.0
31-60	282	3.0
61-120	183	2.0
121-180	75	0.8
181-270	80	0.9
271-365	161	1.7

#### 4.1.2 Self-rated health (SRH)

The distribution of employees on this health scale was somewhat negatively skewed, although fairly normally distributed (Table 4).

**Table 4: Descriptive data concerning self-rated health (SRH) of the two study groups.**

Self-rated health	Study group (I) (n=9270)	%	Study group (II) (n=8082)	%
Very poor	43	0.5	37	0.5
Quite poor	279	3.0	265	3.3
Fairly	1817	19.6	1760	21.8
Quite good	4528	48.8	4403	54.5
Very good	1582	17.1	1533	19.0
Missing	1021	11.0	84	1.0

### 4.1.3 Sickness presence (SP)

According to employee questionnaire data in study IV, in the previous 12 months almost one-third of the study group reported no SP, while half reported SP two times or more (Table 5). Among those who reported having been SP once or more in the previous twelve months, the two most common reasons were “cannot afford to be sickness absent” and “loyalty to colleagues who otherwise would have had to do my work tasks”.

**Table 5: Descriptive data regarding sickness presence (SP) in the study group (n=8082).**

SP in the last 12 months	Study group	%
All	8082	100
None	2642	30.5
Once	1448	17.9
2-5 times	2893	35.8
More than 5 times	1154	14.3
Missing	125	1.5

## 4.2 PROVISION OF WORKPLACE HEALTH PROMOTION (WHP)

The explorative variables of WHP comprise both individual- and organizational-directed measures.

### 4.2.1 Individual-directed measures

The employee-reported data on the individual-directed WHP measures in studies I, III, and IV revealed that the most commonly offered and used measures were work environment education, employee questionnaires, and fitness activities (Table 6).



**Table 6: Descriptives of individual-directed workplace health promotion (WHP) measures reported by the employees (n=9270; n=8082).**

Individual-directed WHP measures	n=9270								n=8082					
	Response rate (%)	Not offered		Offered but not utilized		Offered and utilized		Response rate (%)	Not offered		Offered but not utilized		Offered and utilized	
		Study group	%	Study group	%	Study group	%		Study group	%	Study group	%	Study group	%
Health profile assessment/fitness test	87.5	6809	73.5	529	5.7	770	8.3	97.4	6610	81.8	511	6.3	748	9.3
Lifestyle guidance	86.9	6617	71.4	889	9.6	552	6.0	96.8	6419	79.4	864	10.7	540	6.7
Fitness activities	86.7	3605	38.9	2279	24.6	2157	23.3	96.5	3494	43.2	2217	27.4	2092	25.9
Medical health control	86.6	7208	77.8	206	2.2	614	6.6	96.5	7000	86.6	199	2.5	597	7.4
Stress counseling	86.7	6552	70.7	532	5.7	951	10.3	96.5	6376	78.9	507	6.3	918	11.4
Employee questionnaire	85.7	5358	57.8	283	3.1	2308	24.9	95.5	5200	64.3	269	3.3	2252	27.9
Work environment education	87.1	3870	41.7	422	4.6	3778	40.8	97.0	3757	46.5	404	5.0	3676	45.5
Individual work/workplace adjustment	86.5	5874	63.4	215	2.3	1928	20.8	96.4	5718	70.7	206	2.5	1864	23.1

The employer-reported data (n=60) on the individual-directed WHP measures in study II, with the two response alternatives “yes” and “no”, revealed that the most commonly offered measures were work environment education, fitness activities, and stress counseling (Table 7).

**Table 7: Descriptives of individual-directed workplace health promotion (WHP) measures reported by the employers (n=60).**

Individual-directed WHP measures	Yes		No	
	N	%	N	%
Health profile assessment/fitness test	37	61.7	23	38.3
Lifestyle guidance	45	75.0	15	25.0
Fitness activities	51	85.0	9	15.0
Medical health control	33	55.0	27	45.0
Stress counseling	51	85.0	9	15.0
Employee questionnaire	42	70.0	18	30.0
Work environment education	52	86.7	8	13.3
Individual work/workplace adjustment	48	80.0	12	20.0

#### 4.2.2 Organizational-directed measures

In regard to the organizational-directed WHP measures reported by top managers (n=59-60) in study II, the measures most frequently offered were written policy for health promotion and fitness, financial compensation for participation in health promotion activities outside working hours, and health promotion activities during working hours (Table 8). Concerning the organizational-directed WHP measures reported by persons in a leading position (n=283) in study III provision of a prevention program was common, with a mean value of 88.28 and a median value of 100.00 (0=Have not discussed; 33=Have discussed; 67=Have previously had it; 100=Have today).

**Table 8: Descriptives of organizational-directed workplace health promotion measures reported by the employers (n=59-60).**

Organizational-directed WHP measures	Yes		No	
	N	%	N	%
Written policy for health promotion and fitness	48	80.0	12	20.0
Health promotion activities during working hours	37	61.7	23	38.3
Financial compensation for participation in health promotion activities outside working hours	40	66.7	20	33.3
Health ambassadors	32	54.2	27	45.8
Local WHP project	23	39.0	36	61.0
Participation in work health-oriented networks for employers	15	25.4	44	74.6
WHP coordinator (staff entrusted with specific responsibility for co-ordination of health promotion and fitness)	32	54.2	27	45.8

## **4.3 WORKPLACE HEALTH PROMOTION (WHP) AND EMPLOYEE SELF-RATED HEALTH (SRH) – ORGANIZATIONAL LEVEL ANALYSES**

### **4.3.1 Individual-directed measures**

Bivariate associations were found in study I between a smaller proportion of employees reporting poor health and the following: a higher mean number of individual-directed WHP measures used (index of eight measures) (Spearman corr -0.44,  $p < 0.01$ ), perceived managerial interest in employee health (Spearman corr -0.30,  $p < 0.05$ ), and satisfaction with the employers' contribution to WHP (Spearman corr -0.31,  $p < 0.05$ ) (see Table 1, study I).

### **4.3.2 Organizational-directed measures**

Bivariate associations were found in study I between a smaller proportion of employees reporting poor health and higher employee scores on the following: knowing responsibilities (Spearman corr -0.38,  $p < 0.01$ ), work appreciated by superior (Spearman corr -0.28,  $p < 0.05$ ), trust the ability of the management to look after the future of the organization (Spearman corr -0.27,  $p < 0.05$ ), encouragement to do things better (Spearman corr -0.30,  $p < 0.05$ ), and appreciate being in a group or team (Spearman corr -0.30,  $p < 0.05$ ) (see Table 1, study I).

In study II, bivariate associations also revealed that the proportion of employees with poor SRH was lower in organizations with local WHP projects ( $t$ -value=4.35,  $p < 0.01$ ) and in organizations with a WHP coordinator ( $t$ -value=3.01,  $p < 0.05$ ) (see Table 2, study II) compared to organizations without these measures.

### **4.3.3 Comprehensive approach**

The SEM in study I, which comprised a comprehensive approach, provides support for a good fit to the data ( $\chi^2(83)=101.2$ ,  $p=0.08$ , RMSEA=0.06 and CFI=0.96) (see Figure 1, study I). There was a direct association between an increasing number of individual-directed WHP measures used (index of eight measures) and a lower proportion of employees with poor SRH. The results also detected stepwise associations between organizational-directed WHP conditions (i.e., psychosocial work environment factors) and employee SRH. In the model, the factors connected with leadership were indirectly linked to employees' health, mediated through two different paths. The developmental aspect of the leadership was directly related to the social climate of the organization, whereas the supportive aspect of the leadership was indirectly related to the social climate through a mediating step of reducing role conflicts. Social climate was positively connected to team appreciation, which in turn was related to employee SRH.

The multiple linear regression analysis of WHP in relation to employee SRH in study II was done in three steps, and associations were identified between organizational WHP index (i.e., local WHP projects and WHP coordinators), individual WHP index (i.e., health profile assessment, fitness activities and medical check-up), and employee satisfaction with WHP, and employee SRH (see Table 4, study II). In the final model, the organizational and individual WHP indices were associated with employee health ( $F=8.02$ ,  $p < 0.001$ , adjusted  $R^2=0.49$ ), indicating that all three levels differed significantly from the highest reference level of individual WHP, but only the lowest level differed significantly from the highest reference level of organizational WHP. In other words, not having any organizational WHP measures

compared to having two organizational WHP measures and having fewer than three individual WHP measures was associated with a higher proportion of employees with poor SRH.

#### **4.4 WORKPLACE HEALTH PROMOTION (WHP) AND EMPLOYEE SICKNESS ABSENCE (SA) – ORGANIZATIONAL LEVEL ANALYSES**

##### **4.4.1 Individual-directed measures**

In study I bivariate associations were found between the mean number of individual-directed WHP measures (index of eight measures) used and lower SA (mean number of days with sickness cash benefit (>14 days)) (Spearman corr -0.37,  $p < 0.01$ ) (see Table 1, study I). In a SEM, an indirect association was revealed between a higher mean number of individual-directed WHP measures used via employee SRH (see 4.3.3) and lower SA (see Figure 1, study I).

Bivariate associations were also revealed in the prospective study III. The mean proportion of employees who had used a health profile assessment/fitness test was related to a higher incidence of long-term SA at the two-year follow-up (Spearman corr, 0.26,  $p < 0.05$ ). The mean proportions of employees who have used fitness activities (Spearman corr. -0.28,  $p < 0.05$ ) and employee questionnaire (Spearman corr. -0.395,  $p < 0.01$ ) were associated to a lower incidence of long-term SA at the two-year follow-up (see Table 3, study III). No statistical associations were detected between the use of individual-directed WHP measures and incidence of long-term SA in 2011.

In a multivariate analysis, associations were detected between individual-directed WHP measures provided in year 2007 and incidence of long-term SA in year 2009. The mean proportion of employees who had used health profile assessment/fitness test and fitness activities together explained 8.1% of the variation in incidence of long-term SA. Use of fitness activities was significantly related to lower incidence of SA. When use of an employee questionnaire was included in the analysis, only the employee questionnaire was significantly related to lower incidence of long-term SA. The model explained 13.6 % of the variation in long-term SA. When incidence of long-term SA in year 2007, the number of inhabitants in year 2009, and the level of unemployment and income in year 2010 were controlled for, none of the individual-directed WHP measures were significantly related to long-term SA in 2009. There were still, however, indications of associations between fitness activities and employee questionnaire and lower incidence of long-term SA ( $p \leq 0.122-0.139$ ) (see Table 4, study III).

##### **4.4.2 Organizational-directed measures**

In the bivariate analyses in study I no organizational-directed WHP measures (i.e., psychosocial work environment factors) were related to SA (mean number of days with sickness cash benefit (>14 days)). In the SEM analysis, however, stepwise indirect associations were found, via employee SRH, between more favorable psychosocial work environment factors (see 4.3.3) and lower SA (mean number of days with sickness cash benefit (>14 days)) (see Figure 1, study I).

Likewise, at the four-year follow-up an association was found between provision of prevention programs and lower incidence of long-term SA ( $R^2=6.2\%$ ), remaining after adjustments (see Table 5, study III).

#### **4.5 WORKPLACE HEALTH PROMOTION (WHP) AND EMPLOYEE SICKNESS PRESENCE (SP) – INDIVIDUAL LEVEL ANALYSES**

##### **4.5.1 Individual-directed measures**

In study IV bivariate associations were found between lower SP and health profile assessment/fitness testing (Spearman corr  $-0.037$ ,  $p<0.01$ ) and fitness activities (Spearman corr  $-0.035$ ,  $p<0.01$ ) (see Table 3, study IV).

Further, in the multinomial logistic regression analysis in study IV, there were significant associations between SP and individual-directed WHP measures, when included in the same model, controlling for age and educational level. Those employees who used health profile assessment had a lower OR of medium SP (OR=0.811; CI=0.681-0.966), compared to those who were not offered this measure (no significant associations with high SP). Those employees who used fitness activities had a lower OR of high SP (OR=0.760; CI=0.642-0.900), compared to those who were not offered this measure. In all the analyses, younger employees had a higher OR than older employees for being SP (both medium and high) (see Table 4, study IV).

## 5 DISCUSSION

### 5.1 GENERAL DISCUSSION

The overall aim of this thesis was to investigate associations between individual and organizational WHP approaches and SRH (study I and II), SA (study I and III), and SP (study IV). The results showed low or moderate associations between provision and the use of WHP measures, both individual-directed and organizational-directed, and better SRH (organizational level), lower SA levels (organizational level), and lower SP (individual level) (Figure 2).

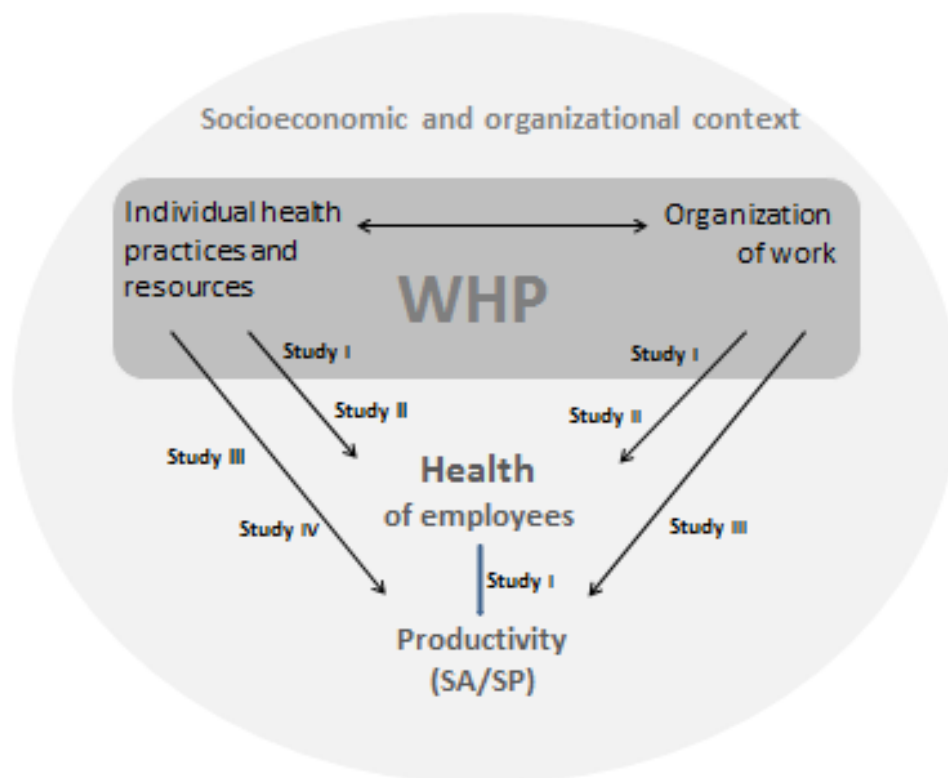


Figure 2. Hypothesis of associations between WHP and employee health and productivity. A model modified from Shain & Kramer (2004), complemented with the results of the present studies.

#### 5.1.1 Individual-directed WHP measures

The results of this thesis revealed associations between an index of aggregated employee-reported use of eight individual-directed WHP measures and better SRH (Figure 2). Further, the results showed associations between an index of top manager-reported provisions of health profile assessment and fitness tests and fitness activities and medical health control and better SRH among the employees (Figure 2). There were indications of associations between aggregated employee-reported use of fitness activities and employee questionnaires and lower incidence of future long-term SA (Figure 2). Associations were identified between employee-reported use of health profile assessment and fitness activities and lower level of

self-reported SP (Figure 2). In other words, of all eight individual-directed WHP measures, fitness activities was the only measure that was associated or showed indications of association with all three aspects of health (SRH, future SA, and SP).

Fitness activities were the most common measure provided, according to reports from both the employees' (around 50% of the employees had been offered it) and the employers' (85% of the organizations offered it). In previous research about individual-directed WHP measures and employee health outcomes, many studies have been performed in the areas of physical activity and nutrition. Several reviews were performed about physical activity and its effectiveness in relation to different outcomes; some of them support the results in this thesis and some do not. The results are inconsistent, since no associations have been suggested both between fitness activities and lower SA (van Dongen, et al. 2011; Odeen, et al. 2013) and associations between fitness activities promoting healthy life style and higher wellbeing or lower SA (Kuoppala, Lamminpää & Husman, 2008). Some reviews showed limited support for fitness activities in reducing SA (Amlani & Munir, 2014) and in improving health (Conn, et al. 2009). There are also reviews investigating the effectiveness of workplace physical activity interventions in improving physical activity behavior that showed positive effects (To, et al. 2013), but also some that showed inconclusive results (Malik, Blake & Suggs, 2014). Reviews of the effectiveness of worksite programs of nutrition and physical activity in promotion of healthy weight among employees found modest improvements (Anderson, et al. 2009). According to the results of a systematic review, the evidence is increasing on the role of physical activity interventions in improving physical activity behavior (Dugdill, et al. 2008). These results indicate that studies within this area would also benefit from investigations of stepwise associations between fitness activities and employee health/SA, via employee behavior. There are intervention studies supporting our results regarding fitness activities and health. Interventions of fitness activities and reduced work hours showed associations between fitness activities and decreased SA (Thiele Schwarz & Hasson, 2011). Workplace intervention programs targeting weight reduction (fitness activities was one component) showed improvements of employee health in terms of weight reduction (Carpenter, et al. 2014; Davis, et al. 2014; Thorndike, et al. 2012), blood pressure (Davis, et al. 2014), and improvements in diet and exercise behavior after one year (Thorndike, et al. 2012). An intervention study of a multidimensional program consisting of the measures of physical training, patient transfer techniques, and stress management and personal development and of SA showed no sustained association (Svensson, et al. 2011).

The results of this thesis must be interpreted with caution, since cross-sectional data and previous studies show inconsistent results. (There was an exception for study III, but the associations were not significant when control variables were included). However, the results of this thesis support the idea that individual-directed measures can make important contributions to employee health. The results reveal that around half of the employees who are offered fitness activities use it. According to previous research and the results of this thesis, promotion of fitness activities among employees seems to be motivated. The need for studies about individual-directed WHP measures, specifically in the social care sector, have been emphasized as well (Chan & Perry, 2012). This is a strength with the present study because of the relatively high SA levels in this sector in Sweden.

The results of the study indicated that the employees who had used health profile assessment and fitness activities had a somewhat but significantly lower risk of being SP. Previous research about SP and associations to WHP are limited and inconsistent, with some studies showing no associations between individual-directed WHP measures and SP (Bustillos & Trigos, 2013; Christensen, et al. 2013) and some revealing associations between individual-directed WHP measures and SP (Edmunds, Stehpenon & Clow, 2012; Merrill, et al. 2012). The study by Christensen and colleagues (2013) showed no associations after 12 months, however a short-term effect after three months, between intervention and SP. This supports the thought that individual-directed WHP measures may have a short-term effect compared to the longer-term effect of organizational-directed WHP measures. Some previous studies support the results of study IV. However, the study by Merrill and colleagues (2012), which is also cross-sectional, showed that the association might be the other way around, in other words, that employees who have a lower risk of high SP are more likely to utilize fitness activities. Moreover, the results for the study are also supported by prospective findings (Edmunds, Stehpenon & Clow, 2012). The identified association between use of health profile assessments and lower SP might be explained by the assessed employees having had their health monitored, which may indicate health risks and potentially motivate a behavioral change. Once again, it might be the other way around, in other words, that mainly the employees at a lower risk of SP used this WHP measure. Because of the scarcity of previous studies, the results of study IV, although cross-sectional, contribute knowledge both in terms of identified associations between individual-directed WHP measures and lower SP and in terms of showing these association for a large sample of employees (n=8082).

### **5.1.2 Organizational-directed WHP measures**

The organizational-directed WHP measures examined in this thesis were investigated in terms of aggregated employee ratings of psychosocial work environment factors (i.e., leadership, social climate, role conflict, and team appreciation) and of measures (i.e., local WHP projects and WHP coordinators). One study has identified certain strategies and procedures related to leadership, employee development and participation, and employee health as being characteristic of organizations with low SA (Stoetzer, et al. 2014). This is in line with the associations identified in study I between beneficial psychosocial work environment factors and better SRH and lower SA at the organizational level (Figure 2). The results in this thesis revealed indirect associations between leadership and employee health, which is in line with previous research (Bronkhorst, et al. 2014). The associations between leadership and SRH in study I were mediated through aspects of role conflicts, social climate, and team appreciation. A supportive leadership style was associated with a lower level of role conflicts, which in turn was related to a better social climate, which was associated to higher team appreciation, which was associated to higher levels of SRH. These results are in line with previous research within health care work that links unsupportive management style and/or low quality of management and role conflicts to poor health (Michie & Williams, 2003; Dellve, Lagerström & Hagberg, 2003; Lund, et al. 2005; Rugulies, et al. 2007). Positive employee ratings of a manager's leadership styles regarding developmental aspects corresponding to the concept of "developmental leadership" (Rafferty & Griffin, 2006) (i.e., receive appreciation for work achievements, receive encouragement for participation and receive help to develop skills) were indirectly associated with better employee SRH and



lower SA. This is supported by the results of previous research linking initiatives of “healthy workplace practices” (e.g., employee growth and development, recognition and employee involvement) both directly and indirectly to decreasing levels of absenteeism (Grawitch, Gottschalk & Munz, 2006). This association is also supported by the findings of Holmgren, Hensing and Dellve (2010) (i.e., associations between having a supervisor considering one’s views) and lower SA. Likewise, employee participation in decision making has been found to be associated with more positive health levels (Dellve, Skagert & Vilhelmsson, 2007; Nyberg, Bernin & Theorell, 2005). One study within health care identified psychosocial factors as even more important than patient-related factors for employee stress (Testad, et al. 2010). The results in study I also revealed indirect associations between supportive leadership and better SRH and lower SA, which is supported by a prospective study identifying associations between low supportive leadership and higher long-term SA (Agestad, et al. 2014). Additionally, study I revealed indirect associations between a lower presence of role conflicts and better employee SRH and lower SA. Previous research about role conflicts in relation to health is more limited than for instance research about leadership and health. However, the results in study I received support from previous prospective studies revealing associations between role conflicts and SA (Lund, et al. 2005; Agestad, et al. 2014). As in many occupations, social care can be demanding because of, for example, shortages of resources and incompatible requests from relatives, colleagues, employers, and the media. The results in study I also showed indirect associations between a better social climate via team appreciation and better employee SRH and lower SA. This is in line with previous identified associations between aspects of social climate and SA (Piirainen, Räsänen & Kivimäki, 2003; Vaananen, et al. 2004; Gonzalez-Roma, et al. 2005; Holmgren, Hensing & Dellve, 2010; Karlsson, Björklund & Jensen, 2010) and between aspects of social climate and health (Bronkhorst, et al. 2014).

The value of studies investigating indirect associations regarding psychosocial work environment factors and different outcomes has been emphasized (Kelloway, Teed & Kelley, 2008). This is, accordingly, a strength of study I since it investigated indirect associations between psychosocial work environment factors and SRH and SA. The stepwise associations between leadership, team appreciation, and health and SA are in line with previous findings (Lohela Karlsson, Björklund & Jensen, 2010; Nielsen, et al. 2008; 2009). Additionally, the results of study I show that leadership is not only mediated through social climate to SRH but also to SA. Accordingly, research about the psychosocial work environment and SRH and SA could benefit from consideration of indirect associations. What are the mechanisms explaining associations between psychosocial work environment factors and employee SRH and SA? The results of intervention studies targeting psychosocial work environment factors, often in relation to stress reduction are inconsistent, since both no/weak effects (Briner & Reynolds, 1999; Taris, et al. 2003) and beneficial effects (Bambra, et al. 2009; Orth-Gomér, et al. 1994) were suggested. A lot is known about environmental factors that lead to stress, but the need for more knowledge about organizational interventions, also with a more positive focus, have been highlighted (Kelloway, Teed & Kelley, 2008). Although not intervention studies, studies II and III are attempts to contribute with knowledge about the prevalence of organizational-directed WHP measures in the 60 organizations investigated and about associations to SRH and future long-term SA at the organizational level.

The results in study II revealed that individual-directed WHP measures were more commonly offered than were organizational-directed WHP measures. This is in line with reviews about work-health interventions (ENWHP, 1999; Harden, et al. 1999; Giga, et al. 2003; Caulfield, et al. 2004; Della, et al. 2008; Torp, Eklund & Thorpenberg, 2011), as well as a study of the prevalence of WHP (Ulmer & Groeben, 2005). One study, however, found the opposite (Plath, et al. 2008). The results of study II also showed associations between an index of top manager-reported measures regarding local WHP projects and WHP coordinators and better levels of aggregated employee SRH (Figure 2). No previous research regarding local WHP projects and WHP coordinators in relation to SRH were found, which indicates that our results make an important contribution. There is, however, previous research showing a positive association between the presence of a staff person for WHP and provision of comprehensive WHP programs (Linnan, et al. 2008). This study indicated that having a WHP coordinator might lead to higher WHP activity, meaning that the association in study II between a WHP coordinator, a local WHP project, and better SRH could also be explained by other WHP activities or more active WHP work in general. This thought is supported by an association identified between systematic occupational health and safety management activities and a better physical and psychosocial work environment (Torp, Riise & Moen, 2000) and improved support from management and colleagues (Torp & Moen, 2006) (i.e., additional effects are possible). Study III revealed associations between policy-maker-reported measures regarding provision of prevention programs and lower future levels of long-term SA (Figure 2). These results are in line with a previous study (Dellve, Skagert & Eklöf, 2008) that revealed associations between well-structured systematic occupational health and safety management and lower SA. The study emphasized the importance of structure for managing work environment issues. Might it be that organizations are more structured in systematic occupational health and safety management are also more active in WHP (i.e., more likely to even take non-statutory approaches)? Is perhaps a well-structured systematic occupational health and safety management a prerequisite for WHP? Future research on the prevalence of, prerequisites for, and synergistic effects of systematic occupational health and safety management and WHP is suggested. The results in study II also revealed associations between employee satisfaction with WHP and better SRH. These results add to the positive association identified in a previous study (Torp, Riise & Moen, 2000) between systematic occupational health and safety management activities and employee satisfaction with systematic occupational health and safety management.

### **5.1.3 Comprehensive approach**

A comprehensive approach to WHP is advocated in the literature (Chu, et al. 2000; Noblet & LaMontagne, 2006; Shain & Kramer, 2004; ENWHP, 2007; Goldgruber & Ahrens, 2010; Montano, Hoven & Siegrist, 2014; Pelletier, 2011; Pronk, 2009). As stated in the introduction, I regard a comprehensive approach as being a broad provision of individual-directed and organizational-directed WHP measures. In study III, associations were revealed between organizational-directed WHP measures (i.e., prevention program) and a lower incidence of long-term SA four years later. Additionally, associations between individual-directed WHP measures and a lower incidence of long-term SA two years later were indicated. However, in study III the two types of interventions were not simultaneously investigated in relation to SA; yet, it might be that the prevention program in itself contained

a more comprehensive approach. I do not know with certainty what the policy-makers referred to when they answered this question. My interpretation of a prevention program is that it includes organizational-directed measures, since the question asked, “Over the past 30 years, a number of reform initiatives have been introduced by local governments in Sweden. Which organizational reforms are present in your municipality today or were present in the past?” However, perhaps prevention programs tend to contain *both* individual-directed and organizational-directed measures (e.g., physical activity, prevention policies). In studies I and II, individual-directed as well as organizational-directed WHP measures were simultaneously investigated in relation to SRH/SA, and the results support the idea of a comprehensive approach. The reasons are twofold: 1) both psychosocial work environment factors and an index of individual-directed WHP measures were associated with better SRH and lower SA (Figure 1, studies I, and II) both an index of organizational-directed and an index of individual-directed WHP measures were associated in the same analysis to better SRH (study II) (Figure 2). These results regarding comprehensive approaches are not only in line with previous theoretical papers and reviews, but are also supported by some intervention studies (Bertera, 1990; Flannery, Resnick & McMullen, 2012). Between 1990 and 2005, application of a comprehensive approach within job stress interventions has been more common (LaMontagne, et al.2007).

To sum up, in regard to individual-directed WHP measures the following were all associated with more beneficial health outcomes: an index of utilization of eight individual-directed WHP measures, an index of health profile assessment/fitness test (although associated with higher SA levels in study III), fitness activities and medical health control, the single individual-directed WHP measures of health profile assessment, fitness activities, and employee questionnaire. In regarding to organizational-directed WHP measures, the following were all associated with more beneficial health outcomes: psychosocial work environment factors, an index of provision of local WHP projects and WHP coordinators, and provision of prevention program. Based on the results included in this thesis, the possibilities of drawing causal conclusions are limited. In regard to WHP and SP, significant associations were only identified for the WHP category “offered and utilized” and SP. This might be an indication for employers that it is not enough for them to provide individual-directed WHP measures, but that they also need to encourage use of the measures. Significant associations were found in the studies of WHP and incidence of future long-term SA and of WHP and SRH, which only incorporated the category “offered and utilized.” Although my hypothesis is that WHP measures, both individual-directed and organizational-directed could make a positive contribution to employee health aspects, there might be other explanations as well. First, it might be that the employees who used these measures are healthy and would be using fitness activities even if they were not offered by the employer. Second, the organizations who offered these types of measures might be more likely to have strict policies regarding both recruitment and pensions. A previous study (Stoetzer, et al. 2014) found that organizations with low SA preferred to use systems to monitor and follow-up employees on sick-leave and wanted to give employees opportunity to work when ill through adaptation of work tasks.

## 5.2 METHODOLOGICAL CONSIDERATIONS

The studies included had both strengths and limitations. The strengths are the large number of municipalities and employees included, the high quality of register data on SA, the data from different structural levels, the wide range of variables included in the analyses, data collected from different sources, all employees being covered by the same insurance policy, and the high response rates in the questionnaire for senior managers in study II. Another strength is the female-dominated choice of study group, since more knowledge is needed about organizational factors and health particular within female low-status occupations (Dellve, et al. 2006). Strengths of studies II and III are that they include information on organizations and their employees. This is in line with Kalleberg (1994), who argued 20 years ago that data regarding characteristics of work organizations should be collected from key informants (e.g., managers), in order to be reliable. He also emphasized the increasingly recognized need for data sets that include information on organizations and their employees. Studies II and III contribute to the strength of the paper because they used multiple informants, which helps minimize the problem of workers' lack of knowledge about organization-level information vice versa (Kmec, 2003). Kmec (2003) also points to the need of selecting an employer informant who is responsible for policies and decisions, which was done in study II (employer representatives) and III (several people in a leading position). Another strength of all the studies is that they include data collected from employees in these municipalities, which contributes to the elucidation of the questions from another perspective. A strength with studies I–III is the use of data from different sources, since it means avoidance of common method bias because exposure and outcome variables are based on different types of measurements, in accordance with Podsakoff and coauthors (2003). No multilevel analysis was conducted because the focus was the organizational level (i.e., factors we have no reason to believe differ at the individual level). If we had studied, for example, employee weight or political opinion as possible explanations for municipal differences in SA, conducting multilevel analyses would be justified. The risk of ecological fallacy, meaning drawing conclusions on individual level when the analyses are performed at organizational level (McLaren & Hawe, 2005) should be avoided. Since the focus of interest is the organizations and differences between them, this is not regarded a major problem; however, when interpreting the results one should bear in mind that in studies I–III, the results are only interpretable at the organizational level.

One limitation is the response rate among the employees of around 50%. There were both object- and partial dropouts from the employee questionnaires. Partial dropouts can be explained by the respondent forgetting to answer one/some items, misunderstanding the instructions and answering wrong items, not understanding the question, or the question being experienced as too sensitive. Others reasons were double marks and unclear answers. The partial dropout was relatively low for most questions; however, the item regarding SP had a slightly higher partial dropout. This could be explained by the respondents answering alternatives that were not relevant, instead of answering “no”. Another limitation regards the organizations with a more active WHP because they might also have a stricter policy concerning employment and health aspects and which and how quickly employees on sick leave receive disability pension. In other words, the associations between WHP and better health/lower SA, might be explained by employees with a worse health are not employed to the same extent in these municipalities as in municipalities with a lower WHP activity.

Research about WHP in relation to health/SA, is complex and needs to be targeted from different perspectives and with different designs and methods. Public health research questions are often multidimensional and the choice of study design should be driven by the actual research questions (Kavanagh, Daly & Jolley, 2002). The limitations of focusing on determinants of health and solutions solely on the individual level have been highlighted by Kavanagh, Daly and Jolley (2002), who also advocate the use of multiple methods within public health research. In three of the four studies included, a cross-sectional study design was used, meaning limitations of the studies since such designs do not allow for causal interpretations. However, as long as findings from cross-sectional, self-report assessments on psychosocial conditions are interpreted with caution due to the risk for subjectivity and common method variance, they have been argued to play an important role and to often be the first step in identifying risk exposures (i.e., in our studies regarding health promoting/preventing exposures) (Theorell & Hasselhorn, 2005).

Study IV was conducted at individual level and both exposure and outcome variables (except all control variables) were based on data from the same source (employee questionnaires). This should be kept in mind when interpreting the results. The implications could be important if, for instance, employees in a municipality are generally disgruntled with their employer for not, for example, offering WHP measures and not accepting absence due to sickness. This would lead to overestimation of the associations. However, the reverse could also occur, with employees being very satisfied with their employer, leading to underestimation of the associations. Since study IV concerns a less investigated research area, it is still valuable since indications for future research were detected.

The procedure, which involves first collecting data from organizations and thereafter from employees, is called “establishment-first method” (Kmec, 2003). However, in this study the choice of employees was done differently than usual. The employees were identified on a national basis independent of the employers as is usually done. The employees were randomly sampled by Statistics Sweden, which provided a great advantage because the study avoided the lack of reliance that occurs in the regular method when the employers are supposed to select the worker sample (Kmec, 2003). The questionnaire for top managers was developed for these studies with inspiration from a previous study (Dellve, Skagert & Eklöf, 2004; 2008). As stated, the items were reviewed by an expert group and pretested. However, further work is needed to improve the validity of these kind of measurements. The items about WHP in the employee questionnaire were developed for these studies as well. One question might be why the items were chosen as measures of individual-directed WHP measures. This is relevant because perhaps all items should not have been included. In particular, the items regarding employee questionnaires and work environment education might not be regarded as measures solely directed to individuals.

That the three biggest cities in Sweden, Stockholm, Gothenburg, and Malmö, were not included in the sample could be regarded as a limitation, but also as a strength because of the cities’ more complex organizations and internal diversity. Since the municipal/ organizational level was the focus of interest (study I-III), the data has not been weighted. Low response rates are a general trend (Statistic Sweden, 2011), and, unfortunately, this study was no exception. Nevertheless, the low employee response rate (just over 50 %) is a concern. One possible explanation was that workers were afraid to anger and/or expose their employer

(Kmec, 2003). We tried to prevent this by sending the questionnaire to the homes of the employees, so they could respond in private and by emphasizing that the answers would be treated confidentially. A dropout analysis revealed that men, younger employees, and employees living in suburban municipalities were less likely to answer. This should be kept in mind when interpreting the results and means the results are perhaps not representative for these groups or for the three biggest cities. The possibility of generalizing these results to national level is limited, since small municipalities are over-represented and large municipalities are under-represented in the sample. The variation in response rate between the municipalities, which ranges from 44.1-70.1%, should also be kept in mind. This is a weakness of the study, and if the dropouts systematically differ from those who had answered in a specific regard, it could lead to bias in terms of misleading proportions for some municipalities.

In year 2008, information on the explorative variables regarding WHP was collected from the employees and employers (n=60) for year 2007. However, at the time register data on the outcome variable SA for the employees (study I) was only available for year 2006, as the latest. However, correlations between the available register data regarding SA among all municipal employees from the years 2006, 2007, and 2008 show very high significant correlations ( $r=0.75-0.87$ ). This implies that SA data from the year 2006 can be used as a proxy for SA in the year 2008.

In studies I, III, and IV, employee use of individual-directed WHP measures were investigated, so it was a strength to have the employees as the respondents. There was a risk that the employees would report more use than is the case, but there was no reason to believe this risk differed between the individuals. This means the range in differences between the individuals regarding use of individual-directed WHP measures is still adequate. One might also think about the possibility that the employer representatives reported more or wrong WHP actions than was the case. As pointed out by Theorell and Hasselhorn (2005), expert assessments not only contribute with an objective element, they also introduce the subjectivity of the expert, which becomes another source of error. One strength with study III compared to study II is that the policy maker data in study III is based on a mean value of up to seven managers per municipality compared to one top manager in each municipality in study II. The respondents within each municipality work at different types of workplaces, for example, in specific sheltered accommodations or with home-based care, which means they might have different work and organizational conditions to refer to. However, since all the data (except in study IV) was aggregated to municipal/ organizational level, this aspect should be evenly “spread” over all organizations, which means there is no direct reason for bias.

## **6 CONCLUSIONS**

### **6.1 GENERAL CONCLUSIONS**

There were low or moderate associations between provisions of or use of workplace health promotion (WHP), for both individual and/or organizational approaches and lower levels of poor self-rated health, lower future incidence of long-term sickness absence, and lower odds ratio for sickness presence among employees in social service organizations.

### **6.2 SPECIFIC CONCLUSIONS**

At the organizational level, the use of WHP measures was associated with better employee health (study I).

At the organizational level, use of WHP measures was indirectly associated with lower sickness absence (>14 days) (study I).

At the organizational level, beneficial psychosocial work conditions were associated with better employee health (study I).

At the organizational level, beneficial psychosocial work conditions were indirectly associated with lower sickness absence (>14 days) (study I).

At the organizational level, individual-directed WHP measures were provided more often than organizational-directed WHP measures (study II).

At the organizational level, there was a positive association between employees' positive satisfaction with the WHP measures provided and better employee health (study II).

An index of the individual-directed WHP measures provided (e.g., health profile assessment, fitness activities and medical health control) and an index of organizational-directed WHP measures provided (e.g., local WHP project and WHP coordinator) were associated with better employee health (study II).

At the organizational level, there was a positive association between provision of organizational-directed WHP measures (e.g., prevention program, and lower long-term sickness absence (>90 days)) at the four-year follow-up (study III).

About half of the study group had been sickness present two times or more in the previous year (study IV).

The most common reasons for being sickness present were "cannot afford to be sickness absent" and "loyalty to colleagues who otherwise would have had to do my work tasks" (study IV).

There were associations between use of health profile assessment and fitness activities and lower odds ratio for sickness presence (study IV).

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## 9 APPENDIX

The following items from QPS Nordic are included in the SEM model (study I).

*Here are questions and assertions about your current work and your current workplace.*

- a) *Are your work achievements appreciated by your immediate superior?*
- b) *Does your immediate superior encourage you to participate in important decisions?*
- c) *Does your immediate superior help you develop your skills?*  
This item hereafter called “developmental leadership”

- d) *If needed, can you get support and help with your work from your immediate superior?*  
This item hereafter called “support from superior”

*What is the climate like in your work unit?*

- e) *Encouraging and supportive*
- f) *Relaxed and comfortable*  
This item hereafter called “social climate”

- g) *Do you appreciate belonging to this group or team?*  
This item is hereafter called “appreciate the team”

- h) *Do you have to do things that you feel should be done differently?*
- i) *Are you given assignments without adequate resources to complete them?*
- j) *Do you receive incompatible requests from two or more people?*  
This item hereafter called “role conflict”