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The Work Without Worry project: evaluation of a problem solving intervention program among health care employees
Chapter 5

5.1 Introduction

Worksite health promotion interventions to improve quality of work for health care employees can have important consequences for employees personally and the organizational structure. Application of these interventions are often challenging barriers for health care employees. In particular, employees working in health care centers for mentally disabled clients experience higher levels of burnout and less job satisfaction in comparison to other health care settings (Geurts et al., 1998; Paris & Hoge, 2009). To improve these health care employees' quality of work and eventually their well-being, the application of a theoretically based intervention program, containing work conditions and organizational aspects is expected to be more effective (Van der Doef, 2000; Akerboom & Maes, 2006). One of the most influential models in occupational functioning, the Job Demand Control Support (JDCS) model, has concentrated on the impact of work conditions such as job demands, control, and social support on employees' physical and psychological health (Johnson & Hall, 1988; Johnson et al., 1989; Karasek, 1979; 1985; Barnett & Brennan, 1995; De Jonge, Mulder, & Nijhuis, 1999; Johnson et al., 1995). Additionally, researchers examined the elimination of organizational risk factors as a primary strategy in order to prevent negative outcomes in an organization (Wagenaar et al., 1994). Besides the components for the content of an intervention program, the implementation approach appears to be of importance (Bourbonnais et al., 2006). A problem solving approach is investigated to gain insight into the implementation process in worksite health promotion programs directed at quality of work in health care organizations and well-being of health care employees. In a prior study, higher order goal facilitation through work of health care employees appears to have a positive influence on employee job satisfaction and well-being outcomes (Ter Doest et al., 2006).

In early worksite health promotion interventions, the focus was primarily on the physical safety of the employee (Maes & Van der Doef, 2004), followed by programs focusing on improvement of the health of employees by training them in individual stress management skills and promoting physical exercise. Upon this shift of focus from illness prevention to health promotion, the influence of working conditions on the health and well-being status of employees was acknowledged in worksite health promotion (Van der Doef & Maes, 1999a; Häusser et al., 2010). This resulted in worksite health promotion interventions focusing on improving quality of work. The most recent worksite intervention programs offer a combination of educational, organizational and environmental activities designed to enhance quality of work. However, these programs have not been performed in health care settings yet. A number of intervention studies among health care employees, including studies applying the well known JDCS model, have been executed, but the effects of the intervention programs differ a lot (Bourbonnais et al., 2006; LeBlanc et al., 2007;
Løkk & Arnetz, 2000; Mikkelsen et al., 2000; Petterson & Arnetz, 1998; Petterson, Donnersvard, Lagerstrom, & Toomingas, 2006; Tveito & Eriksen, 2008), despite the connection between work conditions and well-being outcomes (Van der Doef, 1999a; 2000, De Rijk, Le Blanc, Schaufeli, & De Jonge, 1998; Bakker et al., 2005; Demerouti et al., 2001; Johnson et al., 1995). This lack of consistency between intervention studies may be explained by the absence of a comprehensive theoretical framework to improve quality of work of health care employees. There appears to be no definitive answer as to what works, how and why. Additionally, the philosophy of just trying everything that is available in terms of intervention methods – ‘the more the better’ – is not supported by empirical evidence (Petterson & Arnetz, 1998; Petterson et al., 2006). A theoretically based intervention approach, focusing on the work characteristics of the JDCS model and the Tripod model, is expected to direct the intervention program. Moreover, to involve all employees of a health care center, the intervention approach has to be top down as well as bottom up. Besides the top-down/bottom-up issue, the intervention approach requires an individually and organizationally directed method, to involve all employees with different job roles in an organization. In order to understand the process of improving quality of work and well-being of health care employees, we suggest that a dynamic, problem solving intervention approach should be taken into account (Leventhal & Mora, 2005; D’Zurilla & Goldfried, 1971; Locke & Latham, 2002). A problem solving approach focuses on the goal directed and monitoring aspects of human behavior. Explanations for action are sought not in static personal tendencies, but rather in dynamic problem solving techniques like monitoring, feedback, control processes and (re)formulating goals. As such, a problem solving approach tends to involve employees into the intervention process and thus allows for the attainment of personal higher order goals, which might have a positive influence on their well-being (Ter Doest et al., 2006; Pomaki et al., 2004).

**Work conditions**

As mentioned earlier, the importance of the JDCS model in occupational research on employees’ well-being is well-known. In this model, a combination of job demands and control results in high strain jobs (high demands and low control) or low strain jobs (low demands and high control), and to active (high demands and high control) or passive jobs (low demands and low control) (Karasek, 1979; Van der Doef & Maes, 1998). The social support dimension results in isolated (with little opportunities for social interaction) or cooperative jobs (where interaction with colleagues is integrated) (Johnson, 1989; Karasek & Theorell, 1990; Van der Doef, 2000). A high strain job is hypothesized to result in high risk of psychological and physical illness, while active jobs are seen as precursors for increased motivation and learning. Van der Doef &
Maes (1998, 1999a) tested two hypotheses – the iso-strain hypothesis and the buffer hypothesis. The iso-strain hypothesis states that demands, control, and social support predict strain, while the buffer hypothesis posits that control and social support buffer the negative effects of demands on health. Research on these two hypotheses have found support for both arguments, and suggest that high demands are not unhealthy per se, because increased job control, in terms of decision authority and skill discretion, and social support at the workplace can moderate the impact of high demands on employees’ well-being (Johnson & Hall, 1988; Van der Doef & Maes, 1998; Bakker et al., 2005; Bakker, Demerouti, de Boer & Schaufeli, 2003; Bakker, Demerouti, & Verbeke, 2004; Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Johnson, et al., 1995; Daniels & Guppy, 1994; Barnett & Brennan, 1997).

Theorell (1996) states that the most important aspect between the three components is a balance: i.e. if demands increase, then control and/or social support should also increase to prevent a negative effect. Job demands, control and social support are important job conditions to take into account, when trying to increase job satisfaction and employee well-being. Van der Doef (2000) suggested also that other work factors, such as job insecurity and role ambiguity, are both important predictors of employees’ health and well-being. Boya et al. (2007) confirmed this finding for job insecurity and Pomaki et al. (2007) for role ambiguity. A common critique on the JDCS model is, that only a few aspects of the work environment are being examined and the JDCS model does not assign importance to the organizational context in which work tasks take place (Parker, et al., 2001).

Organizational risk factors
Although research examining the effects of organizational characteristics for health and well-being of care providers is limited (Akerboom & Maes, 2006), in addition to work conditions, a focus on the content of worksite health promotion intervention programs, organizational risk factors (e.g.: training possibilities and communication) have been known to promote not only health and well-being of employees, but also improved organizational performance (Jaffe, et al., 1995; Shoaf et al., 2004). Organizational characteristics considered in the current intervention project are derived from the Tripod accident causation model (Wagenaar et al., 1990; Wagenaar et al., 1994), in which contributing causes of accidents are traced back to ‘systemic errors’ in the way the organization functions. Barling and Zacharatos (2004) and Shoaf et al. (2004) suggest that determinants of organizational performance are likely to affect organizational safety and will affect employee health and well-being as well. Different studies based on the Tripod model have led to similar conclusions, suggesting that it is relevant to take organizational risk factors (ORFs) (e.g. training opportunities and communication) into account when constructing worksite intervention programs.
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(Schabracq, 2003; Frese & Zapf, 1994; Semmer et al., 1995). The Tripod model classifies deficiencies in working conditions, also known as latent failures, into eleven categories of inadequate organizational functioning. Five of the eleven failure types (staffing resources, communication, job skills, training opportunities and material resources) identified in the Tripod Delta predicted improved outcome measures like job satisfaction, emotional exhaustion, psychological distress and somatic complaints, next to the work conditions of the JDCS model (Akerboom & Maes, 2006). Apparently, two of these five organizational risk factors, communication and training opportunities, were of central importance to job satisfaction of the health care employees.

Despite these findings, the integration of organizational risk factors in intervention studies is limited (Gelsema et al., 2006). In addition, a sound theoretical framework to guide the development and implementation process of worksite interventions to improve quality of work and well-being appears to be missing. As we suggested earlier, a problem solving intervention approach may serve as a reliable method.

A problem solving intervention approach on quality of work and well-being

Intervention programs are often implemented by means of top-down processes (Brox & Frøystein, 2005; Cohen-Katz et al., 2005; Van Dierendonck et al., 1998; Gardner et al., 2005; Kuske et al., 2009; Tveito & Eriksen 2008), where the management specifies the problems within an organization and sets the goals for an intervention program to change the organizational structure, the employee’s behavior or both. In a problem solving approach, which gained attention in psychological theory (Locke & Latham, 2002; D’Zurilla & Goldfried, 1971; D’Zurilla et al., 2004; Watson & Tharp, 2006; Bandura, 1989; Emmons, 1986, 1989, 1997), not only the management but also the employees are involved in the intervention process. In this study, top down as well as bottom up processes are both taken into account (Petterson & Arnetz, 1998; Petterson et al., 2006; Lavoie et al., 2005; Bourbonnais et al., 2006). This problem solving approach is accomplished in regulative steps. After the problem orientation phase, the intervention targets have to be set by both the employees and the staff members. Therefore all employees participate in a quantitative screening procedure, including questionnaires about work conditions, organizational risk factors, and well-being outcomes. With the results of this screening process, the intervention goals are being set in an action plan and implemented in the organization together with a support team consisting of care employees and a human resource manager. During the implementation of the intervention program, the employees are involved in the process by feedback mechanisms, process evaluation and problem solving.
Prior research on a problem solving approach shows positive intervention effects at the workplace on social support and group coherence (Arneson & Ekberg, 2005; Mikkelsen et al., 2000), job demands (LeBlanc et al., 2007; Lokk & Arnetz, 2000; Mikkelsen et al., 2000), job satisfaction (Roberts et al., 1976), work related stress and role harmony (Mikkelsen et al., 2000). Besides these intervention effects, research on goal setting has demonstrated that both perceived characteristics of work-related goals (e.g., level of difficulty, congruence between individual and organizational goals) and other cognitions about work-related goals (e.g., commitment, goal-related self-efficacy) are related to a wide range of employee outcomes, including performance, satisfaction and well-being (see reviews by Locke & Latham, 1990, 2002). In that view, a problem solving approach, starting with a stage of goal setting, can thus be seen as a interesting intervention method for the health care organization to change problematic work conditions and organizational risk factors and to facilitate the attainment of higher order goals of their employees.

For that reason next to well-known positive and negative work related outcomes such as job satisfaction, emotional exhaustion, depersonalization and personal competence, it is also important to measure the degree to which important higher order goals can be facilitated by their work. In the current study we chose to evaluate the intervention effect on higher order goal facilitation through work of health care employees. It should be noted that these goals are indeed higher order goals or in other words important life goals. As such, these goals differ from work related goals. Furthermore, with respect to worksite health promotion, research in employee samples demonstrates links between personal higher order goal facilitation, work conditions and employee well-being. Pomaki et al. (2004) found that higher order goal facilitation was significantly related to Karasek’s work conditions and positively predicted employee well-being. In addition, Hyvönen, Feldt, Tolvanen & Kinnunen (2010) and Hyvönen et al. (2009) suggested that psychosocial work components contribute to the content of personal work goals, which also function as mediators, between the work environment and employee well-being. Likewise, Ter Doest et al. (2006) found that higher order goal facilitation through work accounted for substantial variance in job satisfaction and well-being outcomes even after controlling for the work conditions from Karasek’s model (1979; Karasek & Theorell, 1990). However, although the predictive value of higher order goal facilitation on well-being of employees has been reported in several studies, so far these associations have not been evaluated longitudinally or in worksite interventions.

In a problem solving intervention program in health care organizations, the management team as well as the employees assume a pro-active behavior rather than a passive role in the intervention program within the health care organization and,
based on the evidence of self-efficacy and self-determination (Locke & Latham, 2002; Gochman, 1997), obliges personal involvement and bottom-up processes more than ever. A problem solving approach can be identified as a goal guidance process which is part of organizational change and the attainment of personal and/or organizational goals. The most frequently examined change and maintenance mechanisms of a problem solving intervention program, include: 1) goal setting, 2) planning, 3) feedback mechanisms & control processes, and 4) progress evaluation.

Only a few evaluation studies are known that examined the effects of a problem solving intervention program at the workplace. Mikkelsen and his colleagues (2000) investigated the effects of a participatory intervention in health care settings in Norway on employees job demands, control, work stress and job satisfaction. They found that this type of organizational interventions can have long-terms effects on problem solving and employees satisfaction. LeBlanc and her colleagues (2007) studied the effectiveness of a team-based burnout intervention program for oncology care providers with a participatory action research approach and results showed positive effects on emotional exhaustion and depersonalization for the intervention group. Most worksite intervention studies focus on the effects of work conditions and ORFs on job satisfaction and health outcomes. The current study includes higher order goal facilitation as an important outcome of a problem solving intervention approach. The phases of the problem solving approach based on goal setting (Locke & Latham, 2002), self-regulation theory (according to Maes & Karoly, 2005) and problem solving (D’Zurilla & Goldfried, 1971) outline the structure of the theoretical framework used for the construction and implementation of the intervention project in the participating health care facilities in this study. Based on the results of the pre-test (T1), intervention goals were set by employees and management and problem solving techniques such as feedback, monitoring, control processes and reformulation of goals, were used to create and implement intervention programs for the experimental health care facilities.

Research questions
This study among health care employees aims to evaluate the effects of a problem solving approach to worksite health promotion and focuses on two research questions. Firstly, it is examined whether work conditions (skill discretion, decision authority, task control, work and time pressure, social support supervisor and co-workers, role ambiguity and job insecurity) and organizational risk factors (training opportunities and communication) improved after the intervention, compared to a control group. Secondly, it is investigated whether well-being outcomes (job satisfaction, higher order goal facilitation, emotional exhaustion, depersonalization and personal competence) of health care employees also improved significantly after the intervention. We
expected that a problem solving approach to work site health promotion programs would improve work conditions, organizational risk factors and well-being outcomes of health care employees. In the effect evaluation, we controlled for socio-demographic variables, such as kind of shift, years in sector and educational level. The need to control for these socio-demographic variables, when conducting research with health care employees, was confirmed by the differences that were found in the screening of the experimental and control health care centers on socio-demographic variables (see Appendix I). We did not control for the number of years in the health care center because this socio-demographic variable is highly correlated to years in the sector.

5.2 Method

Sample and procedure
In this study data was collected among health care employees in six health care centers for disabled people. At T1 3680 staff members of six health care centers were invited to participate and three experimental centers and three control centers were selected. On an at random base, the three experimental and three control health care centers were allocated to the experimental or the control group based on size and type of care, in order to create comparable groups. Out of this number, 1673 employees (45.5%) filled in the questionnaire. At T2 (three years after T1) 1466 of the 3626 staff members participated, which results in a response rate of 40.4%. Of the participants from T1 707 completed the questionnaire on the T2 (42.6%). Due to high turnover levels, about 15-20 % of the participants of the original sample could not be invited for T2.

The measurement procedure at T2 was the same as at T1 for the experimental health care centers (N=461) as well as the control group (N=246). Participation was on a voluntary basis and questionnaire identification codes were used. Only the researchers had access to the key relating the codes to individual employees. Furthermore, confidentiality of personal information was guaranteed. The measurements included the completion of a questionnaire.

The analyses in this chapter are based on the data of the 707 respondents, who completed the entire questionnaire at T1 and T2. We used one-tailed analyses instead of the two-tailed because the hypotheses are formulated in a specific direction.

Skewness has been calculated for all work conditions, ORFs and outcomes. From a traditional point of view (Morgan et al., 2004) in large samples as ours the criterion for normality is a skewness that falls within a range of -1.0 to +1.0. All variables fall within this range. As a consequence the requirements for univariate and multivariate analyses are not violated.
The majority of the sample is female (80.2%) and married or living together (4.3%). Most of the participants are in the age groups of 18 to 35 years old (42.1%) and 36 to 52 years old (53.7%). 31.3% of the participants were half-time employed (working 0 to 24 hours per week) and 59% worked 25 or more hours. Nearly half of the participants worked 0 to 5 years in this sector (48.9%) and 41.6% worked 0 to 5 years in this sector.

**Figure 5.1.** Flow chart
Chapter 5

Intervention
The intervention program applying a problem solving approach and extensively described in Chapter 4, started with the selection of the intervention goals, obtained from the screening procedure at T1. A support group, a steering group and a supervision group evaluated the intervention process on a regular base. The monitoring of the intervention programs was done by the steering and the support group, to be sure that conflicting or unrealistic goals could reformulated. The control group did not receive any intervention or supervision; the management only received the results of T1.

Measures
The respondents filled in a questionnaire which assessed: a) socio demographic variables, b) work conditions, c) organizational risk factors, d) facilitation of higher order goals, e) job satisfaction, and f) burnout.

a) Socio-demographic variables
Socio-demographic variables for this study are age, gender, kind of shift, years of employment, years working in this sector and educational level. The experimental group and control group were compared to each other on these variables and based on these results (see Appendix I) kind of shift, years working in this sector and educational level were included in this study as control variables.

b) Work conditions
The work conditions were assessed by the Leiden Quality of Work Questionnaire (LQWQ; Maes & Karoly, 2005; Van der Doef & Maes, 1999b). All items are phrased as statements with four answering categories (1=disagree completely, 2=disagree, 3=agree, and 4=agree completely). The factor structure of the questionnaire was assessed and cross-validated in two sub-samples of 2000 men and women from a large sample of the Dutch working population (Van der Doef & Maes, 1999b). Confirmatory factor analyses on a large sample of the Dutch population (N=10,112) indicated that the questionnaire measures eleven job conditions and the outcome variable of job satisfaction with a satisfactory reliability (Cronbach’s alpha ranging from .73 to .93) (van der Doef & Maes, 1999b). For the interpretation: a high score on a subscale is positive for the subscales skill discretion, decision authority, task control, social support supervisor and co-workers. A low score is positive for the subscales: work and time pressure, role ambiguity, physical exertion, hazardous exposure and job insecurity. The LQWQ assesses the three key concepts of the Karasek model; job demands, control, and social support with the following scales:
• Job demands are assessed by work and time pressure (α=.73; 4 items; e.g., “My job requires working very fast”).
• Control is measured through decision authority (α=.74; 4 items; e.g., “I have a lot to say about what happens on my job”), skill discretion (α=.76; 8 items; e.g., “I get to do a variety of different things on my job”) and task control (α=.73; 4 items; e.g., “I can determine my work pace”)
• Social support is measured with the scales social support from supervisor (α=.89; 6 items; e.g., “My supervisor cares about our concerns”) and social support from co-workers (α=.82; 6 items; e.g., “I feel appreciated by my colleagues”)

Other work conditions included in this study were role ambiguity (α=.75; 6 items; e.g.: “I know exactly which are my tasks”) and job insecurity (α=.75; 3 items: e.g.: “I expect to lose my job within the next five years”).

c) Organizational Risk Factors
The Organizational Risk Factors are measured with the Risk Factor Questionnaire, a tool consisting of 77 items, with three answer categories: Yes, No or Not applicable. For the interpretation counts that a low score on the subscales is positive. Half of the items were taken from the Tripod Delta Instrument. For the current study some of the items needed modification, in order to make them more specific and relevant to the work of health care employees. The remaining items were extracted from the Tripod Accident Investigation method (Akerboom & Maes, 2006). The two ORFs measured in this study are: communication (α=.82; 12 items; e.g.: “Did you receive incomplete and/or incorrect information”), and training opportunities (α=.77; 8 items; e.g.: “Did you have access to continued training and education”).

d) Higher Order Goal Facilitation
Higher order goal facilitation was measured with the workplace version of the goal facilitation inventory (GFI-W; Maes et al., 2005). The questionnaire consists of fifteen items representing work’s facilitation of higher order goals (α=.93; e.g.: “Keeping up my self confidence”, and “Receiving support from others”). Respondents answered the same question for each of 15 higher order goals: “To what extent can you achieve the following things through your work?” Answers were provided, separately for each goal, on a five-point scale (1= to a very limited extent; 5= to a very great extent).
e) **Job Satisfaction**

Job satisfaction was assessed with the job satisfaction scale of the LQWQ (\(\alpha=.84\); 6 items; e.g., “I am satisfied with my job”). Responses were given on a four-point rating scale, with higher scores indicating higher job satisfaction.

f) **Burnout**

Three burnout scales: emotional exhaustion, depersonalization and personal competence were measured with the UBOS-C (Schaufeli & Dierendonck, 2000), a validated Dutch version of the Maslach Burnout Inventory (MBI; Maslach et al., 1996) for health care employees. The UBOS-C consists of 22 statements, divided over three burnout dimensions: emotional exhaustion (\(\alpha=.76\); 8 items; “I feel exhausted because of my work”), depersonalization 5 items; (\(\alpha=.86\); 5 items; “I have the feeling that I treat some clients too impersonal”) and personal competence (\(\alpha=.77\); 7 items; “I have accomplished many valuable things at my job”). Items were scored on seven-point rating scales ranging from ‘1=never’ to ‘7=every day/always’.

**Data analyses**

The analyses were conducted with the SPSS 15.0 program. Mancovas and ancovas were used to compare the experimental health care centers to the control group. It was analyzed to which extent work conditions, organizational risk factors, job satisfaction, facilitation of higher order goals and the burnout dimensions emotional exhaustion, depersonalization and personal competence changed significantly between T1 and T2 (one-tailed test).

The representativeness of the employee sample at T2 (selective dropout) was analyzed by comparing the data (socio-demographic variables, work conditions, organizational risk factors and well-being outcomes) from the employees that completed the questionnaire at T1 but not at T2 (N=977) to the data from the employees that completed the questionnaire at T1 as well as T2 (N=707). Chi-square tests and t-tests were used to perform the analyses. The socio demographic variables (gender, age, marital status, years in sector, years in health care center, work hours per week, kind of shift and highest educational level) of the employees of the experimental group (N=461) and the control group (N=246) were compared at T1. Chi-square tests were used to perform the analyses.

5.3 **Results**

**Representativeness of the sample**

The research sample that participated at both T1 and T2 (N=707; research group) was not representative compared to sample that participated only at T1 (N=977;
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drop-out group) for several variables (see Appendix II). In the research group the employees were older (higher percentage in age group 36-52 years; 53.7% vs. 40.0%) and a higher percentage was married (74.3% vs. 69.5%) than in the drop-out group. Furthermore, more employees in the research group worked as care staff (34.2% vs. 25.2%) and more employees worked 6-10 years, thus a longer period of time, in the current sector (27.0% vs. 21.0%) and current health care center (27.2% vs. 21.9%). The employees from the research group worked more hours per week (work more often 13 to 24 hours per week; 31.1% vs. 26.7%) and more day shifts (40.0% vs. 31.7%) compared to the drop-out group. Concerning the work conditions, the employees in the research group experienced more decision authority (mean: 3.03 vs. 2.95) and more social support from their supervisor (mean: 2.86 vs. 2.79) and they had higher scores on the well-being outcomes higher order goal facilitation (mean: 10.02 vs. 9.89), job satisfaction (mean: 2.90 vs. 2.81) and personal competence (mean: 5.12 vs. 5.07).

Socio-demographics
In terms of the demographic aspects of the sample that participated at T1 and T2, several significant differences on the socio-demographic variables between the control group and the experimental group were found (see Appendix I). In the experimental group more employees work 6-10 years, thus a longer period of time, in the current sector (29.1% vs. 23.3%) and the current health care center (29.7% vs. 22.4%). Furthermore, in the experimental health care centers employees were lower educated (secondary vocational: 47.1% vs. 37.8%;) and work more flexible shifts (63.3% vs. 52.0%) than in the control group. On the basis of these findings ‘kind of shift’, ‘years in sector’ and ‘educational level’ were included in the analyses as control variables.

Multivariate and univariate effects of the variables in the study
Pearson correlations are used to test the univariate relationships between the variables in this study (table 5.1a and 5.1b). The correlations between the scales indicate that the relation between most factors are moderate to weak (r<.5). This is in line with previous correlation studies including quality of work and well-being (Van der Doef & Maes, 1999a; Akerboom & Maes, 2006) and shows that the different scales measure separate concepts. Means and standard deviation for the variables used in the analyses are displayed in tables 5.2, and 5.3. In addition, table 5.2 presents the results of the multivariate and univariate analyses.
### Table 5.1a

Intercorrelations between work conditions, ORFs en well-being outcomes within T1 (N=1684).

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*** p<.001; ** p<.01; * p<.05; (two-tailed)
### Table 5.1b. Intercorrelations between work conditions, ORFs en well-being outcomes within T2 (N=1460).

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*** p<.001; ** p<.01; * p<.05; (two-tailed)
Initially, in answer to the first research question, whether the work conditions and ORFs significantly improved after the intervention, the analyses show a significant multivariate effect on the dependent variables (work conditions and ORFs) among the experimental and the control group between T1 and T2 (p < .05, one-tailed). Univariate analyses demonstrate significantly positive effects for the work conditions skill discretion, decision authority and job insecurity and for the organizational risk factor training opportunities. However, a significant negative effect was found for the organizational risk factor communication.

Table 5.3 shows the effects between the experimental group and the control group on the well-being outcome variables between T1 and T2. Here, in answer to the second question whether the well-being of health care employees improved after the intervention compared to the control group, no significant multivariate main effect was found for the four outcome variables. Education was found to be a significant covariate. Furthermore, with univariate ancovas, no significant main effects were found. Education was a significant covariate for emotional exhaustion and education and kind of shift were significant covariates for personal competence.
### Table 5.2. Experimental group vs. control group. Work conditions and organizational risk factors: averages on pre-test and adjusted means for post-test and results. Manova and Ancova effects between the experimental and control group (F and p-values). Positive (+), negative (-) or non-significant (0) intervention effect at post-test. Correction for pre-test, years in sector, kind of shift, and educational level.

Employees participated in both T1 and T2.

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*p<.10, **p<.05, ***p<.01, ****p<.001, + = significant favorable intervention effect, - = significant unfavorable intervention effect, 0 = no significant intervention effect.
Table 5.3  Experimental vs. control group. Outcomes: Averages of pre-test and adjusted means of post-test and results. Mancova and ancova effects between the experimental and control group (F and p-values). Positive (+), negative (-) or non-significant (0) intervention effect at post-test. Correction for pre-test, years in sector, kind of shift, and educational level. Employees participated in both T1 and T2.

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<td>Exaustion T2</td>
<td>5.14</td>
<td>.63</td>
<td>5.17</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exaustion T2 adj</td>
<td>5.15</td>
<td>.03</td>
<td>5.15</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, + = significant positive effect, - = significant negative effect, 0 = non significant effect.

5.4 Discussion
The current study evaluates whether a problem solving approach to a worksite health promotion program among health care employees is effective in improving work conditions, organizational risk factors and well-being outcomes in health care employees. In line with our expectations, the first research question was partly supported. For the health care employees in the experimental group the work conditions skill discretion, decision authority and job insecurity and the organizational risk factor training opportunities, significantly improved after the intervention program, compared to the control group.

Apparently, these findings suggest that interventions with a problem solving approach lead to increased opportunity for health care employees to acquire better job skills obtained by the intervention program. Moreover, there is a beneficial effect on perceptions of the control and job security. We might conclude that the new
organizational structure in the experimental health care centers with more procedures at the one hand and more openness and a coaching leadership style at the other hand improved the quality of work of the health care employees. In contrast, according to the results, communication was affected negatively in the experimental health care centers, compared to the control group. According to Akerboom & Maes (2006), communication is important to improve job satisfaction of health care employees. A possible explanation can be that at the start of the interventions, the focus was more on improving the procedures in the organizations and less on the social skills. Later on, when the training program started, the respondents became more aware that the new organizational structure required an increased communication between all levels of the organization. In any case, more research is needed to clarify the role of communication in work site health promotion interventions.

Several previous intervention studies attempted to change work conditions and organizational risk factors by means of top-down interventions (Brox & Frøystein, 2005; Katz-Cohen et al., 2005; Van Dierendonck et al., 1998; Gardner et al., 2005; Kuske et al., 2009; Tveito & Eriksen, 2008). Communication procedures and decision making about the intervention program were given only by the management of the health care organization. In the current study, a top-down as well as a bottom-up intervention approach was used, according to a problem solving approach. Because health care employees are more focused in giving care to their clients than giving information about work processes to their colleges and supervisors, it might take more time to improve the communication skills of the health care employees. Moreover, making decisions (which has improved already by the interventions) about which information has to be given and to whom might take more time and training of all health care employees in making clear procedures and require more social skills to improve the quality of the working environment.

The results do not support the second research question: well-being outcomes did not significantly improve at T2 in the experimental health care centers, compared to the control group. No effects were found on job satisfaction, higher order goal facilitation, emotional exhaustion, depersonalization and personal competence. This means that, although there were favorable effects on various work conditions (skill discretion, decision authority and job insecurity) and an organizational factor (training opportunities), these effects are not reflected in an increase in job satisfaction and well-being. Various explanations can be provided for these results. First of all, besides some beneficial effects on working conditions, a negative effect was found with regard to communication. As communication seems to be an important variable in this setting (Van Dierendonck et al., 1998; Kuske et al., 2009; Lee & Swanson Crockett, 1994), it is possible that this partly explains e.g the job satisfaction, the lack of effect on well-being outcomes.
Still apart from this, it is quite possible that statistically significant changes in predictors in relatively large populations are not sufficiently strong to cause desired effects on well-being outcomes.

Independent of these explanations, a third explanation may be the content of the intervention program. Because two of the activities of the program were more organizationally based and especially focused on division level of the participating health care centers, the individual focus was only in the personal training program for the care employees, while this training started later. In addition, it is likely that other (unknown) factors, have influenced the well-being of the health care employees during the intervention period, this is a common limitation in evaluation studies that are not done in an experimental setting, but in a real life setting (Pryce et al., 2006; Lokk & Arnetz, 2000; Petterson et al., 2006; Bourbonnais et al., 2006). Furthermore, well-being of employees is influenced by more than just quality of work factors, that were not included in the current study. For example ergonomical problems, support at home, budget cutting in health care organizations are also known factors that influence well-being of employees. Moreover this training program did not yet end at the evaluation moment (T2). Therefore it is possible that job satisfaction, higher order goal facilitation and burnout levels did not yet improve. Consequently, a third measurement moment one or two years after T2 could provide more insight in potential long term effects.

Limitations and practical implications

The present study has some limitations. A common bias in longitudinal research concerns the healthy worker effect: unhealthy workers are more likely to have quit their jobs at the second measure moment, hence the healthy workers are overrepresented in the sample of workers that responds at both times. The sample group at T2 was only representative for some of the socio demographic, dependent and independent variables (see Appendix II). In the research group the employees were older, worked more hours per week and worked a longer period in the sector than in the drop-out group. Besides, more employees in the research group worked as care staff, than in the drop out group and they experienced more decision authority, more social support from their supervisor, more higher order goal facilitation, more job satisfaction and more personal competence.

In addition, the experimental group and the control group also differ from each other on socio-demographic variables (for specific results see Appendix I). In the experimental group more employees work a longer period of time in the current sector and in the current health care center. Furthermore, in the experimental health care centers employees were lower educated and they work more flexible shifts than in the control group. In short we can conclude that the health care employees of
the experimental health care centers have more experience in their job, are more committed to their job and can profit more from a training intervention. This has implications for the generalizability of the results of this study, which means that the results can be biased in a more positive direction for the experimental health care centers.

Furthermore, the sample in this study consisted of employees working in health care centers for disabled people. These employees are mostly lower educated (mainly secondary vocational and lower; see Appendix I) than for example health care employees working in general hospitals (more college and university educated) in the Netherlands. It would be interesting to investigate, whether the effects, found in this study, correspond to the effects in a sample with health care employees of a general hospital, who may react very differently to a problem solving intervention approach.

*Implications for future research concern study design and intervention conditions.* First, our study had a two wave panel design with a time interval of three years, where the actual implementation of the intervention program for the care employees started just one year after T1. The choice of a time interval should be based on a structured intervention perspective, in which problematic goals have to be set and how the effects of work conditions changes and higher order goal facilitation on well-being outcomes evolves over time. Therefore, it is suggested that future studies explore the influence of changes in multiple waves with different time intervals, so that the time process underlying the mutual influence of work conditions and different well-being outcomes is further clarified.

Secondly, we found that a problem solving intervention approach significantly improves work conditions and training facilities of employees. However, there is no firm evidence that this top down/bottom up intervention is more effective, especially in terms of well-being outcomes than e.g. a top down approach. It is therefore suggested to compare different approaches in future research, implying that there should be different intervention conditions, next to the control condition.