General discussion
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The main objective of this thesis was to explore ways to decrease work stress in teachers from an individual, organizational and intervention evaluation perspective, and thereby eventually contribute to excellent education. The exploration was conducted along three key questions:

1. How can we decrease work stress in teachers from an individual perspective?
2. How can we decrease work stress in teachers from an organizational perspective?
3. How can we gather the most relevant evidence in intervention studies in the occupational setting, for example to decrease work stress?

In this chapter the main findings are presented. Thereafter these findings are placed in context and (methodological) considerations are described. Lastly, recommendations for future practice and research are discussed.

Main findings

How can we decrease work stress in teachers from an individual perspective?

In order to answer this question a longitudinal study among 549 older teachers (aged 45-64 years) was conducted, wherein the role of a personal resource, mastery, in the decrease of work stress was studied (chapter 2). Path analysis was applied to explore the interplay between mastery and job demands on the one hand (i.e. psychological demands and emotional demands) and job resources on the other hand (i.e. autonomy and social support), in influencing work stress-related outcomes (i.e. depression and work engagement). Mastery had a direct negative influence on depression and a direct positive influence on work engagement, whereas it partly explained the longitudinal relations between emotional job demands and both outcomes. Increasing mastery in teachers might be a promising intervention strategy to decrease depression and increase work engagement, although this finding requires replication and actual experimentation.

How can we decrease work stress in teachers from an organizational perspective?

A participatory, primary preventive, organizational level intervention was conducted among the employees of two secondary vocational education schools (school A and school B), in order to decrease work stress. The intervention had been developed by a consultancy firm and applied over a hundred times in both public and private organizations. However, it was never evaluated scientifically. As described in more detail in chapter 3, the intervention comprised a needs assessment phase (consisting of interviews, a questionnaire, and group sessions) and a phase of implementing intervention activities, which were derived from the needs assessment phase (e.g. structured performance reviews, or creating a staff room). A facilitator supervised the needs assessment phase and he was assisted by a participatory group of employees and staff members. In the phase of implementation of intervention activities the facilitator’s help was optional, and only one of the two schools (school A) purchased this aid. The primary hypothesis was that the intervention would decrease work stress when need for recovery was decreased and vitality was increased (chapter 4). In a controlled trial including 356 employees this hypothesis could not be confirmed. Two small but statistically significant effects in unfavorable direction were found on two of the secondary outcomes (i.e. absorption and organizational efficacy). However, post-hoc per protocol analyses demonstrated that employees who participated in at least two of the three steps of the needs assessment (e.g. questionnaire and group session) had a significantly higher post-intervention score on occupational self-efficacy (i.e. the belief in one’s ability at work) than the control group, which is favorable. This result indicates that those employees with a higher participation grade regarding the intervention, might have had a mastery experience, which then positively affected occupational self-efficacy.

The lack of positive effects on the primary outcomes could be partly due to implementation failure, as was described in the process evaluation in chapter 5. This evaluation showed that the needs assessment phase was implemented successfully in school A, but not in school B where participation and readiness for change were insufficient. The results for school A and B diverged further in the phase of implementation of intervention activities: in school A several intervention activities were implemented, whereas this was hardly the case in school B. Regardless of actual participation and actual implementation of intervention activities, participants in both schools felt not involved in the choice of intervention activities. Furthermore, in both schools participants generally perceived the intervention’s second phase negatively, for example because the intervention activities were not seen as the right solutions for the problems. Three type of context factors further inhibited the implementation. That is, the schools had no capacity (school B) or only partial capacity (school A) to implement the intervention activities, foremost because middle managers were not fully equipped to do so. Secondly, the organizational culture in both schools was characterized by a lack of mutual trust between managers and teachers. Thirdly, several external events interfered with the planned intervention activities (e.g. a national change was announced by the Ministry of Education, implying an intensification of classroom-bound lessons from 850 to 1000 hours per year).
In conclusion, further implementation of the intervention in its current form is not recommended. To decrease work stress in teachers (and other employees in schools) participatory, primary preventive, organizational level interventions should firstly include a more elaborate implementation strategy upfront, including an allocation of roles and responsibilities of all involved (i.e. Executive Board, directors, middle managers, intervention facilitator, participatory group, participants). Furthermore, those responsible for the intervention should communicate more specifically how the intervention activities to be implemented in the intervention’s second phase relate to the problems described in the intervention’s first phase (i.e. the needs assessment). Also, it should be taken into account that participants’ perception of what has happened during the intervention process can differ from what actually happened, underlining the importance of ‘appraisal’ in intervention processes. Lastly, the attitudes and actions of managers seem to be important for successful implementation, as well as the organizational culture.

How can we gather the most relevant evidence in intervention studies?

In designing the evaluation of the organizational level intervention two methodological problems were encountered, which led to chapter 6 and 7. Firstly, both schools wanted to participate in the study with a specific department, for which they believed the intervention would be most relevant. Although conceivable from the school perspective, this posed a methodological issue because randomization procedures were thereby obstructed. A controlled trial was conducted, making the effect evaluation prone to confounding and selection bias. As a consequence, baseline differences on several outcomes were present between the intervention and control group. Our intervention evaluation study was not the first to suffer from such a challenge and the narrative review (chapter 6) described this and other common challenges that occupational health intervention researchers encounter. In this chapter we furthermore explored alternative research designs for the situation wherein a regular Randomized Controlled Trial (RCT) is not feasible. One experimental alternative design (i.e. stepped wedge design) and several observational designs were found and discussed (i.e. propensity scores, instrumental variables, multiple baseline design, interrupted time-series, difference-in-difference, and regression discontinuity). Future primary preventive, participatory, organizational level interventions could benefit especially from the stepped wedge randomized design whereby the intervention is randomly applied to all groups but sequentially over time, or the multiple baseline design, which does the same although not randomly. Of course these designs pose their own challenges, such as the increased number of participants and measurement moments that are needed. In order to gather the most relevant evidence in intervention studies, researchers should consider beforehand the specific research question, the complexity of the intervention, the availability of existing data, the context, and the costs before choosing the most appropriate design.

The second methodological problem that was encountered was related to the design of the process evaluation. Because the field of process evaluation is rapidly developing we noticed that many different theoretical frameworks exist, which include many overlapping process variables. In order to understand what is the most relevant evidence with regard to the implementation process, a systematic literature review of 44 process evaluations of organizational level stress management interventions was conducted (chapter 7). The review demonstrated that there is indeed great heterogeneity in methods and process variables studied: among the 44 evaluations, 47 different process variables were found. Also a theoretical framework or program theory, which could guide the choice of process variables, was missing in half of the articles. Furthermore, the process evaluation data were mostly collected after the intervention took place, instead of also before and during the intervention. We concluded that a standardized framework including variables with regard to the intervention, participants’ mental models, and context factors would improve the theory development in the field of process evaluation for stress management interventions.

The main findings in context

The intervention study did not render the hypothesized results. This finding is placed in context starting with a comparison of the expert-based intervention studied in this thesis, with the evidence-based approach for decreasing work stress. In the sections following the comparison, explanations for the lack of results are presented related to employees’ behavior, and leadership and organizational culture. Lastly, the relation with participation is discussed.

Similarities and differences between expert-based versus evidence-based approach

The participatory, organizational level intervention (i.e. the Heuristic Method, HM) studied in the second part of this thesis was developed in practice, by a consultancy firm. HM consists of two phases: a needs assessment phase and a phase of implementing intervention activities. The phases are facilitated by an intervention facilitator: A representative participatory group is formed, thereby ensuring a fit between the organizational context and content and the process of the intervention. Even though developed, applied, and redeveloped in practice, the structure of the intervention is similar to the evidence-based psychosocial risk management approach [1-4]. The psychosocial risk management approach consists of five participatory steps that can be summarized as: 1) Preparation; 2) Screening; 3) Action Planning; 4) Implementation; and 5) Evaluation [4, 5].
A central common factor in HM and the psychosocial risk management approach is participation of the target group. Furthermore, steps 2 and 3 of the psychosocial risk management approach are similar to HM’s needs assessment phase, whereas step 4 is similar to the implementation of intervention activities phase.

The most prominent difference between HM and the psychosocial risk management approach is step 1, the preparation phase, which is not a formal element of HM. In the evidence-based approach, this step typically consists of: the formation of a steering group, ensuring senior management support, and communicating about the project [4]. Previous research has also demonstrated that employee and organizational readiness for change are important prerequisites [4], as a lack of employee and organization readiness for change is likely to influence intervention development, implementation, and effectiveness [6]. Readiness for change will more likely occur if participants perceive the current situation as undesirable and change as necessary [7, 8]. With regard to the intervention activities, participants need to believe they can benefit from it, and they need to be motivated to engage in it [7, 8]. The ‘preparation’ step is ideal for creating readiness for change, in practice however this step is sometimes reduced to installing a steering group, signing a declaration or contract stating higher management’s intended support, and sending a department-wide email about the intervention project. In the following paragraphs I will look back on the intervention study to argue that a more elaborate ‘preparation’ step can help to identify preexisting context conditions, which are indicative of (lacking) readiness for change. Impression from the research logbooks will be used as an illustrative starting point.

**Explanation 1: Employees’ participation hindered by learned helplessness**

**Impression 1:** The director and his secretary are welcome to attend the first fifteen minutes of a participatory group meeting, to jointly prepare an informative event with all employees wherein the intervention project will be presented. The director proposes an idea and does much of the talking, while the goal of the meeting was to get employees’ input for the event. The participatory group gets quieter and quieter. The arrangements are made quickly. When the director and his secretary have left after ten minutes, it turns out that the teachers completely disagree with the directors’ proposal for the event. They talk loudly and boldly.

To my question ‘why didn’t you state these objections earlier?’ they have no clear answer.

In this impression there are several players: the director (and his secretary), the participatory group, the intervention facilitator, and the researcher. The most important lesson to be learnt from this impression is probably in the interaction between the director and the participatory group. The group did not give their opinion in presence of the director, even though the whole purpose of him attending their meeting was for the group to give their opinion. Why? Because the director started the conversation with a concrete proposal, the participatory group might have felt little space to contradict his proposal, or they might not have been accustomed to disagreeing with a superior. To me as a researcher it reflected an unequal relationship, resembling the traditional teacher-student relationship: we will nod and say yes when he is watching, however if he turns to the blackboard we will throw paper balls at his head. The characteristics of the principal – teacher relationship have found to be important for teacher as well as student achievement [9, 10].

Another explanation could be that the teachers did not feel speaking up would matter, because they believed the director had already proposed something and that is how it will be executed, regardless of their opinion. This phenomenon could be explained using insights from (expanded) ‘learned helplessness’ theory [11, 12]. Learned helplessness is human behavior, characterized by refraining from responding to (and thus influence) an event, while it could have been controlled by our own actions [11]. Learned helplessness is also learned behavior, which originates after experiencing (an) uncontrollable event(s), and it can result in passivity, inability to learn that responding can be effective, and stress [11, 12]. How employees react to a felt lack of control varies with individual characteristics and with situations, it depends on an individual’s dominant perception, referred to as ‘explanatory style’ [13]. The explanatory style can be changed by cognitive behavioral techniques, by replacing unconstructive perceptions with more constructive perceptions [14].

I argue that employees in the educational sector experienced many uncontrollable events in the last decades, which has led to a degree of learned helplessness. In the international scientific literature on the organization of education, evidence has been found of several ‘uncontrollable’ events that have impacted the basis of the teaching profession. For example the increased student-teacher-ratio [14], the integration of students with special needs in regular classes [15], and the increase of accountability measures, which increased the administrative load [15]. This increased administrative burden has not only contributed to an expansion in the core tasks of a teacher, many teachers feel it also questions their professionalism. They perceive accountability measures as a series of mistrust measures, a control mechanism that limits their decision latitude (an important job resource). Australian research demonstrated that uncontrollable events have happened in the educational sector, for example the implementation of several (often even overlapping) school and school system reforms [16]. In the Netherlands, the Parliamentary Commission Dijsselbloem reached the same conclusion in 2008 after extensive research in the educational field, among policy makers, and schools [17]. The Commission found that the school and school system reforms had been planned with political support, but without satisfactory support in the educational sector. Probably because the union representatives who were involved in planning these reforms were closer to politics than to the field [17].
We have observed that if employees experience a degree of learned helplessness due to the experience of several uncontrollable events over time, it is difficult to give them ‘control’ in a participative intervention. In such case it seems not likely that the participative elements of an intervention will be implemented as intended and thus have the intended effects. In future participatory studies in education (and maybe also in other sectors that have experienced many events perceived as uncontrollable), researchers should be aware of the possible influence of learned helplessness on the intervention process. Ideally researchers get an impression of whether it is present in employees (and to what degree) during the first step of the psychosocial risk management approach, so that it can be either taken into account in the planned intervention or ‘unlearned’ before the planned intervention is implemented, by means of cognitive behavioral techniques. Cognitive behavioral techniques can help to structure and adjust employees’ misconceptions and faulty assumptions [18]. This is done by creating specific learning experiences, wherein employees firstly learn to recognize automatic, negative thoughts. Secondly they learn how these thoughts are related to their affect and subsequent behavior. And thirdly, employees learn to gather evidence for and against their automatic thoughts and to replace them with more balanced thoughts. The empirical evidence base for CBT as a helpful tool in changing cognitions in order to increase well-being, is strong [19].

The concept of learned helplessness is related to employees’ perceptions and appraisal, which is described as a second explanation for not finding the expected results.

**Explanation 2: Addressing employees’ perception and appraisal was not an intervention component**

**Impression 2:** In conducting the observations for the process evaluation I found that employees told each other (often faulty or misinformed) ‘stories’ about the intervention and the implementation process, such as: “nothing is changing, because the director opposes the change” or “we never see the intervention facilitator anymore because he was fired by the director for speaking up and telling him our wishes”.

During a working day employees continuously engage in sense making processes, they ‘perceive’ their environment and attribute meaning to it, that is they ‘appraise’ their situation [20]. This process continues when an intervention is being conducted within an organization, probably impacting the outcomes under study. Evidence for this sense making process was found by Nielsen and colleagues, when they assessed the role of employee appraisal of the intervention process in eleven intervention projects to reduce work stress in Denmark [21]. The researchers found full mediation of appraisal between exposure to the intervention and outcomes. More specifically, employees’ appraisal of intervention quality and their ability to influence the intervention mediated between exposure and outcomes (i.e. changes in working conditions, work stress, and job satisfaction). This example shows that employees’ appraisal can have a powerful influence in the intervention process.

In the medical and public health literature appraisal has been discussed mostly in terms of placebo effects. A placebo effect is observed as a patients’ health improvement after medical treatment without known active medical substance [22]. A negative placebo effect (a health deterioration after receiving medical treatment without known active medical substance) is called nocebo effect [22]. The nonspecific placebo treatment effect is often considered an interference, something we should control for with double-blind RCTs, instead of a beneficial intervention element [23]. Bensing and Verheul [23] have described three mechanisms through which placebo (or nocebo) work: conditioning, expectancies, and affect manipulation. I will describe how these three mechanisms are relevant with regard to employees’ perception and appraisal of organizational level, primary preventive occupational health interventions.

Firstly, participants can have either positive or negative previous experiences with interventions for work stress, which have resulted in a reduction of work stress (positive experience) or not (negative experience) [23]. Via classical conditioning, these previous experiences influence the results of future work stress interventions. In case of the negative experience, a neutral stimulus (e.g. the intervention) coincided with a negative outcome (e.g. feeling stressed). The formerly neutral stimulus (intervention) then becomes a conditioned stimulus, which is in itself enough to produce the negative outcome (feeling stressed). Occupational health research has demonstrated that if organizations failed to learn from previous, similar intervention projects, this will negatively impact participants’ perceptions of other interventions, as well as their willingness to participate in intervention activities [24, 25]. From this we can learn that in conducting an intervention we should always take previous experience with (an) intervention(s) into account, because participants’ conditioned responses to (the announcement of) an intervention can produce (unintended) outcomes in itself.

Secondly, expectancies of an intervention can result in a placebo effect, simply because the patient expects the intervention to lead to an effect [23]. While a conditioned response is unconscious, holding expectancies is a conscious process (e.g. “this time something really is going to change”) [23]. Expectancies can also exist on a group level, occupational health research has demonstrated that employees who work closely together can develop a shared way of perceiving and responding to events in the work context [26], and thus also respond similar to interventions in the work context [27]. Expectancies can become strong enough to overcome (negative) conditioned responses [28]. Timely, sufficient, and tailored communication plays an important role in shaping expectancies before, during, and after an intervention.

Affect manipulation, the third mechanism that can produce a placebo effect, works through patients’ conscious, subjective feeling (affective state), which
is influenced positively or negatively by how a treatment is applied [23]. Applied to work stress interventions, this would mean that how an intervention is conducted can be a positive or negative experience, which can result in consequent positive or negative feelings. This has indeed been demonstrated in organizational level primary preventive work stress interventions: the change process such an intervention implies can be perceived as stressful in itself by participants and thus cause negative effects [29]. Furthermore, medical research has demonstrated that the negative placebo or nocebo response is even stronger in patients who are already stressed or anxious [30]. Therefore, it seems important to make participation in an intervention a positive experience that induces a positive affective state, which then would increase the chance of a placebo effect. This is especially relevant in organizations where many employees are stressed.

Based on the findings of the current study combined with the insights from the placebo/nocebo literature, I argue that employees’ appraisal should be acknowledged as an influence in every occupational health intervention. More efforts should be directed to exploring and influencing employees’ appraisal upfront, by using the three mechanisms which are known to produce placebo effects, i.e.: recognizing conditioned reactions, shaping expectancies, and inducing positive affective states. Open-ended interviews or observations in the work context are tools for assessing what are current conditioned responses, expectancies, and dominant affective states with regard to the intervention. Tailored communication and making the intervention a fun experience can be tools for changing these elements.

Explanation 3: Leadership and organizational culture did not enable the (implementation of the) intervention

Impression 3: The advisory report stated the wishes, needs, and opinions of all employees in the intervention group, obtained by using a participatory process. Once the intervention facilitator has presented the advisory report to the Executive Board, their first reaction is to ask for an 'objective evaluation' of its content.

Since the content of the advisory report was the result of a participatory process, asking for a sort of ‘second opinion’, could also be interpreted as the implicit questioning of the employees’ perspective. In doing so, the Board actually disregards employees’ wishes, needs, and opinions. The example could be seen as indicative of a particular leadership style. A leadership style is a relatively stable pattern of behavior shown by a leader [31]. School principals leadership behaviors directly and indirectly affect teachers achievement, especially via the structuring of teachers working conditions [32]. A leadership style can be effective in one situation, but not in the other. In the above impression, an authoritarian leadership style seems to have been taken, which is characterized by controlling and top down communication, with little room for dialogue.

Chapter 8 General discussion

While style can have positive effects in chaotic situations (e.g. after a natural disaster [33]), this result is outnumbered by the studies wherein authoritarian leadership was associated with negative outcomes [31]. More specifically, in a lab study supervisor dominance was associated with lower perception of trust among teachers [34]. Whereas a dissertation in the educational field demonstrated that top management humility predicted teachers’ positive perceptions of leader effectiveness [35]. I argue that a leadership style that relies on dialogue, two way communication, and joint decision making – such as a facilitative, democratic, or transformational leadership style [9, 10] – would best suit a participatory intervention. If an authoritarian leadership style is present, it seems unlikely that organizational and employee readiness for a participatory intervention is high enough to conduct it successfully.

Leadership style is known to influence organizational culture [33] and vice versa. The following example of a middle management meeting demonstrates how top level management style has spilled over to the middle managers:

Impression 4: The (middle) management team asks the intervention facilitator to attend their meeting and again explain what will be done in step three of the interventions’ first phase, the group sessions with teams. The facilitator explains that the teams will work on formulating solutions to problems related to happy and healthy working. One manager states: how can we know that their solutions will be feasible? Another middle manager adds that he can already predict what solutions will be suggested by some teams. The conversation continues in this atmosphere until one middle manager exclaims: “It almost seems you have no confidence in the teams”. The others do not really respond to this, although they do say that they have no need for “grumpy group meetings”.

Impressions three and four characterize the relations between top and middle management, and employees. How management and employees relate to each other, to their work, and to the outside world has been defined as ‘organizational culture’ [36]. Hofstede and colleagues found that the core of an organizational culture is made up of employees’ shared perceptions of daily practices [36]. Daily practices are considered ‘the way things generally go in my organization’, or in the words of Hofstede and others: “conventions”, “customs”, “habits”, “mores”, “traditions,” or “usages” (p. 311 [36]). Based on impression three (top management perspective) and four (middle management perspective), it seemed to be managers’ shared perception that employees’ point of view is of limited value. This practice is in line with one of the two independent organizational culture dimensions that are associated with the management style of (top) leaders, that is the ‘Employee-Oriented vs. Job-Oriented’ dimension [36]. The dimension ranges from a primary concern for employees (characterized by statements such as “where I work, decisions are not centralized at the top”), to a primary concern for the work (characterized by statements such as “where I work, changes are imposed by management decree”) [36]. Participatory interventions (for work stress) probably fit best with organizations that are ‘employee-oriented’ rather than ‘job-oriented’. In the current intervention
study, the limited trust in the employees’ point of view was not indicative of an ‘employee-orientation’. Therefore, this probably hindered the implementation of the participatory intervention. Another intervention study pointed to a second reason for the importance of an ‘employee-orientation’ for the success of an intervention [37]. The researchers found that divisions higher in employee-orientation (referred to as ‘strong human relations values’) had higher levels of readiness for change pre-intervention, which predicted the post-intervention score on the outcome.

In conclusion, it has been described (in other settings) that elements of organizational culture can make (enable) or break (hinder) an intervention [38]. Shared perceptions of daily practices are at the core of organizational culture and can inhibit the intervention process as well as pre-intervention readiness for change. Future participatory, organizational level intervention studies should take the organizational culture into account, by trying to capture important cultural aspects in the preparation phase of the psychosocial risk management approach. This can be done by a mixed methods approach referred to as ‘qualitative orientation and quantitative verification’ [36], wherein interviews or observations are used to tailor questionnaires that are supposed to measure dimensions of organizational culture.

Determine the degree of participation in decision making that is feasible and suitable

I have described how the context factors (i.e. employees’ behavior and perceptions, leadership style and organizational culture) did not fit the participatory nature of the intervention described in this thesis. Nevertheless, stakeholder involvement in participation is considered an essential element in occupational health interventions, throughout the whole research process of intervention development, implementation and effectiveness study [39]. Participation is considered important because it can increase the support base for the intervention as well as the feasibility of intervention activities [40]. Furthermore, participating can be an empowering experience in itself [40]. A last reason for employee participation in decision making can be that it influences employee appraisal: being involved reduces the number of alternative explanations of a certain decision that will circulate in an organization [41]. In the literature on participation in decision making, a continuum of participation is distinguished with choice control at one end and voice control at the other end [42]. In a situation of complete ‘choice or decision control’ the participant directly influences the decision that is made, whereas in a situation of ‘voice or process control’ the participant can give his or her input on the problem formulation, gathering information, or defining alternatives. This process ends before the actual decision is made. In occupational health interventions both types of participation are encouraged [40, 43] and applied (for an example of choice control, see [44]; for an example of voice control, see [45]). In the organizational level intervention under study in this thesis, a degree of both choice and voice control was present. Choice control because of the participatory working group, and voice control in the formulation of problems and measures in the three steps of the needs assessment. Neither form of participation functioned really well in the current intervention. In organizations with adverse context factors for participation, some degree of ‘voice or process control’ might be the highest achievable. In preparing an intervention it seems relevant to consider what degree of participation in decision making is feasible and suitable for that specific organization.

A need for a more elaborate ‘preparation phase’

I have discussed how employees’ behavior and perceptions, as well as leadership style and organizational culture affected the implementation process directly, or indirectly via (lacking) readiness for change and failing participation. If we conduct a more elaborate first step in a psychosocial risk management approach (preparation), lacking readiness for change will be detected earlier and the context factors could be taken into account in the design of the intervention already. Elaboration of the first step in education could consist of: 1) assessing (by observations) and addressing (by cognitive behavioral techniques) learned helplessness, 2) recognizing conditioned reactions, shaping expectancies, and inducing positive affective states with regard to the intervention, 3) assessing cultural aspects (by mixed methods) that are indicative of leadership style (which preferably is democratic), and organizational culture (which preferably is employee-oriented).

Considerations

In the following paragraphs several considerations with regard to the methodology and findings of this thesis are presented.

Methodological difficulties due to the definition of work stress

Work stress is defined in different ways as exemplified by the meta-analytic finding that in 55 work stress interventions, 60 different outcome variables were used to measure work stress related determinants or outcomes [46]. Following this finding, it is concluded that work stress is considered multifactorial in its causes and consequences. Due to the multifactorial nature, the choice of suitable outcome measures is difficult. Three such difficulties are described hereafter, that is: stress as the result of an imbalance between job demands and job resources; stress as a stage in a process rather than a definite outcome; and the measurement level of stress.

Most work stress models are based on a ‘balance’ idea, in short: work stress can arise if job demands outweigh job resources. In both the cohort study (chapter 2) and the intervention effectiveness study (chapter 4), we measured several job demands and job resources, but we did not combine them in order to determine whether a balance or imbalance was present. Instead, we used a burnout
measure and two proxies of work stress (i.e. need for recovery and vitality) in order to determine whether the intervention and control group had stress complaints or not. Few studies have tried to capture the imbalance in itself. If we still believe work stress is the result of imbalanced demands and resources, we might try to calculate the imbalance in order to develop a more sensitive measure of work stress determinants. More advanced statistical techniques could make this possible. Jenny and colleagues [47] did an interesting attempt and computed a ratio between demands and resources, which was then related to outcomes such as burnout.

The second difficulty is that stress is a stage in a process rather than one definite outcome. Evaluations of work stress interventions could take the stress process into account by means of developing a logic model of expected changes, wherein proximal, intermediate, and distal effectiveness outcomes are distinguished [48, 49], instead of only distal outcomes. Proximal outcomes have been described as those effects that arise immediately, whereas intermediate effects concern changes in factual processes (e.g. changes in resources-demands ratio, the work organization, supervisor behavior) and social processes (e.g. changes in collaboration), and distal effects are psychosocial health outcomes [48].

The third difficulty is related to the measurement level. The measurement level of the intervention (organization) differed from the measurement level of the outcomes (individual) in the effectiveness study in this thesis. The only organizational or ‘collective’ outcome measure was organizational efficacy (i.e. ‘an individual’s perception of the general capabilities of an organization’ (p.127, [50]). This might be a suboptimal way of trying to capture the intervention effect, which might also contribute to an erroneous conclusion that the intervention did not render an effect (i.e. type II error). In future studies the measurement level of intervention and measures should preferably be kept the same by (at least) including constructs at the group level, such as team level performance, aggregated sickness absence registration data, or an assessment of interpersonal relations. Ideally, an analysis can be based on a combination of self-reports and organizations (or even societies) routinely collected data.

Overlap between definitions organizational level intervention and primary preventive intervention

Organizational level interventions for work stress are defined as follows: “Planned actions designed to reach relatively large groups of individuals in a relatively uniform way by changing the way work is designed, organized or managed” (p.220, [51]). This definition overlaps with the definition of primary preventive interventions for work stress: “primary intervention aims to prevent the incidence of work-related mental health problems; it is ‘work-directed’ aiming to reduce job stressors at their source by modifying the job or the work environment” (p.3, [52]; [53]). The classifications seem to have been used interchangeably in the literature, which can cause confusion about the interventions under study, the most suitable study design, and most appropriate outcomes. Because, by (these) definition(s) organizational level interventions are always primary preventive, whereas primary preventive interventions are always conducted at the organizational level. I believe this classification is not completely justified, because organizational level interventions can also be secondary (or even tertiary) preventive (e.g. offering all managers a coaching course to teach them how to recognize stress symptoms), whereas primary preventive interventions can also be applied at the individual level (e.g. tailored coaching to prioritize tasks and thus manage job demands or utilize job resources). The ‘individual/organizational level’ distinction should be used for the interventions’ level of application, and ‘primary/secondary/tertiary’ for the target group and its health status. Following this line of reasoning, it might be useful to further specify the ‘individual/organizational level’ distinction into four levels, as has been proposed in the organizational change literature [54] and used in the context of restructuring interventions [55]: 1) interventions directed at the individual, 2) interventions aimed at a group (e.g. team or department), 3) interventions targeting the managers or supervisors, and 4) interventions involving changes in organizational procedures and practices. The last parts of the definitions (i.e. “changing the way work is designed, organized or managed” and “reduce job stressors at their source by modifying the job or the work environment”) relate to the intervention strategies that are applied, which typically include changing (i) task characteristics, (ii) working conditions, and (iii) social conditions [56]. Creating more clarity about the intervention’s level of application, the target group and its health status, and the intervention strategies applied will make it easier to choose the most suitable study design and appropriate outcomes.

Primary preventive intervention applied in a situation that required secondary prevention

The HM intervention (chapter 3-5) was presented to the schools as an organizational level primary preventive intervention, which is an intervention to eliminate the sources of stress by changing the way work is designed, organized, or managed. A study among 81 organizations demonstrated that those organizations with low levels of stress and balanced demands and resources had the best chance of successfully developing and implementing interventions [57]. However, both schools wanted to participate in the intervention project because work stress was already present in the intervention departments (amongst other problems). Because a substantial amount of employees already suffered from work stress at baseline, this might have led to employees’ unreasonably high expectations of the possible effectiveness and scope of the intervention, as was found in earlier work stress interventions [58]. In the literature it has been proposed that primary and secondary preventive interventions should be combined in order to promote the positive and prevent harm, respectively [52]. Based on the current thesis I would like to add the nuance that such a combination indeed seems a good idea, however this should be done sequentially rather than simultaneously in highly stressed organizations. I believe it is not likely that a participatory, primary preventive, organizational
level intervention (that aims to alter the sources of stress at work by changing
the way work is designed, organized or managed) will lead to a stress reduc-
tion in organizations that are stressed already. In these organizations, stressed
employees and managers should rather be offered a secondary preventive in-
tervention first (that aims to help individuals or groups cope effectively with
existing stressors). Addressing the existing work stress complaints at both
employee and middle manager level first, might create an atmosphere of read-
iness for change, after which the stressors at their source can be changed more
efficiently and maybe even effectively. This order of intervening might prepare
employees and managers for the change process that a primary preventive,
organizational level intervention implies and shape their expectancies. Partici-
pating in a secondary, coping intervention requires employees’ development
of meta-analytical skills with regard to one’s own thoughts, affects, and behav-
iors. Developing these skills might also prepare employees for their participat-
ing role in a primary intervention, which can be a new experience in sectors
and organizations not used to shared decision-making.

Recommendations

In this section I formulate recommendations for future practice and research,
by describing that conducting primary preventive, organizational level inter-
ventions often implies a change process, and by exploring how to meaningfully
combine process and effect measures.

Recommendation for practice: A primary preventive, organi-
zational level intervention is a change process that should be
managed as such

Based on the experience with the intervention in this thesis I believe that con-
ducting an organizational level, primary preventive intervention often implies
managing an organizational change process, because the intervention activ-
ities are (by definition) changes in how the work is organized, designed, or
managed. Change processes in organizations generally tend to be tough be-
cause they are slow [59], and fail often or make things worse [60]. But fore-
most they are hard because organizations are dynamic rather than static [61],
and requirements of intervention activities could change almost on a day to
day basis especially in ‘stressed organizations’. Several recommendations can
be formulated for practice, for example for intervention facilitators, HR-profes-
sionals, middle managers, and top level managers in schools and other organi-
sations, to manage the change process.

- Conduct an elaborate preparation phase prior to starting the change process
  (the implementation of the intervention), to identify preexisting context
  conditions, which could be indicative of (lacking) readiness for change. Es-
  pecially:

- Capture (by observations or recollection of previous experiences) and
  change (by cognitive behavioral techniques) what particular negative au-
tomatic thoughts employees might have with regard to the intervention.
- Shape expectancies by timely, adequate and tailored communication
  about the intervention. Induce positive states by making the intervention
  a fun thing to do.
- Assess cultural aspects (by mixed methods) that are indicative of lead-
ership style (which preferably is democratic), and organizational culture
  (which preferably is employee-oriented).
- Look before you leap. Starting the change process but aborting it halfway
  (or after problem definition or action planning), is the most efficient way
  to make the change fail, and possibly future change processes as well. It is
  furthermore detrimental for the trust between managers and employees.
  Employees might learn that they are not taken seriously and they will be-
  come more cynical towards future changes.
- Design participation in a manner that suits the organizational context. The
  change process needs to be a participatory effort of both employees and
  staff. If employees might have difficulties with their participating role, ef-
 forts should be directed at making sure they could participate well. If man-
agement or supervisors might have difficulties with employees’ participa-
tion, efforts should be directed at changing this attitude.

Recommendation for research: combine process and effect
outcomes

The importance of measuring the implementation process in intervention
studies is increasingly recognized (e.g. [51]). An evaluation of the implementa-
tion process is often conducted in a separate process evaluation analysis,
alongside a (randomized) trial, in order to answer research questions such as
‘what factors hindered and helped the implementation?’. The analysis typical-
ly relies on both qualitative (e.g. interviews) and quantitative measures (e.g.
questionnaires), which are operationalized according to common implementa-
tion models such as Steckler and Linnan [62] or RE-AIM [63]. Reports of
the effect and process analyses are often provided in different articles, there-
by complicating the possibility to integrate the findings from the separate
analyses. An example of such a process evaluation is the implementation of
a worksite social and physical environmental intervention in order to reduce
need for recovery (amongst other variables) [64].

Researchers have pointed to the relevance of combining both process and out-
come variables [51]. Combining these measures supposedly leads to a greater
understanding of what works for whom under which circumstances. Whereas
many have pointed to the relevance of this type of research, not many have
tried to do this: only 39 of the 84 studies (46%) included in a review on pro-
cess components in stress management interventions [65].
Nevertheless, some examples of combining process and effect measures in intervention evaluations are present in the literature. In the following I will use some of these intervention evaluations as illustrations of ways to further explore the combination of process and effectiveness variables in future studies. These explorative ways are: (i) subgroup analyses wherein allocation to subgroup is based on process data, (ii) studying an implementation component as a predictor of the effectiveness outcome, (iii) integrating process and effect measures. The statistical procedures applied differ, although the type of research is the same. The three ways are thus considered variations on the same theme.

Firstly, researchers have conducted regular subgroup analyses, in epidemiology also referred to as per protocol analyses (i.e. comparing that part of the intervention group that followed the intervention protocol more rigorously, to the control group). If a small effect of the intervention exists, it would be found more easily in a group that received a ‘higher dose’ of the intervention. For example, in a pragmatic RCT of a web-based intervention aiming to empower disability claimants it was found that 33% of the target population did not even log onto the website [66]. Therefore, per protocol analyses were performed, comparing subgroups of participants who used the intervention for more than 1, 2, 3 or 4 hours, on all outcomes [67]. The researchers found significant dose-response relationships for context-specific empowerment, knowledge, coping, and claimant’s active participation. The strength of the relationship increased with the hours spent on the intervention. Also in the current thesis, per protocol analyses showed a significant effect on occupational self-efficacy among those participants in the intervention group who received a higher dose of the first phase of the intervention, indicating that an intervention effect might have been found if the dose would have been high enough for all participants.

Secondly, researchers have used implementation components as a predictor of the primary outcome in two manners: 1) using the intervention dosage as a predictor, 2) using another specific known process component as a predictor.

As an example of the first manner, the effect of a problem solving intervention delivered by occupational physicians and targeted at employees who returned to work after experiencing common mental disorders was tested in a cluster RCT design [68]. The primary effect outcome was the incidence of recurrent sickness absence (yes/no). The process components of the Steckler and Linnan model [62] were assessed, and participant and physician satisfaction with the intervention was added. The researchers combined process and effect variables by conducting multilevel logistic regression analysis with recurrent sickness absence as dependent variable and participation in each of the intervention components as independent variables. The analyses showed specific effects for specific groups: a lower risk of recurrent sickness absence was found among participants who participated in two specific intervention activities (i.e. filling out the problem solving inventory and having discussed with the physician how to realize work opportunities). A higher risk was found among participants who participated in only one specific activity (i.e. the problem solving inventory). Participating in more elements of the intervention per se did not result in a larger effect on the primary outcome.

As an example of the second manner, researchers quantitatively assessed specific known implementation components to assess variance in the outcomes under study [69]. The components were all related to perception or appraisal of the implementation process, the importance of which has been described earlier (paragraph ‘main findings in context’). More specifically, in a teamwork intervention in a Danish elderly care setting, Randall and colleagues [69] used employee perceptions of participation, line manager attitudes and actions, perceived exposure, and readiness for change to explain variance in the outcomes (i.e. self-efficacy, job satisfaction, well-being). Regression analyses demonstrated firstly that line manager attitudes and actions were associated with higher post-intervention levels of self-efficacy and job satisfaction. Secondly, employee readiness for change was associated with higher levels of self-efficacy and intervention history was associated with job satisfaction. All betas were in positive direction, indicating that more positive appraisals of the process were related to more positive outcomes. This could be a ground for measuring these process components upfront, in order to either adapt the planned intervention or to conduct another intervention first (namely increasing line manager attitudes and actions, or employee readiness for change).

Thirdly, researchers have integrated process and effect measures. In a Swiss primary intervention to reduce stress among 1400 workers in eight diverse medium and large sized companies in industry and services, participants were asked (among many other variables) to retrospectively assess the impact the intervention had within their organization [47]. This ‘impact assessment’ of the intervention was then related to longitudinal changes in the ratio between job resources and job demands, the (proximal) intervention outcome. Then the intervention participants were, again retrospectively, assigned to the high impact subgroup or the low/medium subgroup. Repeated General Linear Model analyses showed that those who appraised the intervention as having had ‘high impact’ within the organization, also improved or maintained a certain positive resources/demands ratio after two years. The one exception to this general finding were managers who already had a favorable resources demands ratio.

Looking over these options, I believe the first can be quite easily applied to ongoing intervention studies, or even in studies that have finished already. The second option would require more literature research in order to formulate specific hypotheses upfront, and it furthermore requires good, validated measures (which could be based on for example Randall, Nielsen and Tvedt’s Intervention Process Measure [20]). The third option is interesting because it also dealt with one of the definition problems with regard to stress (a possible result of an imbalance between job demands and job resources) by computing a ratio. I conclude that several options for combining process and effect data exist, and are feasible to apply. However, a systematic review on complex social interventions...
found that the quality of reporting of implementation variables was often poor and anecdotal [70], which makes the combination of process and effect difficult. Adequate reporting of implementation variables deserves more attention in research. Ideally, process components are measured upfront as part of an elaborate preparatory phase, in order to either adapt the planned intervention or to conduct another intervention first (e.g. increasing line manager attitudes and actions, and employee readiness for change). Conducting combined effect-process analyses can help to obtain better interventions, smoother intervention processes, and disclosure of the ‘black box’ of intervention mechanisms.

General conclusion

The main objective of this thesis was to explore ways to decrease work stress in teachers from an individual, organizational and intervention evaluation perspective.

From an individual perspective work stress in teachers might be decreased by addressing mastery in secondary preventive, individual level interventions by using cognitive behavioral techniques, although this finding requires replication and experimentation.

From an organizational perspective work stress cannot be decreased by the currently applied participatory, primary preventive, organizational level intervention. The intervention was ineffective in reducing (determinants of) work stress. Furthermore, the implementation process of the intervention was hindered by an insufficient implementation strategy for the intervention activities, insufficient communication, and unexpected events. It was argued that employee and organizational readiness for change was low, due to employee learned helplessness, employees’ negative appraisal of the intervention, an authoritarian leadership style, and an organizational culture low in employee-orientation. These characteristics also did not fit the nature of a participatory intervention. Future interventions of this type should conduct a more elaborate preparatory step, as to establish these factors beforehand.

The most relevant evidence in intervention studies can be obtained by gathering both effect and process data. The most relevant effect data are obtained when researchers consider beforehand the specific research question, the complexity of the intervention, the availability of existing data, the context, and the costs and then choose the most appropriate research design. Other designs than the RCT are available and feasible, of which the stepped-wedge randomized trial and the multiple baseline design seem especially suitable to primary preventive, organizational level interventions. Although every research design poses its own challenges, such as the increased number of participants and measurement moments that are needed. The most relevant process data are obtained based on a framework that includes variables related to the intervention, participants’ mental models, and context factors. Ideally, process and effect data are combined in several subanalyses.

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