General discussion

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Health is an important resource for optimal human functioning of employees[1], of sustainable employability among employees[2], and for active participation of individuals in society[3]. Maintenance and promotion of health in modern society, however, is a major challenge for most countries all over the world[4], especially in times of ageing populations[5], in times of increase of non-communicable diseases (NCDs)[6,7], and in times of an increase of psychosocial risks[8,9,10].

The focus of this thesis was on the maintenance and promotion of health of large groups of individuals[11]. A social change process[12] that fosters self-regulation[13] in health was presumed to contribute to enhancing population health. A system's based work setting approach[14,15] was used to induce such a change process within organisations. Characteristic to a setting approach is that it stems from an ecological perspective, it applies a systems approach and it is focused on development and change[15]. The main reason to choose the setting *work* for health promotion was that organisational (change and learning) theories compile knowledge on how to induce a collective change process within organisations and among employees[16,17,18,19,20,21,22].

By making use of this organisational knowledge, this thesis specifically focused on *organisational* health interventions, rather than on *individual* health interventions[23]. Whereas individual health interventions primarily target employees' health, organisational health interventions focus on organisational features, such as organisational culture, leadership or work-processes[23,24]. The relevance of organisational health interventions[23], as well as the use of organisational change theories in health promotion[25] is often addressed. To date however, organisational health interventions are still in the minority in work-health science. Complexity of implementation and evaluation are frequently mentioned reasons[24,26].

Figure 1 presents the model on the health and business relevance of organisational health interventions used in this thesis. Organisational health interventions primarily target health-promoting organisational features. These organisational features are expected to contribute to organisational development and performance of the organisation as a whole. Also, these organisational features are expected to promote employees' health, which may, in turn, improve employees' performance and productivity. From a business perspective,

organisational health interventions have the potential to contribute to organisational development and simultaneously enhance employees' health and productivity. Such a parallel interest for example is described for organisational social capital[27].

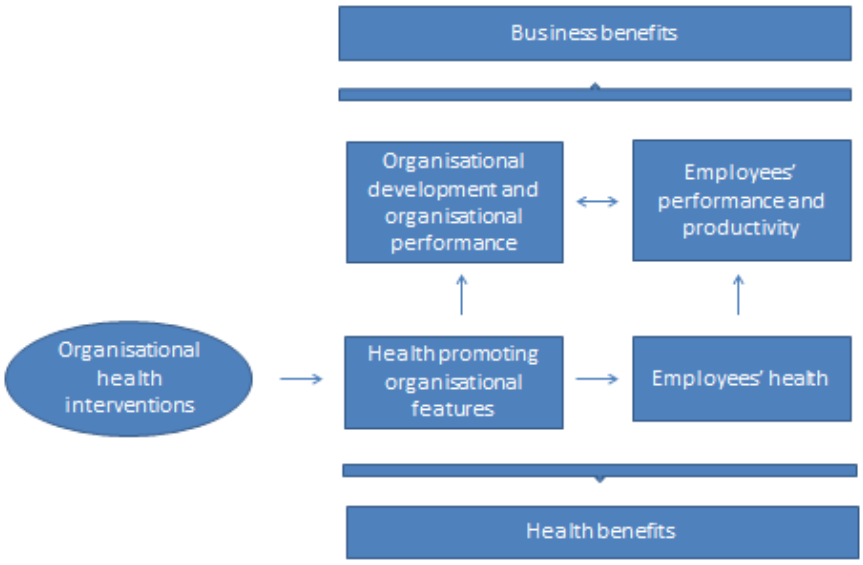

Figure 1: *Organisational health interventions and the suggested ways to contribute to health and business benefits.*

By using a system's approach in the work setting, the main aim of this thesis was to contribute to knowledge on how to induce a social change process that fosters self-regulation in health within organisations. By specifically focusing on organisational health interventions, it was also aimed to contribute to a more effective way to influence worksite health. Lastly, an organisational health intervention aimed at promoting social capital and self-regulation in health was developed, applied and evaluated.

The objectives of the thesis were:

1. To examine the parallel health and business interest of organisational health promotion, and to provide insight in *how* this parallel interest can be served simultaneously,
2. To provide an insight into the variety of ways by which health can be meaningfully embedded within companies,

3. To investigate how to develop an organisational health intervention, to apply such an intervention and to examine its effectiveness on social capital and self-regulation in health.

This chapter firstly discusses the main findings in the light of these objectives, resulting in three main insights obtained through this thesis. Secondly, methodological considerations regarding organisational health interventions are discussed. Lastly, recommendations for future studies and future organisational health interventions are proposed.

Overview of the findings

Towards a parallel health and business interests of organisational health interventions

In order to obtain commitment for health interventions by organisations it is important to look at ways in which a parallel health and business interest can be served simultaneously[28,29]. This thesis therefore started with three studies in which the association between health and employees' performance was examined. In addition, these studies provided insights in what organisational features may serve a parallel health and business interest.

Chapters 2 through 4 confirmed health and vitality at work as a meaningful resource for employees' functioning[1]. Table 1 shows the associations found in this research between health indicators and employees' performance, expressed by absenteeism, presenteeism (employees are at work, but in their work hampered by health complaints) and effective personal functioning. Perceived health was examined in two studies and was found to be negatively associated with absenteeism and presenteeism (Chapter 3 and 4), and positively associated with effective personal functioning (Chapter 3). Vitality at work was examined in two studies and was found to be negatively associated with presenteeism (Chapter 4) and positively associated with effective personal functioning (Chapter 2). Emotional exhaustion was examined in one study and was found to be positively associated with absenteeism and presenteeism, and negatively associated with effective personal functioning (Chapter 3). No significant association between vitality at work and absenteeism was found.

Table 1. Significant negative (↓) and positive (↑) associations found between health indicators and employees' performance

	Employees' performance		
Health indicators	Absenteeism	Presenteeism	Effective personal functioning
- Perceived health (good)	↓ [3,4]	↓ [3,4]	↑ [3]
- Vitality at work (high level)	ns	↓ [4]	↑ [2]
- Emotional exhaustion (high level)	↑ [3]	↑ [3]	↓ [3]

ns: no significant association found, 2: significant association found in Chapter 2, 3: significant association found in Chapter 3, 4: significant association found in Chapter 4.

Chapters 2 through 4 also provided insights in what organisational features are important to promote employee's health and performance. In Chapter 2, organisational culture was found to be an important organisational feature for vitality at work. Chapter 3 focused on one specific cultural dimension, namely organisational social capital. Organisational social capital, referring to collaboration, trust and justice[27], was positively associated with employees' health. Especially *bonding* social capital[30,31], a horizontal component of social capital perceived between employees who are similar in terms of social identity, was found to be relevant for employees' health. In Chapter 4 autonomous regulation towards healthy living was found to underlie various types of health behaviours, related to both lifestyle and work style. Autonomous regulation refers to behaviours that are congruent with personally endorsed values, goals and needs[32]. The study in Chapter 4 suggested internalisation of the value of health as an important strategy to improve various health behaviours among employees. A supportive social context was presumed to contribute to this internalisation process. Based on the findings in Chapter 2 through 4, an increase of (bonding) organisational social capital, as well as creating a social context that contributes to the internalisation of the value of health were identified as meaningful objectives of an organisational health intervention aimed at fostering self-regulation in health.

Embedding health within organisations

In organisational health intervention it is particularly important to find ways to embed health within the organisation[24]. Three different ways to embed health within organisations have been described in Part 2 of the thesis.

Chapter 5 described a value case for health management within an organisation. The value case methodology initiated a process in which stakeholders jointly defined the full value of health, and encouraged active commitment of stakeholders with health management. In addition, this value case revealed a plausible relationship between organisational development and health promotion within the organisation involved. Recently, the focus on value orientation with respect to health promotion has increased. Value clarification methods, for example, are suggested to improve decision-making processes in favour of health and to foster health outcomes[33]. However, these methods are still in its infancy. The small number of evaluations and the heterogeneity in outcome measures do not yet allow statements about the overall effectiveness[33]. Chapter 5 of this thesis adds to the current knowledge by describing generic characteristics of a value case methodology.

The underlying idea in Chapter 6 was that health could be embedded within organisations by incorporating health indicators in management control. Management control is primarily aimed at supporting good decision-making processes by managers. To support a good decision making process management control should include tangible and intangible indicators[34]. In Chapter 6 relevant tangible and intangible Key Performance Indicators (KPIs) for health were derived from the literature and combined with practical experiences from 4 front-runner companies on health management in the Netherlands. However, it was found that even in the front-runner companies involved, these indicators were neither well defined nor consequently managed. A potential useful way of embedding health in organisations therefore still remains underutilised.

The rationale of Chapter 7 was that organisations increasingly set their 'core values' to express their corporate identity and to give direction to their way of doing. Values that are underlying health, safety and well-being in organisations were identified from the literature. From a business ethics and Corporate Social Responsibility (CSR) perspective, these values could be useful to develop a desired organisational identity[35]. At the same time, these values

are supporting employees' health, safety and well-being. The application of these values was suggested to enable a stronger connection between a health-promotion culture [36] and the general organisational culture. Unlike health, core values and corporate identity are often strategic business items. The identified core values therefore potentially can get a high degree of attention, while health will be promoted simultaneously.

Based on the Chapters 5 through 7, a broad value orientation on health within the organisation and the use of intangible performance indicators are likely to be useful to embed health within organisations.

Developing, applying and evaluating organizational health interventions

Part 3 of this thesis was about the development and evaluation of organisational health interventions. In Chapter 8, a Delphi procedure was performed to identify organisation-specific factors for the development of health interventions in organisations: 'Organisational Mapping' (OM). A panel of experts from various scientific fields agreed on the relevance of a large number of organisation-specific factors to be taken into account when developing health interventions in organisations. OM contributes to the need for an optimal alignment with the organisational context. In Chapter 9 an organisational application of the Intervention Mapping protocol resulted in a Large-Scale-Intervention[37] aimed at inducing a health-promoting change process within a Dutch dairy company. Its effectiveness on social capital, on openness towards health and on autonomous motivation towards health is investigated and described. The intervention was found to be effective on bonding social capital, and on openness towards health and vitality between leaders and employees and among employees. In addition, intervention effects were found for healthy dietary habits, for less smoking and for sustainable employability. The sensitivity analyses revealed that in particular the dialogue component of the intervention was effective in creating a health-promotion culture. This is in line with the few other studies on the effectiveness of dialogue in health promotion interventions[38,39]. Evidence for the utility of dialogue and interaction in developing supportive cultures is stronger in safety science[18,40,41]. Based on the findings in this thesis, as well as the fact that health and safety in organisations have a lot in common, it was concluded that dialogue is probably a meaningful intervention component of organisational health interventions.

Main insights arising from this thesis

This thesis has led to three important insights for organisational health interventions. In particular, the findings with regard to social capital, self-regulation and 'Organisational Mapping' (OM) are innovative and worth to consider further.

Organisational social capital

This thesis confirmed organisational social capital as important unifying construct that combines business and health interests. From a health perspective, social capital is primarily seen in interaction with people's health[42]. In organisational science, however, organisational social capital is viewed as an organisational property that has value in itself[43,44]. From an organisational perspective, organisational social capital is seen as a part of the organisational identity, with a main influence on corporate image, organisational functioning and the interaction with the broader environment. Organisational social capital is therefore seen as a meaningful construct that enables the combination of health promotion and organisational development[27].

A theoretical confirmation for the relevance of social capital on health of employees is described in Chapter 7. Based on the literature, in Chapter 7 aspects of organisational social capital, i.e. collaboration, trust, openness and justice, were independently identified as core values that support health, safety and well-being at work. Support for the relevance of social capital on employees' health was thus found in the literature on the underlying values for employees' health.

A practical confirmation for the relevance of organisational social capital was found in the dairy company involved. Already before this research started, the company had identified collaboration, trust, participation and self-organizing as main cultural dimensions for business excellence. The relevance of good collaboration, trust and openness on employees' vitality and health was discussed in the company's project team, who indicated these factors to be important factors for vitality at work. In particular shift workers reported that a good collaboration, openness and mutual trust between the various teams led to more work pleasure and less fatigue. The shift workers indicated that for them being less tired was a decisive factor for a healthy lifestyle. In discussing the business and health relevance of social capital, the stakeholders involved developed commonality on the topic of

organisational social capital, which became a widely accepted objective of the organisational health intervention.

The relevance of organisational social capital was also confirmed by the data analyses in Chapter 3. Organisational social capital was found to be significantly and positively associated with employees' health. In particular *bonding* social capital was found as relevant for employees' health and performance. Bonding social capital refers to trusting and cooperative relations between members of a social network who are similar in terms of social identity[31]. This indicates that large groups of people may benefit their health by an increase in good collaboration, mutual trust and justice within organisations. This may be seen as a meaningful addition to research on a health-promoting organisational culture, that is often focused on the facilitating role of leaders[45,46,47]. In order to improve health, leaders and employees themselves might also do well to encourage good collaboration, mutual trust and justice. Chapter 9 showed that particularly dialogue improved bonding social capital. In Chapter 9 is was therefore concluded that facilitating dialogue among employees on issues that really matter is likely to contribute to organisational social capital. With this, dialogue provides the opportunity to foster business excellence and promote health among large groups of individuals simultaneously.

Self-regulation in health within organisations

Self-regulation in health in organisations includes an organisational and an individual aspect. At the organisational level, embedding health within organisations is an important self-regulatory process. This thesis supported the relevance of a broad value orientation on health to embed health within organisations (Chapter 5 and 7). In addition, active participation was found to be relevant to develop ownership for organisational and behavioural change among all relevant stakeholders. Instead of developing an intervention that is applied *to* individuals, self-regulatory processes require all relevant stakeholders to become active players who shape the change processes themselves. In line with collective learning theories, such as Theory U[19], this thesis confirmed the relevance of inducing a process in which stakeholders themselves shape the intervention. Participative approaches like the value case methodology (Chapter 5) and Large Scale Interventions (Chapter 9) were shown to be meaningful practical applications to induce self-regulatory processes at a collective level.

Self-Determination Theory (SDT)[32] was used as the theoretical foundation to examine self-regulation among individuals. More specifically, a sub-theory of SDT, the Organismic Integration Theory (OIT) was used. OIT distinguishes various motivational regulatory styles. In OIT, 'amotivation' describes a situation in which people are not motivated to perform a specific behaviour, whereas intrinsic motivation is the prototype of autonomous regulation. Between these two extremes, four different types of motivation ('regulatory styles') are distinguished, falling along a continuum towards internalisation. OIT emphasises the social context as important to enhance internalisation. In this thesis, autonomous regulation towards healthy living was found to underlie various types of health behaviours (Chapter 4). In line with other studies[48], support was found for transference or 'spillover' effects between autonomous regulation and various types of health behaviour among employees. The study suggested internalisation of the value of health in general to be relevant to improve various specific health behaviours among employees. Health promoters and organisations therefore would do well to address the value of health and to consider the development of interventions aimed at internalising the value of health among employees. This is different from traditional approaches used in health interventions in the setting work focused on promoting individual health behaviour. Interventions focused on promoting individual health behaviour within organisations commonly start with identifying specific health needs in a targeted group at risk. Interventions then are developed to solve the identified health problems. This thesis supported the idea of developing interventions at a higher level of abstraction, focusing on internalising the value of health in general. As theorised by OIT, the social context is important to enhance internalisation. In OIT especially autonomy and relatedness are understood as critical for internalisation. However, organisational social capital (Chapter 3) or the core values that support health, safety and well-being identified in Chapter 7 may be relevant as well. Though, this has to be confirmed in future research.

Developing organisation-specific interventions: Organisational Mapping

Organisational Mapping (OM) was developed in order to facilitate a proper developmental process of organisational health interventions. Such an organisation-specific version of Intervention Mapping[25] was still lacking in the literature. OM supports a profound understanding of organisations as entity, and facilitates optimal adjustment to the

organisational context, policy, practice and needs. Also, OM encourages health promoters to combine organisational and health science and practical experiences.

By supporting a profound understanding of the organisation as entity, OM can be used in the preparatory stage before developing the intervention and in the subsequently mapping steps. In Chapter 8, OM was also suggested to be a worthwhile health intervention in itself as well, since it requires relevant stakeholders to collaborate, to share their views and interests, to elaborate common ground, to encourage a shared-decision making process, and to participate in the change process. OM therefore shares some key principles of community-based health promotion[49].

OM is presumed to contribute to more effective organisational health interventions. Although this has to be confirmed in future research, the present thesis already gave support for the relevance of OM. In developing the organisational health intervention (Chapter 9), some of the principles of OM already were applied 'avant la lettre' (Chapter 9) through the participation in the developmental process of external as well as internal organisational consultants and change managers. Based on their knowledge and experiences, a relatively large amount of time and effort was put into the adjustment to the organisation-specific context, needs and policy. Also, the knowledge and experience of organisational consultants and change managers were used to properly understand the organisation as an entity and to define the organisation needs accordingly. In essence, it was precisely this experience by which it was decided to perform a Delphi procedure that led to the development of OM.

This organisational way of the application of the Intervention Mapping protocol resulted in an effective health-promoting organisational Large-Scale-Intervention. Important to note is that in organisational interventions, the design of the intervention developmental process to a large extent determines the ultimate effect[37]. Effects should therefore at least partially be assigned to the intervention developmental process that has been followed. Since OM facilitates both a good developmental process, and at the same time encourages health promoters to incorporate relevant organisation-specific factors, OM was presumed to offer key ingredients for effective organisational health interventions.

Methodological considerations of organisational health interventions

Organisational health interventions, primarily targeting at organisational features, are seen as complex innovations[50]. Organisational (health) interventions inherently include methodological difficulties[23,26,51]. Some main methodological challenges are described in this paragraph.

Participation in the organisational health intervention.

In organisational interventions, participation at the organisational level should be distinguished from participation at the employee level. Regarding the organisational level, in total nine organisations were invited to collaborate in this project. Three of them were willing to participate in the organisational intervention project. Despite the fact that organisations could participate for free, six organisations decided not to participate. The main reason was that these organisations were reluctant to start an open-ended developmental process. Also, it was not common for organisations to use principles of an organisational developmental process for health promoting purposes. By applying, describing and evaluating an organisational health intervention, this thesis may contribute to mainstreaming the combination of organisational development and health science.

Regarding the participation rates among employees, participation in filling out the questionnaire to evaluate the intervention should be distinguished from participation in the intervention. In the post-intervention measurement, employees were asked what intervention components applied to them (Chapter 9). In total 194 employees, out of a sample of 324 employees, reported that at least one of the components of the intervention applied to them. The intervention thus had a reach of about 60% of the employees within this sample, whereas 40% of the employees did not experience any intervention component. As the participation rates in individual lifestyle interventions often are lower [52], this participation reach should be seen as satisfactory. By targeting organisational features, organisational health interventions can be arranged as a 'whole population approach', and therefore may have the potential to reach relatively large groups of people.

Organisational development and knowledge development

In this thesis, the organisational development was understood as a social learning process[22,53]. This type of learning can be distinguished from cognitive learning[54]. This social

learning perspective implies that organisational development occurs through social interactions among stakeholders. Consequently, organisational knowledge development was based on a combination of practical experiences, knowledge from stakeholders and the use of organisational learning theories. In this thesis, practical experiences and knowledge were particularly used in Chapters 5, 6, 7 and 8, in which the way to embed health within organisations was described. Various experts and stakeholders were consulted, and actively participated in the studies. This way of knowledge development can be seen as complementary to hypothesis-testing knowledge development, which is often used in workplace health promotion science. Application of the developed organisational knowledge in various contexts is required to allow statements about the usefulness of it.

Evaluation of organisational health interventions

Whereas for interventions focused on promoting individual health behaviour a randomised controlled trial (RCT) is often seen as the highest standard to evaluate the effectiveness of interventions, for organisational interventions an RCT approach is often problematic[51]. First, a randomised allocation of individuals to an intervention or control group is often not possible in organisational interventions. Even cluster randomisation is often complicated. In organisational interventions, contextual factors, as well as the design of the intervention developmental process are important for the overall effect[37]. It is often difficult, or even impracticable, to obtain situations in advance that are exactly comparable on organisational features and developmental process.

In addition, organisational interventions inherently interact with changing environments. Controlling for these environmental factors is often not possible, since it is beyond the control of organisations, health promoters and researchers. In organisational culture development, controlling is even not desirable. Cultures grow from within. In cultural interventions people are encouraged to interact with each other, and to reflect on their commitments and underlying assumptions. They are presumed to collectively learn new patterns of behaviour[22]. A wide dissemination of these new insights and patterns should be seen as a success of the intervention, but is not in accordance with the requirements of an RCT to avoid interference and disturbances between various groups.

Lastly, organisational interventions such as LSIs should primarily be seen as collective developmental processes. It is not so much that an intervention is applied *to* the targeted

group. Instead, the stakeholders themselves give shape to the intervention. Therefore it is not possible to completely plan the intervention in advance. In addition, this raises the question whether or not the intervention at any time can be classified as 'ready' to be evaluated, or whether the intervention should primarily be understood as a (continuous) improvement process.

In order to adjust to the requirements of the organisational setting, allocation to the intervention and control group to examine the effectiveness was done 'as treated', and were thus made in accordance to the intervention components that were actually applied to the employees. Also, tailor-made objectives at the environmental and employee level were identified to express the impact of the intervention. A quantitative evaluation, however, does not *fully* reflect the whole impact of the intervention. In the literature, comprehensive evaluation methods[51], realistic evaluation methods[55,56], and circular evaluations[57] are recommended to evaluate complex organisational health interventions. Therefore, the overall study underlying this thesis provided extensive qualitative methods, additionally to the quantitative data described in Chapter 9. Semi-structured interviews, focus group dialogue sessions, as well as evaluative narratives were used. However, because of the time constraints for this thesis, it was not possible to work out, describe and analyse all these qualitative data. It is certainly relevant to do this in a subsequent study.

External validity of organisational health interventions

In this thesis the effectiveness is described of the participative LSI in one organisation (Chapter 9). However, the intervention was also applied in two other organisations. Since these organisational interventions were tailored to the specific organisations, the various data was not sufficiently comparable to combine them for all three companies. However, unpublished analyses of the data of the two other organisations showed for both organisations also a positive intervention effect on health-promoting organisational features such as social capital. In one company an intervention effect on personal initiative, which is seen as self-regulatory capacity, was found as well. This suggests additional support for the relevance of LSIs for organisational health promotion. However, caution regarding external validity is still required.

Considering the external validity of organisational health interventions, it is important to take the developmental nature of this kind of interventions into account. Inducing sustainable change in organisations places high demands on the process. The process largely determines the success of the intervention, sometimes even more than the content that is indeed primarily the domain of the stakeholders themselves[37]. This has also implications for the external validity of this kind of organisational interventions. Evaluation and making statements about external validity of organisational health interventions place high demands on the process evaluation of the intervention.

Quantitative data by means of surveys

Chapters 2, 3, 4 and 9 of this thesis are predominantly quantitative in nature. On-line questionnaires were used to collect the data. This method of data collection has some methodological shortcomings that should be mentioned.

As participation in the surveys was voluntary, bias due to selective response cannot be ruled out. The response of about 55% at baseline in the dairy company was considered to be satisfactory. Important to notice is that the sample was compared with the personnel list, from which it was concluded that the participants of the study were representative for the entire organisation. However, due to many changes within this organisation and non-response at the follow-up measurement, the evaluation of the intervention was based on data of 324 employees (out of the initial 1,152). Findings of the effect of the intervention are therefore based on a relatively small part of the entire workforce (28%). Because no information is available on the non-responders, selective non-response might have influenced the findings.

In addition, common method variance may have contaminated the findings. It was attempted to avoid this bias by using validated scales as much as possible, by making use of reversed items and by emphasising that there were no good or wrong answers[58].

Recommendations for future studies

In the current thesis, organisational and health theories were combined. To date, this combination has rarely been used in this kind of research in the work setting. Based on our findings, it makes sense to continue with this type of organisational health research. Future studies on the cutting edge of organisational and health sciences seem useful to develop and

describe new theories that comprise evidence, experiences and practical knowledge of both scientific fields. The following paragraphs describe where more knowledge is needed and discusses the implications for evaluations.

Wider application of the developed knowledge

This thesis provides insights in how to induce a social change process within organisations that contributes to the maintenance of health of large groups of individuals. Although this thesis is limited to the work setting, it is conceivable that the obtained knowledge on social capital and on self-regulation can be meaningfully applied in other settings, such as school and neighbourhoods. Social capital for example is often the subject of study in neighbourhoods and communities[42,59]. It is worthwhile to investigate whether the knowledge on social capital and self-regulation can be translated to other settings.

Active involvement of all relevant stakeholders, seeking common ground among stakeholders and mobilising (personal) leadership are key principles of values cases (Chapter 5), of Organizational Mapping (Chapter 8) and of Large Scale Interventions (Chapter 9). A similarity between these approaches and community-based health promotion[49] is recognisable. Indeed Organisational Mapping, Large Scale Interventions and community-based health promotion share actively participating stakeholders to exchange their views and interests and to elaborate common ground. Further integration between the knowledge developed in this thesis on developing and applying organisational health interventions and community-based health promotion therefore seems sensible.

Additionally, more insight in the potentially broader impact of these change processes is desirable. More specifically, it is interesting to investigate the extent to which the change process is adopted by employees and translated into their private lives. Also, it is worthwhile to investigate whether this type of change processes have a broader impact than the targeted employee population. It is, for example, relevant to determine whether an effective organisational change process could also influence other people, such as people in the area of the company or employees' relatives.

Self-regulation within the participatory society

During the course of this thesis, the Dutch government (i.e. the government known as 'Rutte II') has embraced the principles of the participatory society. All citizens are expected to

contribute according to their abilities. This change appeals to the self-regulatory capacity of society as a whole, of institutions, and of individuals. In addition to self-regulation of organisations regarding health[60], this also implies a more prominent role of self-regulation regarding health among individuals. Although the word 'self' in self-regulation regarding health for many predominantly has an individual connotation, and the participatory society in the public debate is sometimes criticised as 'excessive individualism', this thesis showed that self-regulation cannot do without a supportive environment. In line with theories[32] and earlier studies[61], this thesis demonstrated the relevance of a supportive social environment for self-regulation. Social capital is suggested as a meaningful, supportive construct. In addition, this thesis indicated that inducing self-regulatory processes will probably benefit from a broad value orientation and a dialogue among stakeholders. These insights, although obtained in the organisational context, probably also make sense from the perspective of 'the participatory society'.

Implications for evaluations of organisational health interventions

Organisational health interventions should be seen as complex innovations[50]. Innovations require a revision of the existing situation and the common way of doing. Both the intervention itself, as well as its effectiveness, depends largely on the stakeholders and their interaction with a changing environment[37].

Nowadays, evaluations of workplace health promotion interventions usually include an effectiveness study and a process evaluation[2]. Statements on effectiveness are based on statistical differences regarding the targeted outcome health measures. The process evaluation usually focuses on factors influencing the implementation process. In organisational developmental interventions, however, other types of outcomes, such as organisational learning processes, may be relevant as well[51]. Organisational interventions may be accompanied by 'second order organisational learning processes'[37]. Second order organisational learning processes are a deeper form of collective learning, based on new insights and experiences about everyone's role and contribution in the change. These second order organisational learning processes shift the norms regarding interaction, relationships and communication. People learn to steer of, and contribute to, the learning process; it comes to a lasting change in interactions between people and collective behavioural patterns. Second order learning processes therefore are indicated to be the

sustainable or transformational effects. The extent to which these second order learning processes will occur cannot be planned in advance. It thus seems useful to develop and apply more open evaluation methods and to examine if these not necessarily foreseen second order effects actually occur. Collective learning theories are likely to provide a relevant basis to examine these second order organisational learning processes. An example is Theory U[19], a collective learning theory used to explain and change unproductive collective patterns. Based on the above it is recommended to evaluate organisational health interventions at three levels:

1. First order, presumed effects: evaluation of the theory-based hypothesised effects of the intervention on individual and environmental health indicators and outcomes,
2. Implementation process: evaluation of the way the intervention has been applied in practice, in interaction with a dynamic environment. The evaluation of the implementation process includes the participation or achievement of the intervention, as well as the barriers and facilitators of the implementation process in the specific context.
3. Second order organisational learning process: evaluation of the (unforeseen) second order organisational learning processes. This part of the evaluation answers the question whether other interactions, other communication, other mind-sets or other behavioural patterns have emerged.

In addition, since the effect of organisational health interventions to a large extent are determined by the (dynamic) context, it makes sense to describe the context, to examine how the context evolves and if this evolving context influences the effect of the intervention. Obviously, qualitative and quantitative methods should be combined to examine these broad implications of organisational health interventions[51].

Recommendations for future organisational health interventions

Based on the findings and on the overall learning experiences during this PhD-trajectory, the following suggestions for future organisational health interventions can be made.

Broad value orientation on health

This thesis provides support for the relevance of a broad value orientation and value determination on health for future organisational health interventions. A more profound

value assignment to health among stakeholders is likely to contribute to ownership for the change at a collective and individual level. Value cases are found to be relevant to identify the broad value of organisational health interventions for several stakeholders (Chapter 5). Value cases may therefore meaningfully underlie and support a change process in which various stakeholders are involved. When it comes to individuals, this thesis provides support for the relevance of internalising the value of health to improve various health behaviours.

Looking for parallel interests

Inducing a change process requires ownership for the change among all stakeholders. Ownership at the organisational level can particularly be obtained by searching for parallel health and business interests. As significant associations between employees' health and functioning were found, the business relevance of a healthy workforce was confirmed. In addition, this thesis suggests that a parallel interest can also be found in the development of an organisational culture that expresses a desired company identity, and at the same time develop a health-promoting social work-environment. Organisational social capital (Chapter 3), and setting core values that support health (Chapter 7) seem meaningful objectives to develop this parallel interest. In other words: the 'social dimensions of health' [62] are presumed to serve this dual interest of organisational development and a health promotion, and are therefore recommended to be used more frequently in practice.

Design of the developmental process

In organisational interventions, a good design of the developmental process to a significant extent determines the outcome[37]. Based on this thesis, active participation of stakeholders and looking for common ground (Chapter 5 and 9) are key components to develop and embed organisational health interventions. Principles of systems thinking and action research, which are incorporated in the participative Large Scale Intervention (Chapter 9), appear useful. Organisational Mapping seems an appropriate method to incorporate relevant organisational principles in a health intervention developmental process.

General conclusion

This thesis has contributed to insights on how to develop and implement organisational health interventions aimed at inducing a social change process that fosters self-regulation in health. Such interventions have the potential to counteract the threat of the collective increase of lifestyle-related non-communicable diseases (NCDs) and psychosocial risks in modern society.

Based on the findings, key elements on how to induce a social change process within organisations primarily include the process of embedding health within organisations. A broad value orientation, a profound search for parallel health and business benefits, active involvement of all relevant stakeholders, and an optimal adjustment to the specific organisational context and needs are recognised as decisive factors for effective organisational health interventions. Value cases, Organisational Mapping and Large-Scale-Interventions are suggested to be meaningful approaches to support and develop organisational health interventions.

The findings support the relevance of the 'social dimensions of health'. Large groups of people are likely to benefit their health by an increase of organisational social capital. In addition internalising the value of health appears important for various health behaviours. Dialogue on the value of health is found as a main intervention component of organisational health interventions aimed at creating a culture that fosters self-regulation in health.

The knowledge obtained in this thesis facilitates health promoters to consider a shift in workplace health promotion from a predominantly individual focus on physical and mental health of individuals towards an organisational focus on how to develop healthy organisations. A healthy organisation is characterised by a culture that promotes collaboration, trust, justice and supports self-regulation, by which the health and functioning of employees and the organisational as a whole will be promoted simultaneously.

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