A multiple case study approach to work stress prevention in Europe

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Work stress has become a major issue among European employees. The current practice of its prevention seems disappointing, as work stress prevention programmes are predominantly reactive and biased to the individual. The lack of organization-level intervention studies is a barrier to progress in reducing work-related stress. In addition to the “true experimental approach”, multiple case studies may provide an adequate research strategy for addressing the potential impact of stress interventions in organizations. The study aim was to obtain more knowledge with respect to evidence-based work stress prevention in Europe, by focusing on both content (cause–effect relationships) and process (“how”). Therefore it was decided: (1) to collect from each European Union member state a work stress intervention study; (2) to analyse each of these cases as to content and process factors; and (3) to systematically compare these studies in a step-by-step approach. Through a network approach, 11 cases were identified. Nine projects received an acceptable methodological standard and were included in this study. Evaluation of these cases reveals that stress prevention is no “one time event”, nor merely a technical process. It is concluded that “true prevention” (i.e., preventive measures that are based on an adequate diagnosis identifying risk factors and risk groups, which theoretically and logically fit in with the problems, and which are introduced and implemented in a proper way) may be beneficial to both the employee and the organization.
Due to the changing context and nature of work, work stress has become a common phenomenon for a growing number of European employees (Geurts & Gründemann, 1999). An extensive survey among a representative sample of 15,800 workers from 15 European Union member states (Paoli, 1997), revealed that 28% of the European work force reported work-related stress complaints, and 20% reported overall fatigue as a work-related health problem. When comparing the results of this survey with a similar study five years earlier (Paoli, 1992), time constraints in particular have increased sharply: A growing number of European workers are spending most of their working time performing high-speed work (35% in 1991 and 43% in 1996) and work with tight deadlines (1991: 38%; 1996: 45%). With the exception of Germany and Greece, this increasing work pace is perceived in all European Union member states. The highest number of workers to experience high-speed work is found in the Netherlands. The study by Paoli (1997) further showed that at present for the majority of workers (67%) the work pace is dictated more by customers and clients than by machines (22%). This directly relates to the growing number of workers in the service sector (59% in 1991; 63% in 1996).

Stimulated by this increase in work stress and by the introduction of the European Framework Directive on Safety and Health of Employees at Work (12 June 1989), there is an increasing interest at governmental level (both national and European) in reducing workplace absenteeism and work disability due to adverse (psychosocial) working conditions and work stress (Geurts & Gründemann, 1999; Gründemann & Van Vuuren, 1997). In 2000, for example, the European Commission will issue “Guidance on Work-Related Stress”. On a global level as well, it has been widely recognized that improving the psychosocial work environment may be an important step in improving employee health and organizational productivity (Griffiths, 2000; WHO, 1999).

Given the impressive body of knowledge that demonstrates adverse health effects of certain (combinations of) psychosocial work characteristics (e.g., Cox, 1988, 1993; Karasek & Theorell, 1990; Marmot, Siegrist, Theorell, & Feeney, 1999; Quick, Quick, Nelson, & Hurrell, 1997; Schaufeli & Enzmann, 1998; Siegrist, 1998; Uehata, 1991), and given the legal emphasis on risk assessment and risk management (“rooting out the risks”), one might expect a flourishing field of research into organizational-level stress interventions, i.e., studies that aim at changing work in order to make it less stressful. This, however, is not the case. There is a large gap between theory and practice, as follows from an overview of the last two decades in the field of work stress prevention, that is, after the pioneering work of Newman and Beehr (1979). Based on the literature (see e.g., Cooper & Payne, 1998; Cox, 1993; DeFrank & Cooper, 1987; Kahn & Byosiere, 1992; Kompier, Geurts, Gründemann, Vink, & Smulders, 1998; Murphy, 1986; Van der Hek & Plomp, 1997), six interrelated conclusions may be drawn (Kompier & Kristensen, in press):
(1) Occupational stress is a rapidly expanding field and so is occupational stress management. There is a great deal of activity.

(2) “This activity is concentrated disproportionally on reducing the effects, rather than reducing the presence of stressors at work” (Kahn & Byosiere, 1992, p. 623). Stress reduction is primarily a “band aid approach”.

(3) Related to this, the main target is the individual employee rather than the workplace or the organization. Most programmes aim at the reduction of the cognitive appraisal of stressors and their subsequent effects, rather than at the reduction or elimination of the stressors themselves.

(4) The majority of stress management programmes has a “one size (or one pill) fits all” character. Many practitioners offer sovereign remedies regardless of the presenting symptoms (Kahn & Byosiere, 1992), which stands in the way of a systematic risk assessment (“stress audit”, “stress analysis”) identifying risk factors and risk groups. Such a systematic analysis is often lacking in stress intervention studies.

(5) There is a lack of evaluation research, and of strong designs in evaluation research. Many interventions are not evaluated in a systematic way, and, in case of evaluations, study designs are often characterized by serious methodological flaws.

(6) Finally, the role of contextual and process variables, such as the introduction and implementation of measures receives insufficient attention in evaluation research and in the literature. The “true experimental approach“—with its emphasis on control over important variables, on the random allocation of subjects to treatment or control groups and on identifying causal connections between treatment (interventions) and effect—focuses attention on “outcome” at the expense of “process” (Griffiths, 2000). To elaborate on this final conclusion, we have to take into account that in organizations stress interventions are “social experiments”, in which researchers are guests, not autocrats, and wherein causal relations are not simple but embedded within complex contexts (Griffiths, 2000, p. 590).

In these contexts people have ambitions, attitudes, preferences, and individual and collective interests. These contexts influence relations between interventions and outcomes. Traditional stimulus–response schemata do not take into account that the “people under study” (employees, supervisors, managers) are not passive study objects, but active organizers of their own working situation (Kompier & Kristensen, in press). Stress intervention research that focuses exclusively on the relations between stimuli and responses (i.e., interventions and outcomes) limits our understanding of the (impact) of stress interventions in field settings. In the same vein, Goldenhar and Schulte (1994) conclude that the complexity of phenomena in occupational health intervention studies also means that intervention researchers should focus more on the process and the milieu of an intervention and not only on the outcomes (p. 770). With respect to work
redesign, Parker and Wall (1998), while reviewing key issues for future research, arrive at a comparable conclusion: “To this point we suggest a greater use of qualitative approaches to allow a better understanding of the complex, and often highly political, dynamics that are involved in work redesign. We also advocate the wider reporting of “process issues” (in most published work design studies, the focus is on outcomes rather than process)” (p. 137). In a similar vein, Ovretweit (1998), while discussing the evaluations of health interventions, concludes: “Traditional experimental evaluation design is not well suited to investigating social systems or the complex way in which interventions work with subjects or their environment” (p. 99).

Given this somewhat disappointing present status of the core of stress intervention research, it is still hard to provide answers to questions such as: Does work stress prevention work? Which programme types and components are effective, and which are not? Why do certain components work? And, how do they work, i.e., by which underlying mechanisms? Which are intended and unintended side-effects? What are costs, benefits and limitations? What are stimulating and obstructing factors? This present situation is well summarized by Griffiths, Cox, and Barlow (1996): “The lack of evaluation of such interventions is a major problem and a significant barrier to progress in reducing work-related stress” (p. 66).

A valuable research strategy to diminish this barrier is to collect data before and after some relevant change or intervention in the work situation (e.g., Parkes, 1982). As Kasl (1978) and Parkes (1982) emphasized, longitudinal studies of this type, designed as natural experiments around significant events and transitions, are more likely to throw light on causal relationships than are cross-sectional studies of stable work environments. Still, such natural experiments face their own threats to internal validity (such as history, maturation, selection, testing, statistical regression, mortality, competition by people receiving no treatment, and diffusion of treatments), and to external validity (e.g., interaction of selection and treatment) (see, for an overview, Beehr & O’Hara, 1987; Yin, 1994).

Methodologically, this study approach fits in the tradition of the multiple case study (Yin, 1994). The case study has long been stereotyped as “a weak sibling among social science methods” (Yin, 1994, p. xiii). This is not correct. A multiple case study approach is the adequate research strategy “when how and why questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context” (Yin, 1994, p. 1). The study of the impact of occupational stress interventions fits this definition, with occupational stress being the “contemporary phenomenon”, and with “how or why” questions that are posed with respect to its prevention. In terms of Yin’s definition, the organization is the “real-life context”, in which stress researchers are guests with restricted “control over events”, since interventions take place in a dynamic and often quickly changing context.
In multiple case studies, research data can be treated cumulatively. Multiple cases should be considered as multiple experiments or multiple surveys (i.e., follow a replication logic), instead of as multiple respondents in a survey (Yin, 1994). Accordingly, the method of generalization is “analytic generalization” and not “statistical generalization”. In statistical generalization, inferences are made about a population on the basis of empirical data collected about a sample. Cases do not represent a “sample”: They are generalizable to theoretical propositions and not to populations. Such a theoretical proposition, for example, is that increasing job control will reduce health complaints, or that the introduction of team-based work will increase the motivation for learning new behaviour patterns and productivity. This research strategy has also been characterized “plausible rival hypothesis” (Campbell, 1994), and is quite similar to principles used in criminological investigations (Yin, 1994). As for the court, in stress intervention research “full proof” of (causal) relationships, for example regarding the relationship between work redesign and sickness absenteeism, is hard to give. The essence of “plausible rival hypothesis” is that a researcher, similar to a prosecutor or lawyer, systematically brings up arguments and draws conclusions with respect to plausibility by searching for converging (e.g., triangulation) and diverging evidence (i.e., competing causes or artefacts that may otherwise account for the observed outcomes; see also Beehr & O'Hara, 1987, p. 82; Zapf, Dormann, & Frese, 1996, p. 147).

Summarizing, we have argued that (1) work stress has become a major issue among European employees; (2) the current practice of its prevention seems disappointing, as work stress prevention programmes are predominantly reactive and biased to the individual; (3) the lack of organizational-level intervention studies is a significant barrier to progress in reducing work-related stress; (4) the “true experimental approach” is very difficult to transfer to the practical reality of modern quickly changing organizations and tends to focus attention on outcomes at the expense of process; and (5) in addition to this “true experimental approach”, multiple case studies may provide an adequate research strategy for addressing the potential impact of stress interventions in organizations.

Hence the major purpose of this study is to contribute to both stress research and practice by reducing the gap between both fields. More in particular the study aim was to obtain more knowledge with respect to evidence-based work stress prevention in Europe, through the study of multiple cases in prevention by focusing on both content (cause–effect relationships) and on process (“how”). Therefore it was decided:

1. to collect from each European Union member state a work stress intervention study
2. to analyse each of these cases as to content and process factors
3. to systematically compare these studies, in a step-by-step approach.
METHODS

Selection of cases

We tried to find (teams of) national experts in occupational stress and its prevention in all European Union member states, with the exception of Luxembourg. Through a network approach (teams of) national experts were identified in 14 countries: Finland, The Netherlands, Belgium, United Kingdom, Denmark, Sweden, Germany, Ireland, Portugal, Greece, Italy, Austria, France, and Spain. Each of the (teams of) national experts was asked to identify and present a national case study in stress prevention. Specialists from Austria, France, and Spain could not identify and present such a case study. This resulted in 11 case studies. Selection criteria for inclusion in the present study were:

1. A prevention and intervention programme had to be carried out.
2. Cases should meet a minimum methodological standard. We followed the research design rating proposed by Murphy (1996), who differentiated between five research design ratings:
   a. evidence that is descriptive, anecdotal or authoritative (*)
   b. evidence obtained without intervention but that might include long-term or dramatic results from general dissemination of information or medical agent into a population (**)
   c. evidence without a control group or randomization, but with an evaluation (***)
   d. evidence obtained from a properly conducted study with a control group but without randomization (****)
   e. evidence obtained from a properly conducted study with a randomized control group (*****).

In this study, a three-star (*** design rating (one-group pre-test–post-test design; Cook & Campbell, 1979) was considered a minimum standard.

The case reports from Portugal (Graca & Kompier, 1999) and Greece (Petsetaki, 1999) did not meet this second demand. Table 1 lists the nine remaining cases that will be reported upon in this study.

Analysis

All cases were compared in a step-by-step approach (Cox, 1993; Kompier & Marcelissen, 1990) on the basis of detailed written reports by national specialists (Kompier & Cooper, 1999). For each case, in order to find out “why, what, when was done by whom”, the following questions were answered with respect to both content and process:

   Step 1: Preparation
   • What were the motives for the project?
TABLE 1
Overview of nine European cases (country, company, authors)

<table>
<thead>
<tr>
<th>Country</th>
<th>Company</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>Forest industry</td>
<td>Kalimo &amp; Toppinen (1999)</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>Hospital</td>
<td>Lourijsen, Houtman, Kompier, &amp; Gründemann (1999)</td>
</tr>
<tr>
<td>Belgium</td>
<td>Pharmaceutical company</td>
<td>Poelmans, Compernolle, De Neve, Buclens, &amp; Rombouts (1999)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Public sector</td>
<td>Whatmore, Cartwright, &amp; Cooper (1999)</td>
</tr>
<tr>
<td>Denmark</td>
<td>Bus company</td>
<td>Netterstrom (1999)</td>
</tr>
<tr>
<td>Sweden</td>
<td>Mail sorting</td>
<td>Theorell &amp; Wahlstedt (1999)</td>
</tr>
<tr>
<td>Germany</td>
<td>Hospital</td>
<td>Beermann, Kuhn, &amp; Kompier (1999)</td>
</tr>
<tr>
<td>Ireland</td>
<td>Airport management company</td>
<td>Wynne &amp; Rafferty (1999)</td>
</tr>
<tr>
<td>Italy</td>
<td>School of nursing</td>
<td>Bagnara, Baldasseroni, Parlangeli, Taddei, &amp; Tartaglia (1999)</td>
</tr>
</tbody>
</table>

- How was the project organized?
- Were external agents involved (e.g., consultancy or research activities)?
- What was the duration of the project?

Step 2: Problem analysis
- What instruments were used to identify risk factors and risk groups?
- What risk factors and risk groups were identified?

Step 3: Choice of measures
- What measures (work directed, person directed) were selected and why?

Step 4: Implementation
- How were these measures implemented? Who was responsible?

Step 5: Evaluation
- What were (subjective, objective) effects of the programme?
- What were costs and benefits of the project (e.g., in terms of finances, productivity)?
- Which were obstructing factors?
- Which were stimulating factors?
- Was there a follow-up?

RESULTS

The Appendix provides an overview of the nine cases.

Step 1: Preparation

In two cases (The Netherlands and Sweden) high absence figures formed the starting point of the project. In these cases sickness absenteeism was presumed to be a result of a high psychosocial and musculoskeletal workload. Among the consequences of high absence rates were high costs, inefficiency in the organization of work, disturbances in work processes, and a decreasing social climate.
In addition to these so-called “internal” motives, also “external” motives played a role, such as shortages at the labour market. For example, the Dutch hospital explicitly chose to transform to a “better than average hospital” in order to be more appealing for new personnel. Other main motives for starting these projects were: paying attention to “human capital”, prevention of work-related health problems, prevention of stress symptoms, promotion of workers' health, jointly improving working conditions and productivity, finding out whether there was a stress problem, and providing more social support to the staff (see Appendix).

Various organizations, especially the large-scale projects in Finland, The Netherlands, and Belgium, installed a project-structure (project group or steering committee) on a temporary basis. Such a project group formed a representation of the most important organizational “parties”, such as management, middle-management, and employees. In all cases, however, management remained responsible “for the chain of events”, and often chaired the meetings. In several projects (Finland, The Netherlands, Denmark, Sweden, Germany, and Ireland), a basic assumption was that employees whose “work was in discussion” needed to have an important role in the execution of the project. In eight projects (Finland, The Netherlands, Belgium, United Kingdom, Sweden, Germany, Ireland, and Italy) external consultants or researchers, mostly from a university, were involved. Especially in Sweden, an active role was played by the occupational health service.

**Step 2: Problem analysis**

A wide range of instruments was used in order to assess risk factors and risk groups. Most projects combined several instruments, ranging from simple instruments used for “first line monitoring” (e.g., checklists and interviews) to more sophisticated “professional” ones. Examples of the latter were instruments for task analysis and a psycho-physiological study in the Finnish study, and an instrument for analysing work organizational processes in the Dutch study. Also questionnaires and analyses of administrative data (such as sickness absenteeism, turnover, work disability) were used. In identifying risk factors, four companies (Finland, The Netherlands, Germany, and Ireland) differentiated between factors that affect the organization as a whole, and factors that affect one or more specific departments or groups of employees. Accordingly, risk groups were mostly defined in terms of specific departments or positions, or involved all employees in the organization (for example, United Kingdom, Denmark, Italy). Such an approach may enable a company to make an assessment of its relative position (compared to “the average employee” and to specific norm-scores of the branch), and to make internal comparisons between departments or groups in the organization (on the basis of age, gender, blue versus white collar, and so on), otherwise known as “benchmarking”.

Step 3: Choice of measures

Table 2 provides an overview of work-directed, person-directed, and other measures from the nine projects. Among the work-directed interventions are work redesign (e.g., job enrichment, introduction of self-regulating teams), changes with respect to work and resting time regulations (e.g., shift systems), social support (e.g., changes in information flow and communication), and ergonomic and technological actions. The most important person-directed interventions relate to training of employees and of management. In the Belgian project, for example, there was an obligatory training for managers in “people management”, and a training course “coping with stress”. Furthermore, managers were trained in ergonomics.

As demonstrated in the Appendix and Table 2, seven cases (Finland, The Netherlands, Belgium, Denmark, Germany, Ireland, and Italy) explicitly decided on the combination of work-directed and person-directed measures. One case (United Kingdom) “only” opted for person-directed measures, whereas another case (Sweden) “only” addressed work-directed measures.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Most important interventions, nine projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td><strong>Project</strong></td>
</tr>
<tr>
<td>Work directed</td>
<td></td>
</tr>
<tr>
<td>* Work redesign</td>
<td>Finland, The Netherlands, Denmark, Sweden</td>
</tr>
<tr>
<td>* Working time schedules</td>
<td>The Netherlands, Denmark, Sweden, Ireland</td>
</tr>
<tr>
<td>* Improved social support</td>
<td>Sweden, Germany, Italy, Ireland</td>
</tr>
<tr>
<td>* Ergonomics and technology</td>
<td>The Netherlands, Belgium, Germany</td>
</tr>
<tr>
<td>* Small increase in staff</td>
<td>Sweden</td>
</tr>
<tr>
<td>* Changes in interior climate</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Person directed: human resources management and training</td>
<td></td>
</tr>
<tr>
<td>* Training</td>
<td>Finland, The Netherlands, Belgium, Denmark,</td>
</tr>
<tr>
<td></td>
<td>United Kingdom, Germany, Ireland</td>
</tr>
<tr>
<td>* Training of management</td>
<td>Finland, The Netherlands, Belgium, Ireland</td>
</tr>
<tr>
<td>* Promoting healthy life style</td>
<td>The Netherlands, United Kingdom, Ireland</td>
</tr>
<tr>
<td>* Training modules personal stress awareness, cognitive restructuring</td>
<td>United Kingdom, Ireland</td>
</tr>
<tr>
<td>* Career development training</td>
<td>Ireland</td>
</tr>
<tr>
<td>* Coping with aggression</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>* Performance appraisal system</td>
<td>Ireland</td>
</tr>
<tr>
<td>Other measures</td>
<td></td>
</tr>
<tr>
<td>* Development of occupational health service</td>
<td>Finland</td>
</tr>
<tr>
<td>* Improved registration of sickness absence and managing the sickness report</td>
<td>The Netherlands</td>
</tr>
</tbody>
</table>
Step 4: Implementation

Most organizations have chosen to integrate the interventions in the regular company and management structure. This implies that (line) management is responsible and that stress prevention (for example, introducing the interventions) belongs to the “normal daily duties” of supervisors. Sometimes (for example, Finland) measures were pre-tested, before implementing measures on a larger scale.

In various cases principles of worker participation were explicitly chosen, for example in the Finnish case, in the Danish bus company (where in fact worker participation was the heart of the intervention), in the Swedish case, in the German health circle, and in the Irish airport management company. Implementing improvements was not always easy and did not always proceed according to plan. In the final step, we will discuss both obstructing and stimulating factors.

Step 5: Evaluation

Our overview of these nine cases demonstrates that stress monitoring and stress reduction is not merely a technical process (based on a technical analysis and on the simple, straightforward realization of recommendations and receipts), but relates to changing and improving organizations and organizational processes. This may be a time-consuming process (as in the Finnish case), and often this does not seem to be a “one-off event”. Several organizations continued their efforts to reduce occupational stress after the evaluation step. In some cases stress prevention now seems to be “business as usual”, i.e., part of normal company processes and related to the company’s aims (for example, Finland, The Netherlands, Belgium, Ireland). In other projects (United Kingdom, Sweden, Germany, Italy), it is not clear to what extent there existed a follow-up.

Objective effects

With respect to the effects of these intervention programmes we can differentiate between more objective and more subjective effects. As to the more objective data, changes in company-registered sickness absenteeism were measured in four cases (The Netherlands, Belgium, Denmark, Sweden). In The Netherlands the sickness absence percentage was significantly lower post-intervention (1991: 8.9%; 1994: 5.8%; \( p < .05 \)). The absence percentage in the Belgian company decreased from 4.3% to 3.45% \( p < .05 \). Also in Sweden the reduction in absence percentage was significant \( p < .05 \); no exact numbers reported by Theorell & Wahlstedt, 1999). In the Danish bus company, the change in absence percentage (from 15 working days on average to six days, two years later) was in the expected direction, but not significant, probably due to the small number of employees. In the other projects more objective data on absenteeism could not be
provided. Since the absence data in the United Kingdom were “only” self-reported, they have not been taken into account here. In addition to the absence data, other more objective outcome measures have hardly been studied. An exception is in the Italian case, where more student nurses from the experimental group passed the exam.

Subjective effects

Regarding subjective, i.e., self-reported, effects more data are available. Subjective evaluations were recorded in all cases, with the exception of Belgium and Ireland. Mostly, these data relate to (changes in) subjective evaluations of work factors (Finland, The Netherlands, Sweden, Germany), to evaluations of changes that were implemented (Denmark, Germany), and to (changes in) health complaints (Finland, The Netherlands, United Kingdom, Sweden, Italy). Sometimes pre- and post-intervention comparable questionnaires were administered (for example, The Netherlands, Sweden, United Kingdom, and Italy). In general, positive self-reported results stem from these evaluations. In the Finnish study the overall subjective evaluation of work changes was positive, although time pressure had increased. When comparing pre-test and post-test in the Dutch study, an improvement in working conditions, intensified attention for sick employees and working conditions, and a better psychosocial work climate were reported. Post-intervention (after three months), in the United Kingdom project individual health variables were improved in the exercise group. Relative high levels of satisfaction (with respect to the project, the enriched job, the running of the service, and the election of the service drivers) were found among the Danish bus drivers. Skill discretion and authority over decisions had improved significantly in the Swedish case. According to the employees in the German project, improvements had a high impact on stress reduction, and communication and social support were improved. In the Italian study various positive effects were reported both in the experimental and in the traditional group.

Costs and benefits

None of the projects involved in the current study was equipped with a specialized economist. Furthermore in only one project were the financial costs and benefits assessed in detail (The Netherlands). In this Dutch hospital the benefits clearly exceed the costs (see Appendix; for more detailed calculations, see Lourijsen et al., 1999, pp. 113–115).

Some organizations found it too difficult to estimate these figures. In the Finnish corporation—in a project that lasted over 10 years—the constitution of the labour force changed over time (for example, due to mergers), and various sub-companies had different systems for the registration of sickness absenteeism. Still there are indications from several cases that these projects may be regarded as successful from a financial perspective. In the pharmaceutical
company in Belgium there is no doubt that the benefits related to the decrease in absenteeism did exceed the costs of the intervention programme. In the Danish bus company the budget had been kept by the drivers, but they were able to hire two new drivers from this same budget. Furthermore, it seems at least probable that the decrease in sickness absence in the Swedish case brought about financial gains. In the other cases there is hardly any or no data in this respect.

Obstructing and stimulating factors

Of course, “en route” there have been various obstructing factors, as listed by the investigators of each case (see Table 3). The first factor seen in Table 3, “time constraints”, is paradoxical as it is directly coupled to the stress issue itself. Especially in those companies where psychosocial demands (for example, workplace, deadlines) are very high, and therefore stress may constitute a major problem, there is not much time for “extra” effort in a new stress-prevention approach. For example, key persons who might be the right persons to participate in a steering committee, are often overloaded with other tasks and state that they simply lack the time to chair and prepare meetings. Another example is in the case of high work-related sickness absenteeism, where it becomes difficult to organize training sessions during work time, since so many employees are sick and “production must go on”.

The second factor, “everything takes a lot of time”, follows on from the fact that serious stress prevention relates to changing and improving organizations, which indeed often is a time-consuming process (see “duration”, in the Appendix). Furthermore, especially “when things take time”, it may be difficult to keep middle level supervisors and employees involved (factor 4). The third factor (“differences in expertise”) points at sometimes conflicting demands, especially in large organizations, between on the one hand creating commitment from—and linking pins with—various organizational parties, and on the other hand creating a well-informed small and decisive professional task force. The fifth factor points at a general problem with respect to the assessment and evaluation of risks in the psychosocial work environment. There are yet no evidence-based clear cut-off points or general rules in order to decide whether a

<table>
<thead>
<tr>
<th>Obstructing factor</th>
<th>Project</th>
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<tbody>
<tr>
<td>Time constraints</td>
<td>Belgium, United Kingdom</td>
</tr>
<tr>
<td>Everything takes a lot of time</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Differences in expertise in steering committee</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Difficulty in keeping middle-level and employees involved</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>What is a constraint and what is not? (20% complaints?, 30%)</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Differences between practical and scientific aims</td>
<td>Finland</td>
</tr>
</tbody>
</table>
certain level (e.g., percentage) of complaints constitutes a major risk factor or not. For example, if 60% of employees report that their supervisor “does not give them enough feedback and information”, many researchers would conclude that the communication between this supervisor and his/her employees should be improved. But would we draw the same conclusion in case the percentage was 20%, or 15%? Relative comparisons with reference groups may help, but bear the risk that risk factors will be underestimated, in case not only the “experimental” group has a high score but also the “comparison group”. Let us, for example, suppose that 60% of the employees in company A reports “to be working under high time pressure”, and that a common score in this branch of industry is 65%. Let us also suppose that this difference is statistically significant. Although employees in company A report less time pressure than in the comparison group, we would still argue that time pressure is a problem that should be dealt with in company A.

Differences between practical and scientific aims (factor 6) constitute another potential obstructing factor. Whereas scientific aims emphasize extensive and detailed analyses of stressors and strains (e.g., triangulation), employees and management often want changes. Therefore, the question “When do we know enough?” will be answered differently by scientists and by organizational decision-makers. In practice, further data gathering and data-analysis may even inhibit organizational improvement, “letting the momentum fade away”. A further example of competing demands between academic research and organizational practice is that longitudinal data collection, to be preferred from a research angle, may inhibit further participation and leave intervention projects with a biased sample (Kalimo & Toppinen, 1999). All in all, based on this overview we would conclude that obstructing factors are natural. On the other hand, it follows from these cases that they can be overcome. Apart from these obstructing factors, several factors were mentioned as being stimulating (see Table 4). Stimulating factors fall in two broad categories: (1) project organization and process variables, and (2) analysis and instruments (see also next section).

DISCUSSION

In a multiple case study approach European cases in work stress prevention were collected, analysed and compared. We will now discuss two questions: (1) whether these cases were successful, and (2) “which interventions work”.

Were these cases successful?

Generally speaking in most cases the answer could be “yes”. Four cases did offer more objective data on sickness absenteeism. In three of these four cases (the projects from The Netherlands, Belgium, Sweden) a significant reduction of
sickness absence was demonstrated. In the fourth case (the Danish bus company) the reduction did not reach significance, probably due to small sample size.

Self-reported effects were available in all cases, with the exception of Belgium and Ireland. In general there were positive outcomes (e.g., less constraints in the work situation, decreased health complaints, positive evaluations of implemented measures). Furthermore there were clear indications from several cases (The Netherlands, Belgium, Denmark, Sweden) that they may be regarded as successful from a financial perspective.

The next question that should be answered is the question into internal validity: Might these predominantly positive effects be attributed to the interventions? According to Cook and Campbell (1979) an untreated control group design with pre-test and post-test (****, *****; Murphy, 1996) is the desirable option to answer this question. We may bear in mind that, although true experiments offer the best potential for causal inferences, they do not guarantee that causal references can reasonably be made, or that associations between variables reflect causal relations between the higher order constructs that they are supposed to operationalize. “Plausible rival hypothesis” means that for each study (and research design) we should critically assess possible threats to internal validity, i.e., potential third variables that can invalidate these relations. Overall, in two cases (United Kingdom, The Netherlands) a genuine control condition existed (rating ***** and ****). The other seven projects did receive a *** rating. The high rating from the United Kingdom case may be related to the

TABLE 4
Main stimulating factors in the nine cases

<table>
<thead>
<tr>
<th>Factor</th>
<th>Project</th>
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<tbody>
<tr>
<td>1. Project organization and process variables:</td>
<td></td>
</tr>
<tr>
<td>*Stepwise and systematic approach</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>*Clear structure (tasks, responsibilities)</td>
<td>Belgium</td>
</tr>
<tr>
<td>*Participative approach</td>
<td>Denmark, Germany, Ireland</td>
</tr>
<tr>
<td>*Co-operation between management and representatives of employees</td>
<td>Sweden</td>
</tr>
<tr>
<td>*Recognition of employees as “experts”</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>*Emphasizing the responsibility of management/critical openness of senior management</td>
<td>Belgium</td>
</tr>
<tr>
<td>*Combining monitoring and intervention</td>
<td>Italy</td>
</tr>
<tr>
<td>2. Analysis and instruments:</td>
<td></td>
</tr>
<tr>
<td>*Proper risk assessment/adequate instruments</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>*Assessment of risks for whole company and certain departments/positions</td>
<td>Finland, The Netherlands</td>
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<tr>
<td>*Using direct assessments of employees and management</td>
<td>Germany</td>
</tr>
<tr>
<td>*Using clear facts and figures to convince top management</td>
<td>Finland</td>
</tr>
<tr>
<td>*Combining monitoring and intervention</td>
<td>Belgium</td>
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</table>
content of the intervention which, in a United Kingdom tradition of emphasizing interventions at the individual level, was primarily a training programme directed at the employee. For such a programme, it is easier (although not easy!) to develop a randomized control condition than for a programme that puts the emphasis on changing stressful working conditions (e.g., Finland and Sweden).

Although from a methodological point of view these *** designs may seem somewhat “meagre”, we considered them acceptable for the type of study we performed. First, the hectic organizational arena, rapid changes in companies, and the fact that managers and not scientists rule companies, do make it practically impossible to “play fully by the methodological rules”. Second, whereas randomization had proved a proper solution to the problems of confounding and selection in biomedicine and psychology, the method does have a number of limitations for psychosocial work environment research (see Kompier & Kristensen, in press). In biomedicine and psychology the usual unit of randomization is the individual, whereas in work environment intervention studies the unit of intervention is often a work site or department. In such situations the number of potential intervention and control departments is usually very limited and randomization makes little sense. Third, we think there is some “methodological compensation” in many of these cases. Many of them receive good marks on other methodological criteria: reliable and valid assessment of stressors and outcomes, appropriate statistical analyses of the data, and “good” sample or population size, ranging from 29 (Denmark) to 19,000 employees (Finland). Although in various cases there are possible threats to internal validity (e.g., history, regression to the mean, selection) and to external validity (e.g., interaction of selection and intervention), our general conclusion is that—given the systematic assessment of risks and risk groups, and the “tailor-made” interventions—it is at least plausible that the positive outcomes can largely be attributed to the intervention programmes. External and construct (theoretical) validity are a matter of replication and variations of these “experiments”, and especially a matter of more theoretically developed and well-designed intervention studies (i.e., studies with a research design rating of **** or more). In addition, it would make sense to learn from less successful cases in prevention. However, it is not common practice among companies to have unsuccessful outcomes published, since this may be regarded bad publicity. Also many researchers prefer to publish positive results, whereas most editors of scientific journals prefer significant outcomes over no results.

Which interventions work?

A crucial question is: “Which interventions work?” That is, what specific measure had what specific effect? It is difficult to answer this question. Not only the starting situation but also the remedies and the outcome variables differed over cases. Most (seven) companies preferred a cocktail of medicines, often
combining work-directed and worker-directed measures. It is the paradox of “field” intervention research that those intervention programmes that offer the best preventive potential (e.g., addressing the real problems, multi-modal treatments directed at work and the worker), make it difficult to answer the question “What works?” In addition, as we argued earlier, the success of stress prevention depends not only on the content of the intervention (“what”, i.e., the specific measure taken), but also on the process (“how”, e.g., introduction and implementation). The reason is, as we emphasized previously, that employees, supervisors, and managers are not passive objects of study but active subjects, shaping their own working situation. This implies that a potential adequate intervention aimed at the reduction of a real constraint in the work situation (e.g., a forward rotating shift schedule to replace a less healthier backward rotating schedule), may even have a negative impact on the health and motivation of employees when forced upon them by an authoritarian supervisor.

Success factors in prevention?

Stress prevention thus relates to both content and process variables, which often are intertwined. With Griffiths (2000) we hypothesize that such processes (in terms of conceptualization, design, and implementation of interventions) are likely to be more generalizable than outcomes. Against the background of the present study (Table 4), and other studies in this domain (Kompier, Aust, Van den Berg, & Siegrist, 2000; Kompier et al., 1998), it is our hypothesis that a stress prevention quality approach that combines “content” and “process” might be based on five key factors. These “Big Five” of stress prevention are: (1) A stepwise and systematic approach. In addition to the proper sequence in problem solving, this involves a clear determination of aims, tasks, responsibilities, planning, and financial means. (2) An adequate diagnosis or risk analysis, identifying risk factors and risk groups. “An organisation needs to know its starting point in order to assess the benefits derived” (Cooper, Liukkonen, & Cartwright, 1996). Although this statement may seem trivial, the practice of stress prevention is different, as was argued earlier. (3) A package of interventive measures that theoretically and logically “fit in” with the problems identified in the risk analysis; mostly a combination of work-directed and person-directed measures. (4) A participatory approach assuring involvement and commitment of both employees and middle management. Employees should be recognized as experts with respect to their own work situation. In addition, participation in itself may have a positive motivational effect. (5) The sustained commitment of top management. The success of the stepwise approach we suggest depends largely on the sustained commitment of top management (see also Kopelman, 1985). It is important that top management incorporates preventive activities in regular company management. Paying attention to the psychosocial working environment should become “business as usual”, that is a regular task of supervisors.
Only with such an approach can work stress management be regarded as a “normal” company phenomenon, i.e., a phenomenon that can be understood and therefore dealt with.

By analysing and comparing various European stress prevention projects, we have tried to contribute to both stress research and practice by reducing the gap between both fields. This study suggests that “true prevention” (i.e., preventive measures that are based on an adequate diagnosis identifying risk factors and risk groups, that theoretically and logically fit in with the problems, and that are introduced and implemented in a proper way) may be beneficial to both the employee and the organization.

REFERENCES


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APPENDIX
Characterization of nine European cases

Finland (n = c. 19,000)

Step 1: Preparation

Motives: paying attention to “human capital”, prevention of work related health problems, stress and promotion of workers' health

Organization: complex action-research programme; Programme Advisory Committee, Programme Management Committee; outside consultancy

Research design rating: ***

Duration: > 10 years

Step 2: Problem analysis

Instruments: questionnaires, job analysis, psycho-physiological stress study

Risk factors: e.g., little possibilities for advancement and for participation, lack of feedback, time pressure

Risk groups: some factors: the total personnel; other factors: specific groups, e.g., office personnel (most women), and foremen

Step 3: Choice of measures

Two basic approaches chosen: reorganization of work and training of management; implementation of specific development projects

Work directed: reorganization of work (e.g. reorganization of monotonous tasks, integration of maintenance and support functions with production) and training of management (e.g., leadership style); development of work and training of foremen; development of cooperation of office personnel and management; development of psychosocial services in occupational health, and of personnel development

Person directed: training (workshops, seminars)

Step 4: Implementation

Well-planned seminars (after piloting)

Principles of participatory action research

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1Parts of this Appendix have been reproduced with kind permission from Table 15.2 in M.A.J. Kompier and C.L. Cooper (Eds.), Preventing stress, improving productivity: European case studies in the workplace (1999). London: Routledge.
Action plans carried out on nine important topics, e.g., reorganization of monotonous work; personnel development; encouragement of shopfloor participation; increasing psychological resources and preventing stress

Responsibility: management

**Step 5: Evaluation**

Comprehensive survey studies. (Scientific) analyses are still being carried out. Mainly process evaluation, more than outcome evaluation

Absence %: not clear

Subjective evaluation of work changes: overall positive, but time pressure had increased for both office personnel and foremen, and also (10-year follow-up study) for total company

Health complaints: no differences

Costs and benefits: hard to assess in such an extensive project, e.g., due to changes over time in workforce, unit-differences in recording absenteeism. The fact that the process still goes on after 10 years is seen as an indicator of its value

Obstructing factors: sometimes differences in interests between company and consultants/researchers (more practical versus more scientific aims)

Stimulating factors: using direct assessments of employees and management

Follow-up: yes, actions taken with respect to management procedures, personnel development, performance of the personnel, and work and workplace changes

The Netherlands (n = 850)

**Step 1: Preparation**

Motives: high sickness absenteeism, difficult to hire new personnel

Organization: initiative by management, steering committee, external consultant, participative approach, comparison with “control hospital”

Research design rating: ****

Duration: 4 years

**Step 2: Problem analysis**

Instruments: interviews, checklists, questionnaire, analysis of sickness absenteeism and turnover

Risk factors: high psychosocial workload, interior climate, leadership style, physical workload, shift system, insufficient training and career opportunities
Risk groups: some factors: total organization; others: certain departments

Control condition: other hospital

Step 3: Choice of measures

Work directed: changes in interior climate, work and resting times schedule, technical devices, reduction in physical workload, work organization, job enrichment

Person directed: managerial information with regard to sickness absenteeism figures and procedures with regard to sickness absenteeism, training for supervisors, better guidance in case of sickness, health promotional initiatives, various trainings (a.o., coping with aggression, individual stress management, alcohol, smoking)

Step 4: Implementation

Organization: various subprojects with a participative approach

Responsibility: final responsibility by top management; coordination by steering committee; practical implementation of subprojects by (line) management in departments

Step 5: Evaluation

Comparing pre-test and post-test: improvement in working conditions, intensified attention for sick employees and for working conditions, better psychosocial work climate

Comparison with "control hospital": control hospital scores better at some variables in questionnaire (post-test)

Absence %: 8.9% (1991) → 5.8% (1994) (significant, \( p < .05 \)) now below average hospital level and below control hospital

Costs and benefits: Total costs due to technical measures, courses/training programmes, organizational measures add up to NLG 1,171,725 (A). Benefits only include cost savings due to reduction of absenteeism in 1992, 1993 and 1994, and account for NLG 2,618,000 (B). Two approaches were chosen to estimate the costs–benefits ratio: (1) B–A=c. NLG 1.4 million; (2) the second approach takes account of the decreasing sickness absenteeism in the sector (Dutch hospitals). After this adjustment the benefits total NLG 1,632,000 (C), and the difference between costs and adjusted benefits is C–A=c. NLG 460,000. In both cases there is a positive result

Obstructing factors: difficult to keep middle management committed, differences in steering committee, unclear what are the responsibilities of the steering committee, "everything takes a lot of time", difficult to keep employees involved in a four-year project, difficult to assess objectively "which is a serious constraint and which is not"

Stimulating factors: stepwise approach, adequate instruments, course in guidance in case of absenteeism, employees very committed in subprojects, information and discussion day for all employees

Follow-up: yes, increasing responsibility for supervisors
Belgium (n = 3261)

Step 1: Preparation

Motives: unions and works council considered stress as a topic; employees asked for measures to be taken against stress; signals to medical officers; need to know whether there was a stress problem

Organization: taskforce with important role for health department and training manager; questionnaire study evaluated by university

Research design rating: ***

Duration: 2 years

Step 2: Problem analysis

Instruments: questionnaire study (personal data, experience of stress, psychosomatic complaints, work factors) on representative sample of 324 employees

Risk factors: e.g., poor job content, social relationships at work, terms of employment

Risk groups:
(a) men, senior (> 15 years), no management responsibilities;
(b) women, medium seniority (5–15 years), no management responsibilities

Step 3: Choice of measures

Work directed: ergonomic interventions

Person directed: information session for senior management; training course "coping with stress"; obligatory training for managers in "people management" and recognition of stress signals; managers trained in ergonomics

Step 4: Implementation

Action plan approved by senior management, unions, works council

Many information and discussion sessions in company

Circa 1000 workplace analyses (ergonomics) by two company nurses

Special task force on "work family interface" planned but never started

Step 5: Evaluation

Absence %: significant reduction of sickness absenteeism (from 4.3% to 3.45%; p < .05)

Other effects: stress is no longer a taboo and is now on the company agenda. A lot of positive attention in media
Costs and benefits: no detailed calculations but benefits from decrease in absenteeism clearly exceeded the extra costs

Obstructing factors: time constraints

Stimulating factors: critical openness of senior management; using clear facts and figures to convince top management; drive of taskforce to assess and reduce stress

Follow-up: yes, in company

United Kingdom (n = 270)

Step 1: Preparation

Motives: senior management wanted to decrease reported strain among employees and to improve their coping skills

Organization: initiative: senior management; important, independent, role for external researcher (university) being the “motor” of the study; attempt to combine “good research methodology” with company wishes

Research design rating: *****

Duration: c. 1 year

Step 2: Problem analysis

Instruments: pre-test and post-test with reliable questionnaires. Individual variables: e.g., anxiety, depression; mental and physical health. Organizational variables; organizational commitment, job satisfaction. Also biographical data. Self-reported sickness absenteeism (frequency, days)

Risk factors: (from previous stress audit) volume of work, reduction in staff numbers, coping with change

Risk groups: all employees

Step 3: Choice of measures

Work directed: no specific initiatives

Person directed: three training programmes:
(a) Personal stress awareness
(b) Exercise
(c) Cognitive restructuring

Participants (managerial and non-managerial employees) were volunteers, and were randomly allocated into one of these three training programmes. There was also a wait-list control group and a full control group (non-volunteers) (groups 4 and 5)

Training programmes consisted of one one-hour general session and one two-hour workshop
Step 4: Implementation

Responsibility: senior management, but central role for researcher

Duration: after base line recording, first measurement after 3 months and second measurement after 6 months

Step 5: Evaluation

Questionnaires: no pre-test differences between conditions. Post-intervention: after 3 months exercise group improved on all “individual health variables”. Some improvements in “awareness group”, no changes in “cognitive group”. After 6 months some positive effects left in exercise group, but not in awareness group or cognitive group. No changes after 3 or 6 months in organizational commitment or job satisfaction

Absence %: self-reported absence frequency decreased in exercise group, but increased in other two groups. Doubts about quality of sickness data (self-report, retrospective)

Costs and benefits: no detailed analysis. Costs are reported to be small

Obstructing factors: lack of time (time pressures and heavy work loads); lack of contact with participants during the study

Stimulating factors: some concern among employees about their own levels of stress

Follow-up: no follow-up data

Denmark (n = 29)

Step 1: Preparation

Motives: jointly improving working conditions and increasing productivity

Organization: development workshops, seminars for drivers, management, and labour organizations

Research design rating: ***

Duration: c. 5 years

Step 2: Problem analysis

Instruments: previous studies on bus drivers, discussions among bus drivers

Risk factors: e.g., management style, running of the service, ergonomics

Risk groups: all bus drivers

Step 3: Choice of measures

Work directed: introduction of self-regulating (autonomous) team; drivers were free to organize as they wished within the limits of the budget

Person directed: three-week full-time introductory course
**Step 4: Implementation**

Eight working groups were established (e.g., rota planning, advertising and design of the buses, personnel management, and uniforms); quarterly general meetings, where decisions were made; service drivers elected

**Step 5: Evaluation**

*Absence %:* decrease from 15 working days on average to 6 days (after 2 years)

Passengers complaints decreased

Relative high levels of satisfaction among drivers (with respect to project, job, running of the service, elected service drivers)

*Costs and benefits:* budget had been kept, and two extra drivers could even be employed

*Obstructing factors:* tendering-system

*Stimulating factors:* participative approach

*Follow-up:* yes, in some other companies, but “less far reaching”

**Sweden (n = 136)**

**Step 1: Preparation**

*Motives:* high sickness absenteeism, decreased productivity, demands for effectiveness and speed

*Organization:* management initiated changes; active occupational health care team; academic support for evaluation

*Research design rating:* ***

**Step 2: Problem analysis**

*Instruments:* valid questionnaires

*Risk factors:* monotony

*Risk groups:* mail sorters

**Step 3: Choice of measures**

*Work directed:* Smaller more autonomous production units; small increase in staff (+2.5%); introduction of small working groups; improved information systems; change in shift systems; new food vending machine/microwave ovens

*Person directed:* not specified
**Step 4: Implementation**

Employees participated in planning of organizational changes

Important role for occupational health care team

**Step 5: Evaluation**

Two follow-up measurements, valid questionnaires on work and health (e.g., job demands, control, social support); sickness absence data; first follow-up represents final stage of intervention; second follow-up one year after start

*Questionnaires*: after one year skill discretion and authority over decisions had improved significantly

*Absence %*: significant reduction of sickness absenteeism (full-time and part-time employees) ($p < .05$)

*Costs and benefits*: no detailed analysis made, but it is clear that decrease in sick leave means financial gains

*Obstructing factors*: not specified

*Stimulating factors*: cooperation between management and representatives of employees

*Follow-up*: not known

**Germany (n = 230)**

**Step 1: Preparation**

*Motives*: workplace health promotion

*Organization*: central role for health work group. External consultancy. Installation of health circle

*Research design rating*: ***

*Duration*: c. 2 years

**Step 2: Problem analysis**

*Instruments*: questionnaire on work and health; workplace observations; discussions and interviews

*Risk factors*: high musculoskeletal work load (e.g., lifting and carrying) and high psychosocial work load (stress, e.g., through patients, supervisors)

*Risk groups*: all nurses, and on certain factors also other employees
**Step 3: Choice of measures**

*Work directed*: amongst others, changes in information flow and communication, better coordination, ergonomic and technical improvements

*Person directed*: amongst others, training of personnel

**Step 4: Implementation**

The health circle identified stressful work situations and suggestions for improvement. The hospital management approved of these measures and the planning with respect to implementation of these measures

**Step 5: Evaluation**

*Subjective effects*: after 6 months the project was evaluated by means of a questionnaire study. Improvements were said to have a high impact on stress reduction; communication and social support had improved

*Absence %*: no data available

*Costs and benefits*: unknown

*Obstructing factors*: the “original” questionnaire needed to be adapted since it did not include questions about work

*Stimulating factors*: participative approach

*Follow-up*: not known

**Ireland (n = 953)**

**Step 1: Preparation**

*Motives*: to investigate stress and identify stressors, ambition to formulate a prevention plan; wish to disseminate relevant information on stress management among staff

*Organization*: “stress working group” installed. External consultancy. Support by management, representatives of employees, and unions

*Research design rating*: ***

*Duration*: since 1988

**Step 2: Problem analysis**

*Instruments*: extensive survey, after piloting, among all employees; demography, sources of stress at work and outside of work, social support, outcomes of stress, health/coping behaviour

*Risk factors*: amongst others, working time pressures, responsibilities, overwork; pay; promotion, permanency, job security; supervision difficulties; lack of resources; poor management support; lack of information; work environment
Risk groups: some factors: total organization; specific groups at risk were amongst others: 30–39 years of age; certain departments (airport police/fire services, trading department); shiftworkers; lower grades (these factors are not independent of each other)

**Step 3: Choice of measures**

Before starting, two approaches were chosen: (1) organizational development, and (2) health promotion approach (examining and improving the health and welfare services of the company to address stress). From a long list with respect to both areas several measures were selected

Work directed: improving shift work regulations (amongst others, redesign of shift rosters); improve communications (amongst others, increase access to information, update management development programme); performance appraisal for all staff

Person directed: career development (training for staff, encourage internal work experience); health awareness and health promotion programme (amongst others, development of awareness of stress through training courses; increase awareness of negative effects of smoking; health screening; healthy eating policy)

**Step 4: Implementation**

After the analysis and after the list of recommendations was made, the involvement of the external consultants ended. The approach taken was a participative one (employee involvement). Two new “high level action teams” were set up: one for the organizational development programme (track 1) and one for the health promotion programme (track 2). It was recognized that not all recommendations could be acted on at once. Both teams developed an action plan (with criteria such as feasibility, importance and resources). In all, 20 distinct actions were undertaken

**Step 5: Evaluation**

Of those 20 actions, six years after the analysis, 14 are still ongoing or in progress

The programme was undertaken as a pragmatic exercise. The tasks of the external consultant ended after the analysis. Formal evaluation was not a high priority. Still there are some clear positive outcomes, such as better shift regulations, a support manual for shiftworkers, training for new shiftworkers and supervisors, and improvements in communication practices

Absence %: not known

Costs and benefits: not known

Obstructing factors: not specified

Stimulating factors: the two intervention teams (and not the external consultants) took effective ownership of the implementation

Other effects: the project has created an awareness of occupational stress and a set of skills within the company which did not exist before

Follow-up: yes, ongoing project (14 out of 20 “original” actions are still ongoing or in progress)
Italy (n = 128)

**Step 1: Preparation**

*Motives*: preventing risks of stress and burnout by developing effective coping styles

*Organization*: cooperation of nurse school supervisors, occupational health professionals and university

*Research design rating*: ***

*Duration*: 6–12 months

**Step 2: Problem analysis**

*Instruments*: validated questionnaires on work and (psychological) health

*Risk factors*: based on “nurse burnout” literature

*Risk groups*: all student nurses

**Step 3: Choice of measures**

Difference work directed versus person directed hard to assess: controlled programme of support and supervision

*Work directed*: experimental group; regular group discussions, control group: none

*Person directed*: experimental group: individual supervision, support from older nurse; control group: support from older nurse only

**Step 4: Implementation**

For both the experimental and the traditional group measures were implemented and combined with “ward activity”

**Step 5: Evaluation**

*Absence %*: not measured

*Questionnaires*: in general various positive effects from Time 1 to Time 2 in both the experimental and the traditional group (e.g., decrease of anxiety, better psychological condition, higher self esteem)

*Other benefits*: significantly more students from the experimental group passed the exams

*Costs and benefits*: not known, presumably positive

*Obstructing factors*: not specified

*Stimulating factors*: combining monitoring and intervention; making use of already available resources

*Follow-up*: unknown