

Chapter 9

Inducing a health-promoting change process within an organization: the effectiveness of a Large-Scale-Intervention on social capital, on openness and autonomous motivation towards health.

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Abstract

Objective: to examine the effectiveness of an organizational Large-Scale-Intervention (LSI) applied to induce a health-promoting organizational change process.

Methods: A quasi-experimental, “as treated” design was used. Regression analyses on data of employees of a Dutch dairy company ($n = 324$) were used to examine the effects on bonding social capital, openness and autonomous motivation towards health, and on employees’ lifestyle, health, vitality and sustainable employability. Also, the sensitivity of the intervention components were examined.

Results: Intervention effects were found for bonding social capital, openness towards health, smoking, healthy eating and sustainable employability. The effects were primarily attributable to the intervention’s dialogue component.

Conclusion: The change process initiated by the LSI contributed to a health-promotion social work-environment and to ownership towards health. The study confirms the relevance of collective change processes for health promotion.

Key words: social change process, social capital, self-regulation, lifestyle, vitality at work, sustainable employability.

Introduction

The work-setting is an important health-promoting context¹. Workplaces give access to large groups of people and enable multilevel interventions needed to address a multifactorial construct like health². Workplace health promotion (WHP), however, is often not as successful as intended, even despite thorough intervention developmental processes³. Complexity of implementation and difficulties with evaluation designs are frequently mentioned reasons for the sometimes disappointing results of WHP^{4,5}.

In the literature, WHP is understood as a complex innovation⁶, including both individual and organizational interventions. Individual interventions primarily target the individual employees and their health behaviors. By contrast, organizational interventions primarily target health-influencing organizational features such as leadership style, work processes and organizational culture⁷. To achieve more effective WHP, researchers increasingly argue to address both levels simultaneously⁸. Organizations, however, will be only interested in WHP if there is a clear business relevance⁹. WHP therefore should not only focus on health needs; the business implications should be clear as well. To optimally adjust to the organizational needs and to achieve successful WHP, the use of organizational science and practical experiences are recommended^{1,10}.

In this study, organizational change theories and WHP knowledge were combined to develop an organizational health-promotion intervention aimed at inducing a health-promoting change process. We hypothesized that an organizational health-promotion social change process would increase bonding social capital and openness towards health within the organization, and would also increase autonomous motivation towards a healthy lifestyle among employees. These outcomes, in turn, were expected to promote health and vitality among employees.

Focus of the study and theoretical foundation

This study is based on a “whole population approach”¹¹, as contrasted by a “high risk approach”. A high risk approach seeks to identify and protect susceptible individuals. By contrast, a whole population approach attempts to shift the distribution of health towards better health in a whole population. From a business perspective, maintenance of the health

of the entire workforce represents a major business asset¹². A whole population approach is likely to contribute to the optimal functioning of large groups of employees. From a health perspective, a whole population approach seems useful as well. In times of a worldwide increase of lifestyle related ill health^{13,14}, a whole population approach may counteract the threat of increasing ill health in large groups of people. In the literature, a social change process is seen as one of the ways to work on a whole population approach. In addition, self-regulation in health is understood as important to achieve sustainable health of large groups of people¹⁶. Self-regulation refers to people as active agents, and is seen as a vital aspect of human adaptation to life¹⁷ with a main influence on health.¹⁸

The work-setting seems a particularly interesting context in which such self-regulatory social change process can be induced. Indeed, social interactions, work climate and organizational culture offer important intervention opportunities¹⁹. Possibly even more important, organizational *change and learning* theories, compiling knowledge on how to induce such self-regulatory social change processes, are available²⁰⁻²⁴. In these change theories, the organization's capacity to change particularly depends on the organization's skills and efforts to encourage employees to participate and "to shape the future together"²⁴. A social change process within organizations is primarily seen as a collective learning process^{22,24,25}, in which strategies such as substantive dialogue and seeking common ground processes are important elements. Inducing social change in organizations requires an active participation and concerns the mobilizing (groups) of people and facilitating employees to develop ownership towards the change.

In this field of organizational change and development, the concept of social capital is of particular interest. Social capital refers to: "*Features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit*"²⁶. In organizational science, social capital refers to mutual trust in relations, fostering cooperation and participation of every individual, and is presumed to make organizations more effective. Noteworthy to mention is that social capital has become an important research topic in health science as well. Organizational social capital comprises collaboration, trust and justice²⁷. In the literature, social capital is associated with both health²⁸⁻³¹, and with employees' functioning³²⁻³⁴. In particular, *bonding* social capital is ascribed a health-related effect^{35,36} and has meaningful business implications³⁷.

Organizational bonding social capital refers to mutual trust and cooperative relations between employees who are similar in terms of hierarchy and identity. Especially the active involvement of stakeholders and seeking for common ground that are central in organizational social change processes are presumed to increase trust and collaboration³⁸. Although active participation of employees in WHP has become more common, organizational change processes include a different approach than typically used in health promotion. Instead of participation of employees in the intervention developmental process, it involves a process in which the stakeholders shape the intervention themselves. It is an open process, rather than a participatory intervention development that will be implemented afterwards.

It seems sensible to investigate whether health interventions based on organizational social change theories may improve organizational social capital. In addition to social capital, openness towards a specific topic is indicated as an important factor for sustainable change within the system³⁸. It therefore also makes sense to investigate whether openness towards health will be promoted by an organizational health intervention based on organizational social change theories.

In addition, since organizational change theories include a self-regulatory process, it is interesting to investigate whether a health intervention based on organizational social change theories may improve self-regulation in health among employees. In health science, at the individual level, an autonomous motivational regulatory style towards a healthy lifestyle is understood as an important self-regulatory capability for sustainable health behavior³⁹⁻⁴¹. Autonomous motivation indicates the extent to which the behavior is in accordance with one's values and interests. It is interesting to examine whether an organizational health intervention based on organizational social change processes contributes to autonomous motivation towards a healthy lifestyle among employees.

Appropriate to the whole population approach, this study describes an organizational health intervention. Organizational social change theories were combined with WHP knowledge to develop, apply and evaluate an organizational health-promotion social change process. The aim of the study was twofold: a) to contribute to knowledge on how to induce a health-promotion change process within organizations, and: b) to examine its effectiveness on

bonding social capital, on openness towards health and on self-regulation in health among employees. Additionally, the effects on employees' lifestyle, health, vitality at work and sustainable employability were examined as well. As a derivative, by combining organizational change principles with health science, this study is also meant to contribute to more effective WHP.

The intervention

An organization-specific application of the Intervention Mapping protocol¹ was used to develop the intervention. IM is a stepwise, iterative approach to develop and evaluate health interventions in which all relevant stakeholders participate. Arising from this IM process, it was decided to apply the principles of a Large-Scale-Intervention (LSI)³⁸, with a focus on health and vitality at work. An LSI approach is defined as: *“A participative approach to organizing sustainable change with active participation of stakeholders from the entire system (organization or community and its surroundings)”*³⁸. The LSI approach originates from Systems Thinking²² and Action Research⁴²; it is used in complex dynamic change processes in which many stakeholders are involved. The equal participation of stakeholders is suggested to contribute to mutual trust and collaboration³⁸, which are two main aspects of organizational social capital²⁷. An LSI primarily intends to induce self-regulatory processes within communities on a specific topic. Self-management, action learning and looking for common ground among stakeholders are the main principles of this approach. In an LSI, a representative task group with all relevant stakeholders shapes the intervention process, appropriate to the needs within the organization. All relevant perspectives are therefore incorporated and used to give shape to the intervention. At regular intervals, the task group provides all people in the system the opportunity to actively give their input in the process. These inputs and decisions based thereof are fed back to the organization and used in the further process. Characteristic of an LSI is that intervention development and application are not separated, but are shaped and applied simultaneously by the stakeholders themselves.

In the dairy company, the task group consisted of representatives from every location (managers, HR representatives, employees), and two external experts in the field of occupational health and organizational change processes. During the intervention process, which lasted for 18 months, the task group met 11 times. They also used a shared network

community to exchange their experiences. The main aim of the task group was to shape the process by which the topics of health and vitality at work will be addressed and further embedded within the company. To connect the intervention with related issues in the company, the task group was linked to the overall management team, to local plant management teams, and to the HR and communication departments. Also, local task groups were formed to make the intervention more “location colored”; these met on average once every two months.

Intervention components

On the basis of the active participation of stakeholders within the organization, a more profound communication and dialogue on the value of health was requested. In addition, there was a need to support employees’ health and lifestyle by tangible health-promotion activities. The intervention components were as follows:

- 1) *Dialogue and reflective thinking on the (personal and organizational) value of health and vitality at work.* Support was given to departments on dialogue on the value of health and vitality at work into their regular meetings. Also, additional dialogue methodologies were offered, facilitated by the task group. An example is a “carousel meeting” in which diverse aspects of health and vitality at work were discussed in small groups of employees in a number of rounds. Participants were encouraged to reflect on the values they attach to health and vitality at work, and to define their personal health ambitions. At the end of these meetings, participants collaboratively determined the shared views and learning objectives, that subsequently were used in the task groups and management meetings to give further substance to this project.
- 2) *Collective vitality-promoting activities at department level.* The task group stimulated and organized physical activities at group level, such as lunchtime walking and active commuting to work. Also, workplace training for healthy work postures and a healthy work style were offered within work units. To stimulate healthy eating, the company provided fruit and healthy snacks for free. In addition, workshops on healthy dietary habits were available. These departmental intervention components were offered at times when the various work units requested it. Experiences with these activities were shared in the task group and utilized to give further substance to the project.

- 3) *Physical activities organized at the organizational level on which employees could participate individually.* The task group organized various physical activities, such as running and cycling races and team sports activities. Employees could participate on an individual basis or as a team. Participation in these activities were voluntary.

Methods

Participants and procedure

Participants were employees of a Dutch dairy company. The company was in a state of good business performance and the size of the company was growing. To optimally cope with changes, the organization defined a desired organizational culture with the following key principles: collaboration and active participation of all employees and self-organization. In line with this, the Health and Safety (H&S) policy was primarily targeted at promoting self-organization and increasing employees' intrinsic motivation towards H&S. The management team of this organization decided to cooperate in this present project, because they presumed the intervention would contribute to the desired organizational culture.

All employees of the company were asked to complete an online questionnaire at baseline and post-intervention. They were sent a letter or an email prior to baseline with a unique code allowing them to log onto a webpage. Only employees who were employed by this company at both waves and who completed both entire questionnaires were included in the analysis, which resulted in a data file with no missing data.

To adjust to the real-life situation in the organization, a quasi-experimental design was used. In real life it is not possible to control for all relevant influencing factors⁴³. Assignment of employees to the intervention or control group took place "as treated"^{44,45}. An as-treated analysis compares subjects based on the treatment that they have actually received. Since this intervention was primarily an organizational social change process which could not be entirely planned, it was not clear in advance who would be reached by the intervention. By using the as-treated principle, an intervention and a control group was made based on the intervention components that employees actually had received.

Group classification

Participants were classified into an Intervention Group (IG) or a Control Group (CG). Employees who had indicated that at least one of the components of the intervention applied to them were assigned to the IG; employees for whom none of the components applied were assigned to the CG. Additionally, to investigate the sensitivity of the different intervention components, the following subgroups were constructed based on the self-rated application of the different intervention components of the LSI:

- 1) Dialogue group (DG): employees who indicated that they actively participated in dialogue sessions about the value of health and vitality at work.
- 2) Collective vitality activities group (CVG): employees who indicated that collective vitality activities were actively performed in their departments.
- 3) Individual participation in physical activities group (IPG): employees who indicated that they had, on an individual basis, participated in physical activities that were organized at the organizational level.

Due to the pragmatic nature of the intervention, it was not possible to define mutually exclusive subgroups.

Figure 1 presents the flow of participants. All employees of the company ($n = 1,152$) were invited to complete the baseline questionnaire. The response rate at baseline was 54.6% ($n = 629$ employees). During the 18-month process, many job changes took place. Because several employees were not working for the company anymore, and others did not complete the entire questionnaire after the intervention process, 305 employees were excluded from the analyses after the second wave. Employees who had fully completed both questionnaires were included in the data analysis ($N = 324$). Of these 324 employees, 194 reported that at least one of the LSI components had been applied to them (IG), whereas 130 employees had not experienced any of the LSI components (CG). Divided in accordance with the intervention components, the DG consisted of 137 employees, the CVG of 148 employees and the IPG of 68 employees.

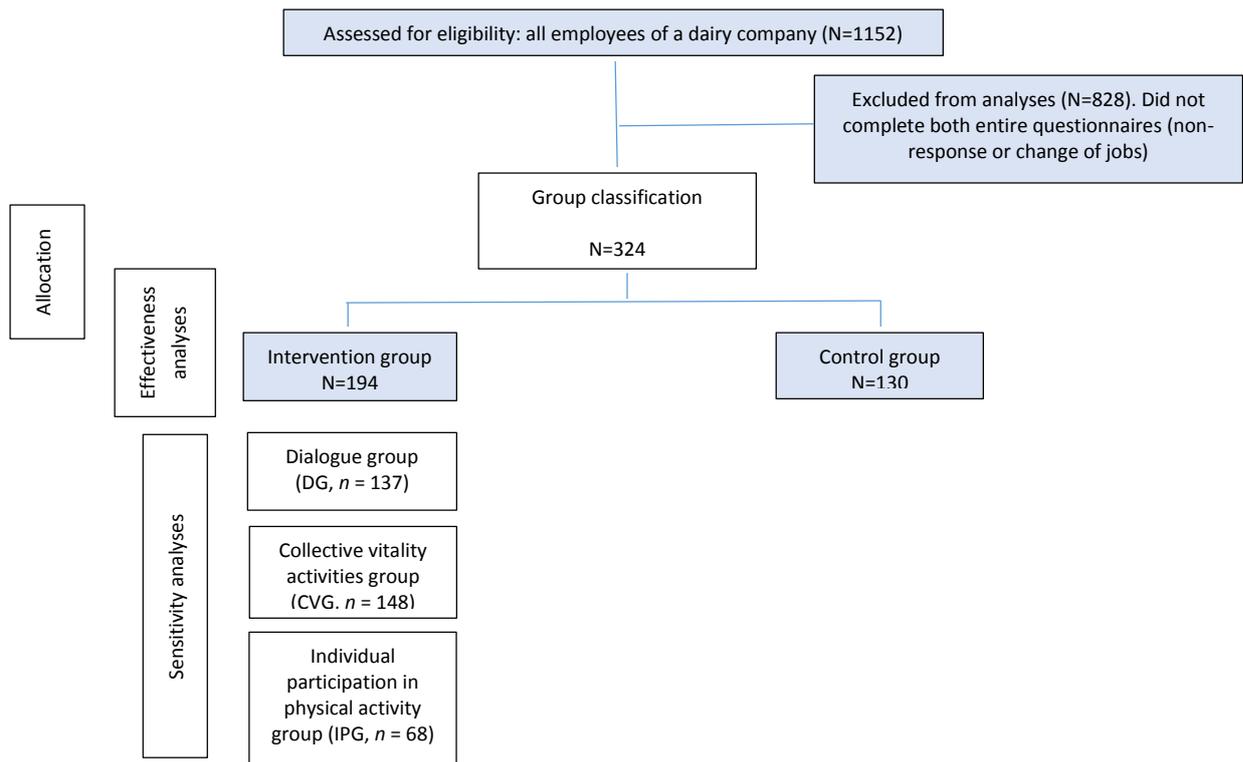


Figure 1. The participants flow

Measurements

The LSI was aimed at improving bonding social capital, openness towards health and vitality at work and autonomous regulation towards a healthy lifestyle among employees. Derived from these expected health-influencing outcome variables, an improvement of employees' lifestyle, health, vitality at work and of sustainable employability was expected.

Bonding social capital was assessed by a three item subscale of the social capital scale developed by Kouvonen et al.⁴⁶ using five-point Likert scales (1, totally disagree; 5, totally agree). An item example is as follows: "We have a 'we are together' attitude" (Cronbach α = 0.72).

Openness towards health and vitality at work was assessed by two items on five-point Likert scales (1, totally disagree; 5, totally agree): "I speak openly about my health and vitality with my colleagues", and "I speak openly about my health and vitality with my supervisor".

Autonomous motivation towards a healthy lifestyle was assessed by six items of a modified version of the Exercise Self-Regulation style Questionnaire (SRQ-E)⁴⁷. The SRQ-E was adapted to tap autonomous motivation towards a healthy lifestyle *in general*, instead of motivation

towards exercising. Employees were asked to indicate the extent to which several reasons for a healthy lifestyle applied to them (1, strongly disagree; 5, strongly agree). An item example is as follows: “Because it is fun and interesting” (Cronbach $\alpha = 0.82$).

Employees’ lifestyle

The level of *physical activity* was assessed by two items concerning the weekly level of moderate and vigorous physical activity in leisure time derived from the Dutch physical activity public health guidelines⁴⁸: “How many days a week do you spend at least 30 minutes doing moderate intensity physical activities, comparable to walking or cycling?” and, “How many days a week do you spend at least 20 minutes doing vigorous intensity physical exercise or sports which will make you sweat?”.

Smoking and the *use of alcohol* were each measured with one item: respectively, “How many cigarettes or cigars do you, as a rule, smoke per week?” and “How many alcoholic drinks do you, as a rule, have weekly?”

Healthy dietary habits were assessed by two items of the Short Food Frequency Questionnaire⁴⁹ about breakfast habits and fruit intake. Responses were rated from zero to seven days a week.

Relaxation was assessed by two items on five-point Likert scales (1, totally disagree; 5, totally agree). The items were as follows: “I experience enough moments of relaxation moments during work” and “I experience enough moments of relaxation in my private situation”.

Employees health and sustainable employability

Perceived health, assessed by a self-rated health question on a five-point Likert scale: “How would you estimate your current state of health?” with responses as follows: 1 *poor*, 2 *rather poor*, 3 *good*, 4 *very good*, 5 *excellent*.

Emotional exhaustion was assessed with a sub-scale of the Utrecht Burnout Scale (UBOS)⁵⁰ on seven-point Likert scales (0, never; 6 always). An item example is as follows: “I feel mentally exhausted by my work” (Cronbach $\alpha = 0.86$).

Vitality at work was measured by a subscale of the Utrecht Work Engagement Scale (UWES)⁵¹. This six-item scale was assessed on seven-point Likert scales (0, never; 6, always). An item example is as follows: “At work, I feel bursting with energy” (Cronbach $\alpha = 0.86$).

Sustainable employability, measured with one item: “Taking your health into consideration, do you expect in 5-10 years that you will still be able to do this work?” (1, no; 2, maybe; 3, yes, definitely).

Additionally, a transition scale, *the Global Perceived Effect (GPE)*⁵² of the intervention was measured by one question: “Are you, compared to 18 months ago, personally more actively engaged with the topics of health and vitality at work?” (0, no; 1, yes). This GPE measure was only assessed at the second measurement.

Covariates were as follows: age (five-year groups), gender, educational level (primary, secondary, higher educational level), shift work (yes/no) and type of work (both physical and mental work/ mainly physical work).

Statistical procedure

To evaluate the effects of the intervention, multiple linear regression analyses were performed for all outcome variables. The measure of the intervention effect was expressed by the standardized β 's and the 95% confidence interval. The standardized β 's were used to prevent distortion of the various scales. For all analyses $P < 0.05$ was interpreted as a significant difference (two-tailed).

First, to investigate the effectiveness of the LSI on bonding social capital, openness towards health and vitality at work and autonomous motivation towards a healthy lifestyle, the post-intervention variables were regressed onto the IG and the baseline measures of these variables. Thus, the post-intervention outcome variables were each taken into the model as dependent variables, and the IG and the baseline variables as independent variables. In this way the IG was used as a nominal predictor in the model, and the analyses were adjusted for the baseline measures.

Then, the same regression analyses were performed on the presumed derived outcomes variables lifestyle, health, vitality at work and sustainable employability. Again, the post-intervention variables on these variables were each taken into the model as dependent variables, and the IG and the baseline measures of these variables as independent variables. The IG was used as a nominal predictor, and the analyses were adjusted for the baseline

measures on these variables. All regression analyses were adjusted for age, gender, educational level, shift work and type of work.

Subsequently, in order to investigate the sensitivity of the intervention components, all outcome variables were each regressed onto the DG, the CVG and the IPG, respectively, and on their baseline measures. In these regression analyses, the three intervention components were each taken into the model as nominal predictors.

Results

Table 1 presents the employees' characteristics as well as the baseline variables for the IG and the CG. There were no significant differences of age, gender, educational level, shift work and type of work between the two groups. Differences at baseline level were found for bonding social capital, openness towards health and vitality at work, vitality at work and emotional exhaustion. The analyses were adjusted for these differences at baseline in the regression models.

Table 1: Baseline characteristics

	Control group (N = 130)	Intervention Group (N = 194)	Total sample (N = 324)
Individual characteristics			
Gender (% male)	80.0	76.8	78.1
Age (%)			
- < 30 yr	18.5	12.4	14.8
- 30-45 yr	39.2	36.1	37.3
- > 45 yr	42.3	51.5	47.8
Educational level (%)			
- Primary	24.6	20.6	22.2
- Secondary	37.7	44.8	42.0
- Higher	37.7	34.5	35.8
Shift work (%)	23.8	25.8	25.0
Type of work (% physical work)	38.5	29.4	33.0
Outcome variables (Mean, SD)			
• Bonding social capital (1 <i>low</i> – 5 <i>high</i>)	3.41 (0.72)	3.58*(0.59)	3.51 (0.65)
• Openness towards health and vitality at work (1 <i>low</i> – 5 <i>high</i>)	3.12 (0.81)	3.38* (0.81)	3.28 (0.82)
• Autonomous motivation towards a healthy lifestyle (1 <i>low</i> – 5 <i>high</i>)	3.65 (0.57)	3.71 (0.59)	3.68 (0.59)
Employees' lifestyle			
• Physical activity (days/ week)	2.88 (1.44)	3.07 (1.35)	2.99 (1.39)
• Smoking (amount/ week)	10.1 (26.4)	11.4 (27.9)	10.9 (27.3)
• Alcohol use (amount/ week)	7.42 (9.46)	6.41 (6.66)	6.82 (7.90)
• Healthy dietary habits (days/ week)	5.45 (1.57)	5.56 (1.45)	5.50 (1.50)
• Relaxation (1 <i>low</i> – 5 <i>high</i>)	3.60 (0.76)	3.72 (0.73)	3.67 (0.74)
Employees' health and sustainable employability			
• Perceived health (1 <i>low</i> – 5 <i>high</i>)	3.22 (0.84)	3.30 (0.74)	3.27 (0.78)
• Emotional exhaustion (0 <i>low</i> – 6 <i>high</i>)	1.36 (1.07)	1.07*(0.85)	1.18 (0.95)
• Vitality at work (0 <i>low</i> – 6 <i>high</i>)	4.59 (0.89)	4.82*(0.77)	1.19 (0.82)
• Sustainable employability (1 <i>low</i> – 3 <i>high</i>)	1.77 (0.46)	1.81 (0.43)	1.79 (0.44)

*p < 0.05

Intervention effects

Table 2 presents the intervention effects on the outcome variables. The LSI was effective in bonding social capital ($\beta = +0.10$, $P < 0.05$) and in openness towards health and vitality at work ($\beta = +0.11$, $P < 0.05$). No intervention effect on autonomous motivation towards a healthy lifestyle was found.

Table 2: Intervention effects on the measured outcome variables

Outcome variables	Intervention effect β (CI)
• Bonding social capital	+0.10* (+0.00 - +0.20)
• Openness towards health and vitality at work	+0.11* (+0.01 - +0.21)
• Autonomous motivation towards a healthy lifestyle	+0.04 (-0.05 - +0.13)
<i>Lifestyle</i>	
• Physical activity	+0.08 (-0.02 - +0.17)
• Smoking	-0.07* (-0.14 - -0.00)
• Use of alcohol	+0.04 (-0.03 - +0.11)
• Healthy dietary habits	+0.08* (+0.01 - +0.15)
• Relaxation	+0.08 (-0.02 - +0.18)
<i>Health and vitality at work</i>	
• Perceived health	+0.07 (-0.02 - +0.16)
• Emotional exhaustion	-0.06 (-0.15 - +0.03)
• Vitality at work	+0.07 (-0.02 - +0.15)
• Sustainable employability	+0.10* (+0.01 - +0.20)

* $p < 0.05$

The LSI was also effective in healthier lifestyle behaviors with regard to smoking ($\beta = -0.07$, $P < 0.05$) and healthy dietary habits ($\beta = +0.08$, $P < 0.05$). In addition, an intervention effect for perceived sustainable employability was found ($\beta = +0.10$, $P < 0.05$).

Sensitivity analyses

Table 3 presents the findings of the sensitivity analyses. The dialogue component in particular had a positive effect on bonding social capital ($\beta = +0.18$, $P < 0.05$) and on openness towards health and vitality at work ($\beta = +0.12$, $P < 0.05$). Dialogue also had a positive effect on healthy lifestyle behavior, regarding smoking ($\beta = -0.07$, $P < 0.05$) and

healthy dietary habits ($\beta = +0.09, P < 0.05$), and on sustainable employability ($\beta = +0.13, P < 0.05$).

No effects on bonding social capital, openness toward health and vitality at work or on autonomous motivation towards a healthy lifestyle could be attributed to the collective vitality activities. However, a positive effect of collective vitality activities on healthy dietary habits was found ($\beta = +0.10, P < 0.05$).

Participation on an individual basis in physical activities had a positive effect on openness towards health and vitality at work ($\beta = +0.14, P < 0.05$) and on autonomous motivation towards a healthy lifestyle ($\beta = +0.12, P < 0.05$).

Table 3: Sensitivity analyses – intervention effects for dialogue, the collective vitality activities and the individual participation in physical activities.

Outcome variables	DG (N = 137)	CVG (N = 148)	IPG (N = 68)
	β (CI)	β (CI)	β (CI)
• Bonding social capital	+0.15*(+0.04 - +0.25)	+0.08 (-0.03 - +0.19)	+0.08 (-0.05 - +0.21)
• Openness towards health and vitality at work	+0.12*(+0.01 - +0.23)	+0.11 (-0.00 - +0.22)	+0.14*(+0.01 - +0.27)
• Autonomous motivation towards healthy lifestyle	+0.06 (-0.03 - +0.16)	-0.02 (-0.08 - +0.12)	+0.12*(+0.01 - +0.24)
<i>Employees' lifestyle</i>			
• Physical activity	+0.06 (-0.05 - +0.16)	+0.08 (-0.02 - +0.18)	+0.03 (-0.09 - +0.15)
• Smoking	-0.07*(-0.16 - -0.01)	-0.07 (-0.15 - +0.00)	-0.08 (-0.17 - +0.00)
• Use of alcohol	+0.05 (-0.03 - +0.13)	+0.05 (-0.02 - +0.13)	+0.05 (-0.05 - +0.15)
• Healthy dietary habits	+0.09*(+0.01 - +0.16)	+0.10*(+0.03 - +0.18)	+0.04 (-0.04 - +0.13)
• Relaxation	+0.11 (-0.01 - +0.21)	+0.10 (-0.03 - +0.21)	+0.13 (-0.00 - +0.26)
<i>Employees' health and sustainable employability</i>			
• Perceived health	+0.07 (-0.03 - +0.18)	+0.07 (-0.03 - +0.18)	+0.09 (-0.03 - +0.22)
• Emotional exhaustion	-0.07 (-0.17 - +0.04)	-0.05 (-0.16 - +0.06)	-0.03 (-0.16 - +0.11)
• Vitality at work	+0.08 (-0.01 - +0.17)	+0.04 (-0.05 - +0.13)	+0.10 (-0.00 - +0.21)
• Sustainable employability	+0.13*(+0.03 - +0.23)	+0.09 (-0.01 - +0.19)	+0.12 (-0.01 - +0.23)

* $p < .05$

Global perceived effect

In total, 30.0 percent of all participants indicated that they were more actively engaged with the topics of health and vitality compared to 18 months previously. This applied to 35.2 percent of the IG, whereas it applied to 22.3 percent of the CG. This difference is statistically significant ($\chi^2 = 6.18, P < 0.05$).

Discussion

In this study, organizational *change* theories were combined with WHP knowledge to induce a health-promoting self-regulatory social change process within a Dutch dairy company. An organization-specific application of the Intervention Mapping procedure resulted in the application of the principles of Large-Scale-Interventions (LSI). The theoretical rationale behind this intervention was based on its expected contribution to social capital, to openness towards health and vitality at work and to self-regulatory capacities³⁸.

The intervention appeared effective for bonding social capital and openness towards health and vitality at work, which was particularly attributable to the dialogue component of the intervention. These findings support the organizational relevance of a substantial dialogue on human-oriented topics like health and vitality at work. Because social capital includes collaboration, mutual trust and justice in interpersonal relations²⁷, social capital should primarily be seen as an organizational capacity. Social capital, however, should not be confused with social support, although both constructs have some similarities. Social capital inherently addresses mutuality, whereas social support does not necessarily reflect reciprocity. Recently, the difference between social capital and social support has been demonstrated⁵³. Beneficial pathways of social capital for example are suggested by a presumed contribution to a sense of purpose and belonging. This pathway is less likely for social support.

No overall intervention effect was found on autonomous motivation towards a healthy lifestyle. However, in the IPG a positive effect on autonomous motivation towards a healthy lifestyle was found. The actual experience of physical activities appeared important for

improving autonomous motivation. Based on these results, the active and personal experience of tangible physical activities seems important to assign value towards health.

This study suggests an LSI to be a useful tool for altering a health-promoting social work environment. As a derivative an increase in a healthy lifestyle, health and vitality at work of large groups of employees may be expected. In this study, indeed healthier lifestyle behavior with respect to smoking and dietary habits were found; the effects are small, but they are statistically significant. Also, sustainable employability improved in the IG compared to the CG. However, no statistically significant level for the other presumed derivative measurements were reached, although the results in the intervention group all were in the desired health promotion direction (see Table 3). The presumed sequential effect, however, could only partially be confirmed.

Theoretical implications

In the literature, the relevance of using organizational theories in health science is recognized^{1,10}. In addition to substantive theories about *what* has to be changed to create a health-promotion organizational context, organizational social *change* theories can be used to determine *how* to induce a health-promotion social change process. This study was based on the use of these organizational social *change* theories, that are incorporated in the principles of Large-Scale-Interventions³⁸. Organizational social change principles were primarily used to support the change process, and not so much to determine the content of the intervention. Characteristic to the LSI principles is that interventions are not sequentially developed and then implemented, but are shaped and applied simultaneously by the stakeholders themselves. Consequently, the actual intervention could not be planned entirely. Also, spillover effects between the departments could not be ruled out, and in organizationally and culturally bound interventions these may even be seen as a main intervention component⁵⁴. Application of this kind of organizational developmental principles inherently lead to methodological challenges⁵. By linking the intervention objectives to the strategic organizational goals and desired organizational development, by distinguishing between the overall intervention and its subcomponents, and by defining the groups “as treated”, it was attempted to meet the real-life challenges and simultaneously allow statements on effectiveness. A disadvantage of the “as treated” principle, however, is

that the IG and CG are not randomized in advance. By adjusting for any difference in baseline measure, it was attempted to resolve the issue of a possible selection in participation. However, in future research it is interesting to determine how these change principles can be applied in a randomized trial.

Practical implications

Fostering self-regulation within companies requires relevant stakeholders to develop ownership for the change: managers, policy makers and employees. In this study, the representative task group within the organization adopted the issues of health and vitality at work and shaped the intervention in close cooperation with other stakeholders. This process was largely self-regulatory at the organizational level. There was only a minor contribution from external experts within the process. Ownership for the change was certainly present within the task group(s). By adjusting to the organizational needs and desired organizational development, they succeeded to maintain health and vitality at work permanently on the management agenda. In addition, 30.0% of the entire population (35.2% of the IG and 22.3% of the CG) indicated that they became more engaged with the topics of health and vitality at work. The LSI therefore has brought about a sense of ownership for health within this part of the employee population. Agenda-setting and ownership are important steps in a self-regulatory and sustainable change process^{1,38}. On the basis of the findings, an LSI probably has the potential to initiate a self-regulatory change process and to develop ownership on the topic of health in a considerably part of the whole population. However, more studies akin to this are needed to allow definitive statements on the value of these change principles on population health.

In self-regulatory processes, work units and employees may not have the same experiences in terms of type and intensity of the intervention. On the one hand, from an intervention design point of view this can be seen as problematic, since there is not always an accurate picture of what is happening in the process. On the other hand, it probably better fits to the local and/ or personal needs and employees' personality. Since self-regulation appeal on motivation and ownership, it potentially enables managers and employees to make their own specific next step in health promotion, appropriate to their needs in ever changing circumstances.

Limitations

Due to the pragmatic nature of the study, it was not possible to define mutually exclusive subgroups of the intervention components. The DG for example consisted of people who had experienced at least the dialogue component, but they may have experienced one of the other components as well. This type of group classification may have led to an overestimation of the effects of the separate intervention components. Despite the small groups, we repeated the analyses for two mutually exclusive intervention components; namely, the “pure” DG without any other components (N = 40), and the “pure” CVG (N = 38). The dialogue effect on bonding social capital is also found when the “pure” DG is added into the regression analyses. Also, an effect of collective vitality activity on healthy lifestyle is found when using the “pure” CVG. The fact that the findings in these smaller subgroups corresponded to the sensitivity analyses shown in this study confirms the interpretation of the effects of the separated intervention components.

Although the entire workforce was invited to complete both questionnaires, only 324 out of the initial 1,152 employees actually did so. This can partly be explained by a number of changes in the workforce that occurred in the company. The selection of people who had extra motivation towards health may have occurred as well. Additionally, the measures were self-reported. Objective data with respect to lifestyle behavior and employees’ performance could provide relevant additional information in future studies. Common method variance may have contaminated the findings. It was tried to avoid this kind of bias by using validated questionnaires as much as possible, by using reversed items and by encouraging that there were no good or wrong answers⁵⁵. Also, this study was based on a male-dominated industrial company. The findings may be generalizable to other male-dominated industrial companies, but caution is required toward broader generalizability. Finally, inducing a collective change process requires a critical mass of actors that will deploy the change. Before starting an LSI, health promoters and organizations should be aware of the need for the active involvement of all stakeholders. Given the results of this study, it appears worthwhile to make the necessary (time) investment to use the principles of organizational change processes to enable communities to take the next steps in health promotion.

Conclusions

This organizational Large-Scale-Intervention, aimed at inducing a self-regulatory health-promotion social change process, was found to be effective on bonding social capital and on openness towards health and vitality at work. Also, intervention effects were found for smoking, healthy eating and sustainable employability. The observed effects were mainly attributable to the dialogue component of the intervention. In addition, the LSI developed ownership on the topic of health in a considerably part of the whole population, which can be seen as an important first step for sustainable health. This study confirms the relevance of combining organizational change processes with health promotion.

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