

Stress Management Interventions in the Dutch Domiciliary Care Sector: Findings From 81 Organizations

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This study evaluated the effectiveness of a large-scale job stress reduction program implemented in the Dutch domiciliary care sector. The employees of 81 organizations were interviewed twice (only nurses in executive jobs; total sample size exceeded 26,000). Organizations that implemented many interventions were expected to be more successful in reducing job stress than were other organizations. It was found that (a) levels of job stress decreased during the observed interval; (b) organizations with many suboptimal scores on selected work characteristics took, on average, more measures to reduce job stress than others; (c) organizations usually implemented a wide variety of measures; and (d) work-directed (but not other) interventions were linked to job stress reduction. The effects of these interventions, however, were weak.

KEY WORDS: job stress interventions; nurses; burnout; job characteristics

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Over the past 5 years, the Dutch government, trade unions, and employers' organizations have instigated a nationally comprehensive program intended to reduce job stress in various occupational sectors. At the time, there were strong indications that (compared with other countries) job stress was a major problem in the Netherlands (Merllie & Paoli, 2001), resulting in high work-incapacity rates (Geurts, Kompier, & Gründemann, 2000; Schaufeli & Kompier, 2001) and associated costs (Gründemann & Van Vuuren, 1997). During this period in many sectors of the labor market, Covenants on Health and Safety at Work (CHSWs) were concluded among representatives of the Dutch government, trade unions, and employers' organizations in an attempt to reduce job stress. Within the framework of these CHSWs, within-sector agreements were made concerning the reduction of job stress and burnout, over and above existing policy measures such as working conditions regulations, financial incentives for individual organizations, and public information campaigns.

In general, these agreements often took the form of large-scale programs starting with an assessment of the quality of working life (e.g., levels of burnout, workload, job control) in all organizations in each respective sector. This information was then fed back to these organizations, allowing them to compare their own results with those obtained by their fellow organizations (i.e., *diagnosis* through a benchmarking approach). On the basis of this information, the organizations could decide which actions they should take (if any) to target possible work-related bottlenecks in their organization (*intervention*). Finally, in order to assess the effects of this approach, a sectorwide follow-up study was envisaged that again assessed the quality of working life (*evaluation*). It was expected that this approach would allow organizations in specific sectors of the labor market to effectively address possible work-related health risks such as high job pressure in their specific organization, thus reducing the number of workers confronted with such risks by 10% within the next 5 years (Ministry of Social Affairs and Employment, 2000). This, in turn, was expected to result in lower levels of absence due to sickness, work-incapacity rates, and related costs.

The domiciliary care sector was the first to complete the diagnosis–intervention–evaluation cycle proposed in its respective CHSW. Organizations in this sector (i.e., the agencies) offer long- and short-term services to people who need help or attendance with regard to housekeeping, care, or nursing (e.g., elderly people, chronically ill or mentally or physically impaired people, but also those who have just returned from hospitalization and still need help). Domiciliary care workers (who are almost exclusively women and whose level of education varies from primary education only to a college degree) provide their clients with instrumental, emotional, and informational support to improve their clients' daily functioning (e.g., they

help their clients get out of bed and to the toilet; they help them wash themselves; they listen to their clients' expressions of grief, take care of household chores, and may also assist them in developing skills to live more independently). Their services thus help people to keep living in their homes as long as possible. As in other "helping professions" (Maslach, 1993), levels of burnout are traditionally high in this sector. For example, an earlier study (Taris, Stoffelsen, Bakker, Schaufeli, & Van Dierendonck, 2002) compared the scores of 9,503 employees in 28 human services professions and found that domiciliary care workers run an above-average risk of burnout, which underlines the importance of job stress reduction in this segment of the labor market.

The current study presents the first systematic evaluation of the results of this unconventional and ambitious attempt to target job stress in the domiciliary care sector. It draws on a unique database comprising data for two occasions from 81 agencies, involving the responses of over 45,000 workers. The central question addressed in this study concerns the effectiveness of this large-scale effort to reduce job stress in the domiciliary care sector. On the one hand, this required that we obtain insight into what organizations actually do in their attempts to reduce job stress and to what degree their efforts depend on the feedback they receive regarding the working conditions in their organization. On the other hand, this question calls for an evaluation of the effects of the measures that were taken to reduce job stress: Has job stress decreased because of these interventions, and do these effects vary for different types of interventions?

We first briefly review current insights concerning the effectiveness of job stress interventions. On the basis of this review, we formulate several exploratory research questions and hypotheses. We then present the results of our analyses.

JOB STRESS INTERVENTIONS

A rapidly expanding body of research in the job stress literature deals with the effectiveness of job stress interventions. These interventions may be classified in terms of their target. For example, DeFrank and Cooper (1987); Giga, Faragher, and Cooper (2003); and Schaufeli and Enzmann (1998) distinguished among work/organization-directed interventions, person/work interface-directed interventions, and person-directed interventions. *Work-directed interventions* focus on factual changes in the work content and/or relations at work and are geared toward eliminating, reducing, or altering stressors in the work situation (e.g., job redesign and restructuring, ergonomic improvements). These interventions apply to all members of the organization or in a particular job.

Interventions focusing on the person/work interface are usually intended to increase employee resistance to specific job stressors. Such interventions are often targeted toward changing personal characteristics (e.g., broadening one's coping repertoire by giving feedback, training programs), with the explicit aim to improve particular aspects of the employee's functioning at work. Thus, these interventions focus on the working individual in the context of the organization, aiming to improve the match between the person and his or her work environment (Dawis & Lofquist, 1984). Note that this type of intervention may apply to all employees performing a particular task or only to employees who perform poorly or who show signs of stress.

Finally, *person-directed interventions* are targeted toward changing personal characteristics without the explicit aim to improve employee functioning at work (e.g., exercise, employee assistance programs, relaxation training). This is not to say that performance at work may not improve as a result of these measures but rather that no explicit link with particular stressors in the work situation is made (cf. Schaufeli & Enzmann, 1998). The assumption behind these general interventions is that their effects will spill over to the work situation (e.g., stress management programs may focus on increasing employee coping skills in general and not in the work situation). Similarly, the possible benefits of employee health programs may improve employee functioning both within and outside the work context.

How effective are job stress interventions? One important question concerns the effectiveness of various types of job stress interventions. Newman and Beehr (1979) presented the first comprehensive and critical review of various strategies for handling job stress. Although their study revealed that many strategies for managing job stress existed, their main conclusion was that the effectiveness of these strategies could not be evaluated, because methodologically reliable evaluative research was lacking. Since then, many reports on the effects of stress management interventions have appeared, including several reviews (among others, Giga et al., 2003; Murphy, 1988, 1996; Semmer, 2003; Van der Hek & Plomp, 1997; Van der Klink, Blonk, Schene, & Van Dijk, 2001). The conclusions of this research suggest that there is no easy answer to the question of whether stress interventions really work. As Semmer (2003) formulated, "[work-related] interventions do have potential for positive effects. It is, however, hard to predict specifically which changes are likely to occur" (p. 340). Semmer argued that the question is not so much *whether* organizational stress management programs are effective in reducing job stress but rather *what* can be expected under *which* circumstances. The effectiveness of stress interventions thus depends on a host of factors, including the type of target variables, the match between the intervention and the target variable (ide-

ally, the intervention deals directly with the target variable; Kompier, 2002), the severity of the problem, the modifiability of job stressors, and such process considerations as the degree to which workers were involved in the decision-making process concerning these interventions (Heaney, 2003; Kompier, Cooper, & Geurts, 2000; Semmer, 2003).

This indistinctness of the findings regarding the effectiveness of stress management interventions does not mean that it is impossible to draw some preliminary conclusions. On the basis of their review of 74 intervention studies that met the minimum requirement of presenting an evaluation of the effects of the intervention, Giga et al. (2003) concluded that “there is suggestion that a *combination* of work-related and worker-related stress prevention and management is likely to be the most effective option” (p. 43; italics added). This implies that organizations that do more (i.e., take more—and more diverse—measures) to prevent or reduce job stress will generally be more successful in attaining their goal than organizations that do less.

STUDY HYPOTHESES AND RESEARCH QUESTIONS

The present study was designed as an evaluation of the effects of the large-scale attempt to reduce job stress in the Dutch domiciliary care sector. These effects were evaluated in terms of across-time changes in (a) four psychosocial work characteristics that are presumed to be important determinants of job stress, namely, job demands, social support, decision latitude (or autonomy), and skill discretion, and (b) job stress, as measured by the Emotional Exhaustion scale of Maslach’s (1993) burnout concept. The work characteristics were chosen on the basis of Kompier’s (2002) study, in which seven theories were reviewed for the effects of work characteristics on worker well-being: the job characteristics model (Hackman & Oldham, 1980), the Michigan organization stress model (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964), the demand–control–support model (Karasek & Theorell, 1990), the sociotechnical approach (Cherns, 1976), action theory (Hacker, 1986), effort–reward imbalance theory (Siegrist, 2000), and the vitamin model (Warr, 1996). The work characteristics mentioned above were selected because these concepts played a pivotal role in at least four of these seven theories, suggesting that interventions dealing with these work characteristics will generally be more effective in reducing job stress than will interventions addressing other aspects.

The present study deals with four related research questions. Three of these have a descriptive or exploratory character, whereas the fourth calls for hypothesis testing:

1. The first question concerns the across-time development of the scores on the four work characteristics and emotional exhaustion:

To what degree did the psychosocial work characteristics and levels of emotional exhaustion change across time?

2. The second question deals with the type and frequency of the stress management interventions that were implemented during the study by the participating organizations: What did organizations do to reduce job stress?
3. The third question concerns the degree to which organizations employed the information provided in the diagnosis phase of the study in deciding about the number and type of interventions they should implement: Which organizations implement what kind of interventions?

In principle, the idea behind the CHSWs was that organizations with below-average working conditions would be more likely to implement interventions designed to improve working conditions than would other organizations. However, it would seem possible that the working conditions in the first type of organization are below par exactly because the management of these organizations has been unable or unwilling to implement measures designed to improve these conditions in the past. If so, there would seem little reason to assume that these organizations would be more active in targeting job stress during the study interval than other organizations.

4. The final research question concerns the effectiveness of the stress management interventions that were implemented: To what degree are across-time changes in the four work characteristics and emotional exhaustion due to the stress management interventions?

As the above review revealed some support for the assumption that stress management interventions may reduce job stress, we expected that organizations that implemented many interventions during the interval between the waves of the study would effectuate stronger improvements in work characteristics than would other organizations (Hypothesis 1). Thus, for organizations implementing many interventions, we expected stronger decreases in job demands (Hypothesis 1a) and stronger increases in social support (Hypothesis 1b), decision latitude (Hypothesis 1c), and skill discretion (Hypothesis 1d) than for organizations implementing fewer interventions.

Generally speaking, some types of interventions may affect the target variables more strongly than other interventions. As we concluded earlier, measures will be more effective with a better match between (a) the stressor and the measure and (b) the measure and the designated target variable

(Kompier, 2002). This suggests that work-directed and person/work interface-directed interventions will be more effective in reducing job stress than will person-directed measures, in which the link between the measure and the stressor (i.e., possible problems in the work situation) and between the measure and the target variable (e.g., burnout, job stress) is weak. Thus, our second hypothesis is that the effects of work-directed and person/work interface-directed interventions on changes in the work characteristics will be stronger than those of other interventions.

A similar reasoning applies to the effects of the interventions on emotional exhaustion. Organizations that implement many interventions will bring about stronger improvements in levels of emotional exhaustion among their employees than will other organizations (Hypothesis 3); stronger effects on changes in emotional exhaustion are expected for work- and person/work interface-directed interventions than for person-directed and other interventions (Hypothesis 4).

METHOD

Participants

At the first wave of the present study (1999–2000), all 115 Dutch domiciliary care agencies with more than 100 employees were contacted. The large majority of these agreed to participate ($N = 105$, 91.3% response). All employees of these agencies received a written questionnaire addressing work characteristics such as job control, job demands and the like, outcome variables such as commitment and burnout, and background variables such as age and gender (see Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003, for a detailed overview of the design of the study). Although at the organizational level response rates varied from 17.1% to 71.4%, the overall Time 1 response rate was quite satisfactory (median response rate = 49.9%, $N = 50,872$). Subsequent nonresponse analysis revealed no major differences between the responses of participants in low- and high-response agencies in terms of the study variables, whereas the sample distributions of age, gender, and job type were equal to those in the target population.

Two-and-a-half years later (2002, Time 2), the second wave of the study was conducted. The design of the study was identical to that of the first wave. All 112 Dutch domiciliary care organizations with at least 100 employees were asked for their cooperation, and 99 of these (86.9%) agreed to participate. Nonresponse analysis revealed that participation in the second wave of the study did not depend on the results of the first wave. Thus, both agencies that performed well and agencies that performed

poorly in terms of their employees' evaluations of their work characteristics continued their participation in the study. The employees of the participating organizations received a questionnaire that was virtually identical to the Time 1 questionnaire. Again, the across-organizations response rates varied quite strongly, ranging from 21.2% to 68.3% (median response rate = 44.6%, $N = 48,207$). There were no major differences between the responses of participants in low- and high-response organizations in terms of the study variables, whereas the sample distributions of age, gender, and job type were equal to those in the target population.

Further, at the second wave of the study, all agencies that had participated in both waves of the study ($N = 83$) received a questionnaire listing 80 interventions that they might have implemented since the first wave of the study. This questionnaire was compiled on the basis of a pilot study among 5 organizations (Price Waterhouse Coopers/Instituut Werk & Stress, 2002) and interviews with experts (e.g., consultants who specialized in interventions in the home care sector, trade union specialists). Interventions that were not listed in the questionnaire could be described at the end of the questionnaire. The questionnaire was completed by the agency management or their representatives (e.g., the chief personnel manager). The questionnaire was returned by 81 organizations (97.6% response).

For the present study, all organizations were selected that participated in both waves and returned the intervention questionnaire (i.e., 81 organizations). Time 1–Time 2 observations could be paired at the organizational level (allowing for within-organization, across-time comparisons) but not at the individual level (in order to stimulate participation, the employees of the organizations participated anonymously at both waves of the study). Further, to maximize between-organization comparability, we confined our analyses to employees in executive jobs (i.e., nurses performing the client-oriented tasks that are typical for the domiciliary care sector), thus excluding participants in support and management functions. The total sample size at the individual level was 26,881 at Time 1 and 26,563 at Time 2 after listwise deletion of missing values. At both Time 1 and Time 2, 98 (98%) of the participants were women (at Time 1, $M_{\text{age}} = 42.6$ years, $SD = 10.2$; at Time 2, $M_{\text{age}} = 42.5$, $SD = 10.3$).

Measures

Work Characteristics

Job demands were measured with the four-item scale developed by Karasek (1985), including such items as “My job requires that I work very

fast” (1 = *never*, 4 = *always*; $\alpha = .84$ at Time 1 and $.82$ at Time 2). Social support was measured with a seven-item scale developed by Van Veldhoven, Meijman, Broersen, and Fortuin (1997)—for example, “Can you ask your colleagues for help if necessary?” (1 = *never*, 5 = *always*; $\alpha = .82$ at Time 1 and $.84$ at Time 2). Decision latitude was measured with Karasek’s (1985) three-item Decision Latitude Scale. A sample item of this scale is “I have a lot of say about what happens at my job” (1 = *never*, 4 = *always*; reliability [Cronbach’s α] was $.61$ at Time 1 and $.60$ at Time 2). Finally, skill discretion was measured with the six items of Karasek’s (1985) Skill Discretion Scale. A typical item is “Do you learn new things in your job?” (1 = *never*, 4 = *always*; $\alpha = .65$ at both occasions).

Job Stress

This concept was measured with the five-item Emotional Exhaustion scale of Maslach’s Burnout Inventory—General Survey (Schaufeli, Leiter, Maslach, & Jackson, 1996). A sample item is “I feel used up at the end of the work day” (0 = *never*, 6 = *every day*; $\alpha = .82$ at Time 1 and $.83$ at Time 2).

Statistical Analysis

Research Question 1: To What Degree Did the Psychosocial Work Characteristics and Levels of Emotional Exhaustion Change Across Time?

This question was addressed in a series of 2 (time: Time 1 vs. Time 2) \times 81 (organization: 81 organizations) analyses of variance (ANOVAs)—one for each of the four work characteristics and one for emotional exhaustion, with organization as a random factor.

Research Question 2: What Did Organizations Do to Reduce Job Stress?

Not all 80 interventions listed in the intervention questionnaire applied to the participants in the executive jobs included in the present study (e.g., implementation of management development programs). Further, some

Table 1. The Seven Most Frequently Occurring Interventions for Each Intervention Type

Intervention	Organizations implementing this intervention	
	<i>n</i>	%
Work-directed interventions (<i>n</i> = 17)		
1. New protocols (e.g., rules for handling sexual harassment, aggression, and violence; rules concerning lifting weights)	29	35.8
2. Additional personnel to decrease workload of present personnel	25	30.9
3. Implementation of structured meetings concerning the planning of tasks and shifts (at least once a month)	22	27.2
4. Employee participation in the planning of tasks and shifts	18	21.4
5. Employee participation in the organization of the team or department	16	22.2
6. Task restructuring to allow for informal possibilities for contact with colleagues (either individually or groupwise)	16	22.2
7. Implementation of semiautonomous teams	15	18.5
Person/work interface-directed interventions (<i>n</i> = 23)		
1. Increased budgets for education and training	43	53.1
2. Training concerning task-related issues (e.g., weight-lifting techniques)	40	49.4
3. Training concerning social skills (e.g., assertiveness training, dealing with emotional situations)	38	46.9
4. Employees receive tools to reduce physical demands	35	43.2
5. Employees can ask for external ergonomic advice	32	39.5
6. Improvement of supervisor–employee contacts during employee sickness/absence by determining a minimum number of contacts and providing a gift	32	39.5
7. On-the-job training	29	35.8
Person-directed interventions (<i>n</i> = 15)		
1. Tailor-made employee benefits (e.g., regarding day care and participation in savings programs)	39	48.2
2. Employees receive a mobile phone to increase (feelings of) safety	36	44.4
3. Improved possibilities for making a career (job mobility program)	24	29.6
4. Free work clothes	19	23.5
5. Discounts on insurance	16	19.8
6. Opportunity to visit congresses and symposia	11	13.6
7. Free access to services of their own home care agency	10	12.3
Other interventions (<i>n</i> = 14)		
1. Organization agrees to conform with general guidelines and norms concerning physical workload in the domiciliary care sector	48	59.3
2. Employees receive a leaflet concerning their social safety at work	34	42.0
3. Employees regularly receive a written newsletter concerning their work conditions	29	35.8
4. Information about the company policy in the form of meetings	23	28.4

Table 1. (Continued)

Intervention	Organizations implementing this intervention	
	<i>n</i>	%
Other interventions (<i>n</i> = 14)		
5. Information about the company policy in the form of articles in the organization's regular newsletter	21	25.9
6. Special offer for handling complaints regarding sexual harassment, intimidation, aggression, and violence	18	22.2
7. Information about the company policy by means of newsletters	15	18.5

interventions listed in the questionnaire did not include any actions directed at changing either work or employee characteristics and could thus not be presumed to affect job stressors or levels of work-related stress (e.g., analyzing the causes of sickness absence without any follow-up actions based on this information). These interventions were not analyzed further. Following DeFrank and Cooper (1987) and Schaufeli and Enzmann (1998), three of us (Toon W. Taris, Michiel A. J. Kompier, & Sabine A. E. Geurts) assigned the remaining interventions (*n* = 69) to one of four intervention categories: person directed (*n* = 15), person/work interface directed (*n* = 23), work directed (*n* = 17), and other (*n* = 14). Examples of the interventions in each category are presented in Table 1. For each measure in this table, we computed the number and percentage of organizations implementing that particular measure, thus revealing the prevalence of these measures. Further, we examined to which degree organizations combined different types of interventions in addressing job stress.

Research Question 3: Which Organizations Implement What Kind of Interventions?

As we wanted to relate the type of interventions that were implemented by organizations to the quality of the working conditions in these organizations, we created an index of the work-related health risks in each organization. Each of the four work characteristics (job demands, social support, decision latitude, and skill discretion) was aggregated to yield a mean score representing the organizational-level score on this particular characteristic. The health risk of working in a particular organization was then computed as the number of times an organization obtained a suboptimal score on each of the four work characteristics (i.e., a score in the top 50% on job demands or a score in the bottom 50% on social support, skill discretion, and decision latitude). The resulting five-category variable

ranged from 0 to 4, with a score of 0 indicating that an organization obtained no suboptimal scores on the four work characteristics in this study (i.e., low health risk) and a score of 4 indicating that an organization obtained suboptimal scores on all work characteristics (i.e., high health risk). To examine the association between the health risks that are present in an organization and the type of interventions implemented, we conducted a 4 (intervention type: work directed, person/work directed, person directed, and other) \times 5 (health risk: 5 categories) multivariate analysis of variance (MANOVA), with intervention type as a within-organization factor and polynomial contrasts on health risk. Aggregated data from the 81 participating organizations were used.

Research Question 4: To What Degree Are Across-Time Changes in the Four Work Characteristics and Emotional Exhaustion Due to the Stress Management Interventions?

Our hypotheses concerning the effects of the interventions on the changes in work characteristics and job stress called for a comparison of the participants' Time 1 and Time 2 scores on these variables. With this in mind, we conducted a separate analysis of covariance (ANCOVA) for each of these variables, with time (Time 1 vs. Time 2) as a within-participant variable and the number of work-directed interventions, person/work interface-directed interventions, person-directed interventions, and other interventions (i.e., four variables) as covariates. Preliminary analyses revealed that none of the second- and higher-order interactions among the four intervention variables on the one hand and time on the other hand reached significance. Thus, for simplicity only main effects of the intervention variables and their first-order interactions with time were included in these analyses.

Note that this type of analysis assumes that the observations are statistically independent. This assumption is violated in the present data set, as the participants were contacted through the organization they worked for. That is, the current data set consists of clusters of respondents working for the same organization, thus sharing the same work environment. Neglecting the two-level structure of the data may result in an inflation of alpha levels (Hox, 2002). In order to examine the degree to which this violation of the assumption of statistical independence biased the results, we conducted five preliminary ANOVAs (one for each work characteristic and one for emotional exhaustion), with organization (81 organizations) as a random between-participants factor. These analyses revealed that organization accounted for .02–.04% of the individual variance in the work characteristics. Although the effect of organization on the criterion vari-

ables was significant at $p < .001$ in all cases, these figures suggest that any bias resulting from neglecting the organizational level was unimportant. To be on the safe side and given the large sample size when conducting the individual-level analyses, we tested at $p < .01$ rather than at the conventional alpha level of $p < .05$. For the organizational-level analyses, the .05 alpha level was retained.

RESULTS

Research Question 1: To What Degree Did the Psychosocial Work Characteristics and Levels of Emotional Exhaustion Change Across Time?

The average scores of the employees of the 81 domiciliary care agencies on the four work characteristics examined in this study and emotional exhaustion, for both occasions, are presented in Table 2. This table shows that significant changes occurred during the 2.5 years in between the waves of the study for all four work characteristics and emotional exhaustion, overall $F(5, 63030) = 799.67, p < .001$ (all univariate F s were significant). At Time 2, the employees of the organizations reported lower exhaustion and lower job demands, as well as higher levels of skill discretion, decision latitude, and social support. Although the magnitude of these changes is quite small, they all point in the same direction: Working conditions seem to have improved during the study period.

Research Question 2: What Did Organizations Do to Reduce Job Stress?

About a quarter of the organizations ($n = 23, 28.4\%$) reported that they had implemented no interventions at all during the 2.5-year interval between the waves of the study. The other agencies implemented on average 19.5 ($SD = 9.8$) interventions; one of them reported that no fewer than 50 interventions had been implemented. The 7 most frequently implemented interventions for each of the four intervention types are listed in Table 1.

Of the participating organizations, 67.9% implemented at least one work-directed intervention. Many interventions in this cluster concern changes in the work design or increased worker participation. The most popular of these measures (implementation of new protocols; cf. Table 1)

Table 2. Means, Standard Deviations, and Correlations for the Key Variables Used in This Study, as a Function of Time (Individual Level)

Variable	Time 1 (N = 26,881)		Time 2 (N = 26,563)		F ^a					
	M	SD	M	SD		1	2	3	4	5
1. Job demands	2.47	0.60	2.22	0.53	2,973.34***	—	.00*	-.13***	-.14***	.37***
2. Skill discretion	2.53	0.48	2.64	0.48	763.33***	.00*	—	.33***	.30***	-.08***
3. Decision latitude	2.71	0.54	2.83	0.52	826.58***	-.16***	.28***	—	.28***	-.15***
4. Social support	3.89	0.73	3.98	0.69	249.81***	-.14***	.26***	.27***	—	-.20***
5. Emotional exhaustion	1.67	1.10	1.40	0.97	1,057.01***	.39***	-.09***	-.17***	-.21***	—

Note. Multivariate $F(5, 63030) = 799.67, p < .001$. Correlations for Time 1 are below the diagonal; correlations for Time 2 are above the diagonal.

^aFor all univariate F s, $dfs = 1, 63034$.

* $p < .05$. *** $p < .001$.

was taken in about a third of the organizations ($n = 29$, 35.8%). Thus, although two thirds of the participating organizations implemented at least one work-directed intervention, there were no measures in this cluster that were taken particularly often. The interventions in the cluster of person/work interface-directed interventions often concern better opportunities for schooling and training. These interventions were implemented somewhat more often than the work-directed interventions: 69.0% of the organizations implemented at least one such intervention, and the most frequently taken measure (the organization raised its budgets for education and training) was taken in 53.1% of the participating organizations. About two thirds of the agencies (64.3%) implemented at least one person-directed intervention. Many of the interventions in this cluster refer to improving the conditions of employment. The most frequently taken measure (tailor-made employee benefits) was taken in 48.1% of the organizations.

Finally, 69.0% of the organizations implemented measures that could not be classified as work-directed, person/work interface-directed, or person-directed interventions. These interventions often deal with providing employees with information about the company and about their work circumstances. The most popular of these concerned agreeing to conform to general guidelines and norms concerning physical workload in the domiciliary care sector (implemented by 59.3% of the organizations). Note that this measure *in itself* does not involve changes in work characteristics (if so, these are listed in the work-directed interventions) but rather that these organizations have indicated that they would like to comply with these guidelines and norms and that they regularly receive information about possible ways to reduce physical workload.

Further, we examined how often agencies implemented particular combinations of different intervention types. No fewer than 55 organizations (67.9%) implemented measures from at least three different clusters, whereas 23 organizations (28.4%) implemented no interventions at all. As might be expected, the correlations among the four variables representing the number of measures taken of each particular kind were high, ranging from .67 to .84 (all $ps < .001$). Thus, if organizations chose to address job stress, they tended to launch an all-out attack on job stress, combining different types of measures.

Research Question 3: Which Organizations Implement What Kind of Interventions?

Figure 1 presents the average number of interventions as a function of intervention type (i.e., directed toward the work environment, the person/

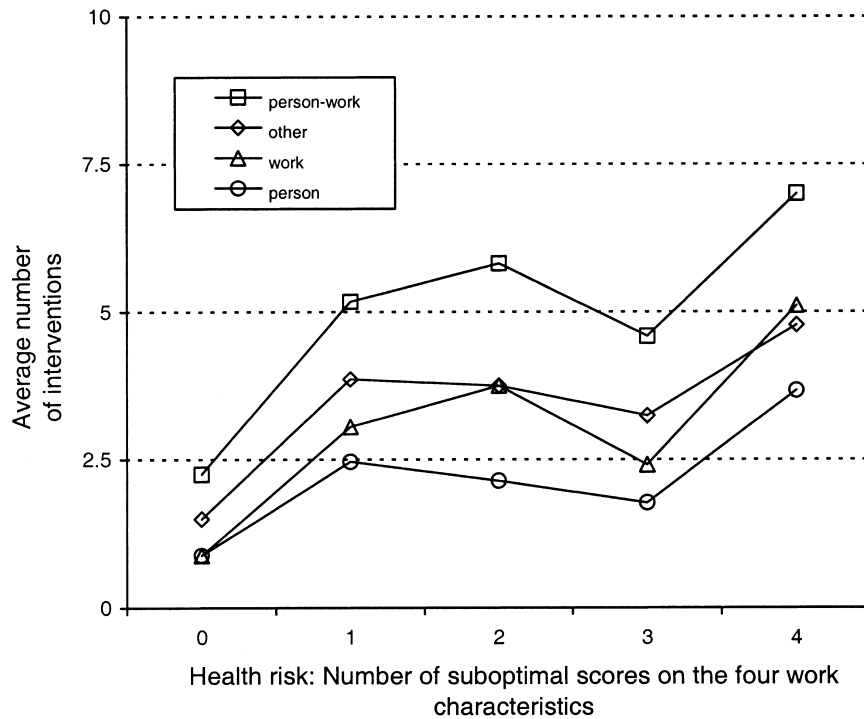


Figure 1. Number of stress management interventions as a function of intervention target and health risk, as measured at Time 1 of the study ($N = 81$ organizations).

work interface, the person, or other) and the work-related health risks in the organization, as determined by the number of suboptimal scores on the four key work characteristics. Figure 1 suggests that the association between the number of interventions and the work-related health risks is not linear. Although low-risk organizations (i.e., organizations without suboptimal scores on the four work characteristics) tend to implement fewer interventions than do high-risk organizations (i.e., suboptimal scores on all four work characteristics), the number of interventions reported by the three intermediary-risk organizations is about equal and in between the number of interventions reported by the low- and high-risk organizations. A MANOVA revealed a main effect for intervention type, $F(3, 74) = 17.6$, $p < .001$, showing that there were differences in the frequency with which the four types of interventions were applied. Person-directed interventions were implemented less frequently ($M = 2.2$, $SD = 2.2$) than were work-directed ($M = 3.2$, $SD = 3.1$), other ($M = 3.6$, $SD = 3.1$), and, in particular, person/work interface-directed ($M = 5.2$, $SD = 4.6$) interventions.

Further, the linear contrast on health risk was significant, $F(1, 76) = 5.0, p < .05$, as was the cubic contrast, $F(1, 76) = 4.3, p < .05$. These effects corroborate the impression that there is a nonlinear relationship between number of interventions and work-related health risks. Finally, the Health Risk \times Intervention Type interaction was not significant, $F(3, 74) = 1.1$, implying that the association between the average number of interventions and the level of work-related health risks did not vary as a function of intervention type. Thus, high-risk organizations implemented more interventions than especially low-risk organizations, and this conclusion holds up for all intervention types.

Research Question 4: To What Degree Are Across-Time Changes in the Four Work Characteristics and Emotional Exhaustion Due to the Stress Management Interventions?

The key question is whether the improvement in working conditions signaled in Table 2 was due to the measures that were taken. Hypotheses 1a–d (for the four work characteristics) and Hypothesis 3 (for emotional exhaustion) stated that organizations that implemented many interventions during the interval between the waves would effectuate stronger improvements in the criterion variables than would other organizations, whereas Hypothesis 2 (for the work characteristics) and Hypothesis 4 (for emotional exhaustion) stated that the effects of work-directed and person/work interface-directed interventions would be stronger than the effects of person-directed and other interventions.

Job Demands

The results of an ANCOVA with the number of work-directed, person/work interface-directed, person-directed, and other interventions as covariates and time (Time 1 vs. Time 2) as a between-participants factor are summarized in Table 3. This table reveals main effects of time and all four covariates. As was already shown in Table 2, the Time 1 scores on job demands were higher than at Time 2 ($M_s = 2.47$ and 2.22 , $SD_s = 0.60$ and 0.53 , respectively). The main effects of the four intervention variables merely signify that organizations with employees reporting high demands tend to implement more interventions of various kinds than do other organizations, which is consistent with the organizational-level findings presented in Figure 1.

Hypothesis 1a stated that organizations that implemented many inter-

Table 3. Results of Four Analyses of Covariance (One for Each Work Characteristic)

Work characteristic	R^2	F^a
Job demands	.05	
Time		989.80***
No. of work-directed interventions		22.82***
No. of person/work interface-directed interventions		85.48***
No. of person-directed interventions		16.32***
No. of other interventions		83.47***
Time \times Number of Work-Directed Interventions		24.90***
Social support	.01	
Time		67.07***
No. of work-directed interventions		28.84***
No. of person/work interface-directed interventions		73.65***
No. of person-directed interventions		31.01***
Time \times Number of Work-Directed Interventions		7.21**
Decision latitude	.02	
Time		292.48***
No. of person-directed interventions		73.58***
No. of other interventions		26.43***
Skill discretion	.01	
Time		211.40***
No. of work-directed interventions		13.59***
No. of person/work interface-directed interventions		26.94***
No. of person-directed interventions		19.46***
No. of other interventions		16.65***

^aThe *df* for the error term varies from 63,540 to 64,975 because of occasional missing values.

** $p < .01$. *** $p < .001$.

ventions would be more successful in reducing job stress than would other organizations. Regarding this hypothesis, we found a significant Time \times Number of Work-Related Interventions interaction effect. To interpret this effect, we trichotomized the variable representing the number of work-directed interventions with about equal numbers of participants in each category. The results are displayed in Figure 2A. As expected, this figure reveals that employees of agencies that implemented many (more than four) interventions tended to report a slightly stronger decrease in job demands than did employees of other organizations. Indeed, whereas at the first measurement of the study the difference among the three categories was substantial, $F(2, 32887) = 53.30, p < .001$, this difference was much smaller at Time 2, $F(2, 32,068) = 5.95, p < .01$. These results lend credit to the notion that work-directed interventions have been effective in reducing job demands (Hypotheses 1a and 2 supported).

Social Support

The results for social support are similar to those reported for job demands. There was a main effect of time (the participants received more

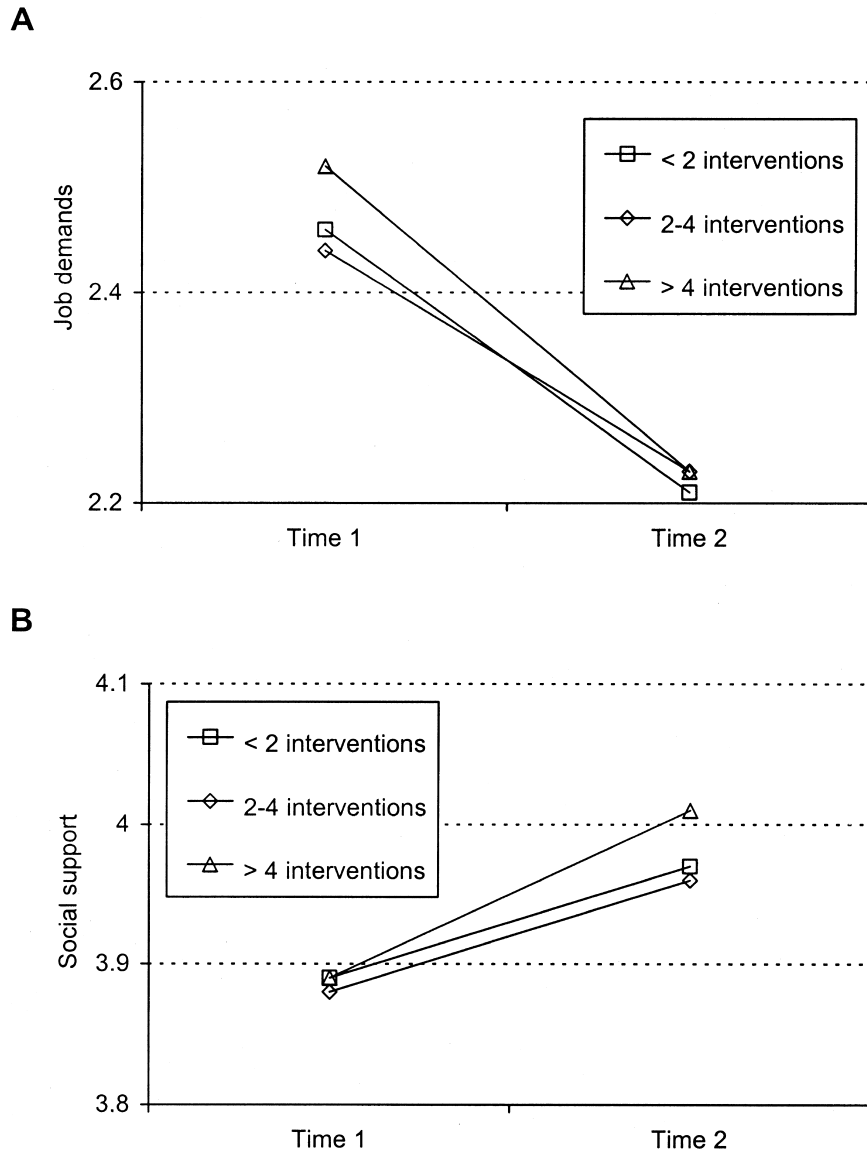


Figure 2. A: Job demands as a function of time and number of work-directed interventions. B: Social support as a function of time and number of work-directed interventions.

social support at Time 2 than at Time 1; cf. Table 2), and the main effects of the number of work-directed, person/work interface-directed, and person-directed effects signify that organizations with employees reporting low levels of social support tended to implement more of these types of

interventions than did other organizations. Again, the Time \times Number of Work-Directed Interventions was significant. Figure 2B shows that the differences among the three intervention groups were negligible at Time 1, $F(2, 32247) = 0.56$, whereas at Time 2 the employees of organizations that implemented more than four work-directed interventions reported considerably higher levels of support than did employees of other organizations, $F(2, 31995) = 18.96, p < .001$. These results thus suggest that work-directed interventions have positive effects on social support (Hypotheses 1b and 2 supported).

Decision Latitude/Skill Discretion

The results for decision latitude and skill discretion resemble those obtained for social support and job demands in that we found main effects of time and several intervention variables. Interpretation of these effects is straightforward: Levels of decision latitude and skill discretion increased significantly from Time 1 to Time 2 (cf. Table 2), and organizations whose employees reported low levels of decision latitude and/or skill discretion tended to implement more interventions than employees of other organizations. We found no interactions between time and any of the four intervention types (Hypotheses 1c–d and 2 rejected).

Emotional Exhaustion

These results lend some credit to the notion that work-directed interventions in particular may be effective in reducing job stress. An ANCOVA with the number of work-directed, person/work interface-directed, person-directed, and other interventions as covariates and time (Time 1 vs. Time 2) as a between-participants factor revealed main effects of time, $F(1, 64867) = 355.58, p < .001$ (levels of emotional exhaustion decreased strongly; cf. Table 2), and of the number of person/work interface-directed and other interventions. The latter two effects signify that agencies with employees that reported high levels of exhaustion tended to implement many interventions of various kinds. Regarding our hypotheses concerning the across-time development of emotional exhaustion, the main effect of time was moderated by the number of work-directed interventions, $F(1, 64867) = 10.71, p < .001$. The results are displayed in Figure 3. Employees of organizations that implemented many (more than four) interventions tended to report a stronger decrease in emotional exhaustion than did employees of other organizations. The result of this decrease is remark-

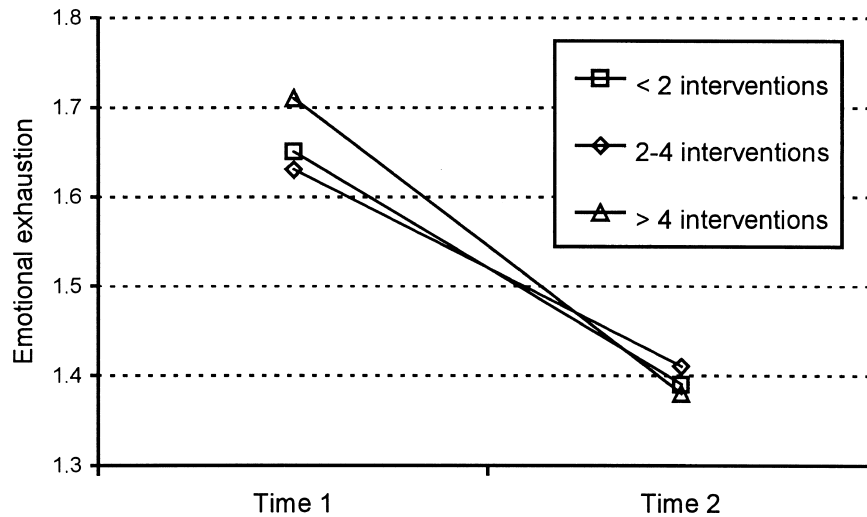


Figure 3. Emotional exhaustion as a function of time and number of work-directed interventions.

able. Whereas at the first measurement of the study, the difference among the three categories was substantial, $F(2, 32879) = 15.50, p < .001$, this difference disappeared at Time 2, $F(2, 31992) = 2.39, ns$. Again, this result supports the idea that work-directed interventions are successful in reducing job stress (Hypotheses 3 and 4 supported).

Organizational-Level Analyses

The analyses for the effects of the interventions on the four job characteristics and emotional exhaustion were conducted at the level of the individual participants. In principle, one would expect comparable results when analyzing the aggregated, organizational-level data. A major disadvantage of organizational-level analysis is that the number of observations is small ($N = 81$), resulting in low statistical power; the main advantage is that organizational-level analysis allows for within-organization (i.e., longitudinal) comparison, which was impossible for the individual-level data. In an attempt to corroborate the individual-level findings reported previously in which the organizational-level data were used, we conducted a series of ANCOVAs with time (Time 1 vs. Time 2) as a within-organization factor and the four intervention variables as covariates. The results of the organizational-level analyses were quite similar to the individual-level

analyses; the main difference was that the number of significant effects was considerably lower. Again, we found that the scores on social support, skill discretion, and decision latitude increased significantly across time, whereas job demands decreased across time (cf. Table 2).

Further, we found several main effects of the four intervention variables, indicating that organizations with relatively low scores on social support, skill discretion, and decision latitude and/or high scores on job demands tended to implement more interventions than other organizations (cf. Figure 1). Significant interactions between time and any of the four intervention variables were absent except for a Time \times Number of Work-Directed Interventions interaction effect for job demands, $F(1, 79) = 4.59$, $p < .05$. Organizations that implemented few work-directed interventions (fewer than three interventions) experienced a slightly smaller decrease in job demands ($M_s = 2.38$ and 2.19 , $SD_s = 0.14$ and 0.19 , for Time 1 and Time 2, respectively) than did organizations that implemented more work-directed interventions ($M_s = 2.46$ and 2.22 , $SD_s = 0.15$ and 0.10 , for Time 1 and Time 2, respectively; Hypothesis 1a was supported). Although this may not seem impressive, these across-time developments imply that the Time 1 difference between these two groups in their job demands had disappeared completely at Time 2: For Time 1, $F(1, 80) = 7.12$, $p < .01$; for Time 2, $F(1, 80) = 2.13$, *ns*. This result is consistent with the individual-level results. All in all, the organizational-level results were highly similar to the individual-level findings except that the organizational-level effects were less often significant because of lack of power.

DISCUSSION

Over the past 5 years, the Dutch government, trade unions, and employers' organizations have developed a unique initiative for dealing with job stress. Agreements were made concerning the reduction of job stress, involving large-scale risk assessments in various sectors of the labor market and allowing the participating organizations to compare their own scores with those of all other organizations in their sector. On the basis of this information, they could then address the specific work-related stress risks in their organization.

The present study evaluated the effects of this approach to reducing job stress in the domiciliary care sector. Our analyses revealed that during the 2.5-year study interval, levels of emotional exhaustion and job demands decreased and levels of emotional support, skill discretion, and decision latitude increased in the Dutch domiciliary care sector. During this interval, most of the participating organizations (71.6%) implemented a wide variety of measures designed to reduce job stress. Following DeFrank and

Cooper (1987), these measures were classified as work-directed, person/work interface-directed, person-directed, or other interventions. Work-directed interventions were somewhat less frequently implemented than the other three intervention types, which confirms previous notions that measures dealing with the organization of work are less popular among the management of organizations than other measures (Kompier, 2002; Semmer, 2003). Further, organizations with unfavorable scores on selected psychosocial work characteristics (as determined on the basis of the first round of data collection) implemented significantly more interventions than other organizations. Finally, a small part of the improvement in job demands, social support, and emotional exhaustion was accounted for by the work-directed interventions implemented by the participating organizations; other types of interventions did not affect changes in the criterion variables.

Study Limitations

The most obvious limitation of the present study is that the information available on the interventions did not allow for an evaluation of the quality of the implementation process: We know roughly what happened but not how this happened. Research on the course of successful stress prevention projects (e.g., Kompier et al., 2000) has revealed that process factors like (a) a proper preparation (e.g., division of tasks and responsibilities) and introduction (e.g., creating company support) of a stress prevention program within the organization, (b) worker participation (e.g., the involvement of employees in the choice and implementation of measures), and (c) top management support (i.e., commitment of the top management to the outcomes of a risk assessment) are all vitally important to the effectiveness of stress management interventions. Because of the lack of information on these factors, we could not distinguish between high-quality implementations and other implementations (cf. Giga et al., 2003; Kompier, in press; Kompier & Kristensen, 2001). It seems plausible that the effects of measures that have been taken with a high-quality approach will be stronger than those of other measures. This reasoning suggests that our findings present conservative, “baseline” estimates of the possible effects of various types of job stress interventions.

A second limitation is that the effects of the interventions implemented by the organizations in our study were not evaluated against a comparable comparison group. Although about a quarter of the organizations said that they had not implemented any interventions during the Time 1–Time 2 interval (suggesting that they could serve as an adequate reference), our analyses revealed that these organizations differed from the other organi-

zations in terms of their working conditions (cf. Table 2, which shows that these organizations were less likely to have suboptimal scores on the work characteristics included in this study). Thus, organizations were not randomly distributed across the intervention and the comparison groups. Further, the fact that the organizations in the comparison group did not implement any interventions during the observed interval does not imply that these organizations did not implement any stress management interventions at all (e.g., some organizations had implemented several of such measures shortly before the Time 1 wave of the study but had not implemented any other interventions since). Thus, these organizations were assigned to the comparison group. However, it seems plausible that possible beneficial effects of the interventions in these organizations would have become visible after the Time 1 measurement, resulting in an improvement on the criterion variables in this study at Time 2. This reasoning suggests that the intervention and the comparison groups actually differed less from each other than would have been desirable, thus underestimating the effects of the job stress interventions. Further, this reasoning may also account for the finding that both the intervention and the comparison groups showed considerable across-time improvements in the criterion variables (the work characteristics and emotional exhaustion); normally one would expect only the intervention group to change.

A third limitation concerns the fact that we were unable to test the notion that the combination of work-directed and worker-directed stress interventions may be more effective in reducing job stress than “stand-alone” interventions (Giga et al., 2003). Because of the context of the present study, interventions could not be implemented with a carefully balanced quasi-experimental design. As it turned out, organizations either implemented no interventions at all or many different types of interventions at the same time. Thus, we could not compare organizations implementing only work- or worker-directed interventions with organizations implementing both. Note that in practice, organizations often implement various measures simultaneously (cf. Kompier et al., 2000), meaning that this limitation is by no means unique to the present study.

A fourth limitation concerns the interventions included in the present study. Although the participating organizations implemented a wide range of interventions, these form a select subset of all possible measures that might be taken to reduce job stress. This is an important limitation because it explains why our results diverge in some respects from earlier findings. For example, in the present study person-directed interventions did not lead to stress reduction, whereas in Van der Klink et al.’s (2001) study, person-directed interventions were quite effective in reducing job stress. This difference is probably due to the type of interventions examined by Van der Klink et al.: Whereas they studied the effects of largely individual-

level interventions (e.g., cognitive-behavioral therapy, relaxation techniques, and the like), our study focused on a rather different class of person-directed interventions (see Table 1 for examples). Thus, it is not surprising that our results diverge from those of studies in which the effects of other types of interventions were examined, implying that the conclusions of the present research do not extend beyond the measures included in this study (of course, the same applies to all other studies examining the effectiveness of stress management interventions).

Implications and Lessons Learned

At the operational level, the results of the present study are limited to Dutch domiciliary care organizations. Nevertheless, we believe that at a more general level, they provide evidence regarding the effectiveness and, hence, efficiency of this and similar large-scale approaches to the reduction of job stress. This, in turn, leads to conclusions and lessons concerning the desirability and feasibility of such approaches.

We believe that the two most interesting findings of this study concern (a) the obvious willingness of organizations to improve the work conditions of their employees and (b) the effects of various types of interventions. As regards the willingness of organizations to improve work conditions, we found that more than 70% of the organizations in our sample implemented at least one (and often many more) interventions. Further, the fact that organizations with suboptimal scores on the four work characteristics included in this study were particularly active in addressing job stress suggests that (a) employers use the information they receive about the working conditions in their organization and (b) employers are willing to deal with job stress if they are convinced that this is necessary (i.e., that they perform less well in this respect than comparable organizations in the same branch). This reasoning thus suggests that the present large-scale approach to job stress reduction has at least the potential to be effective, as the participating organizations seemed quite motivated to put the information they received to good use.

At the same time, however, the actual effects of these efforts were quite weak. On average, we could explain only about 2% of the variation in the outcome variables (cf. Table 3). Although some may consider this figure disappointingly low, we feel that this does not imply that the stress management interventions studied in the present research were bereft of practical relevance. First, these low proportions of explained variance likely underestimate the effects of the interventions. As indicated earlier, the intervention and comparison groups may have been more similar than would have been desirable, and although we could not distinguish between

high- and low-quality implementation processes, both problems will have biased the effects of the interventions downward. In this sense, one might even consider the R^2 values reported in this study as quite encouraging instead of disappointing. Further, even if the interventions in the present study account for only a small part of the improvement in work characteristics and emotional exhaustion, that does not mean that they are irrelevant from an applied point of view. Given the size of the sample under study, even small decreases in emotional exhaustion or job demands may actually prevent large numbers of people from getting sick or becoming incapacitated for work, thus saving large—and very relevant—sums of money (cf. Frese & Zapf, 1994).

This reasoning does not imply, however, that all effort and money spent in designing and implementing the job stress interventions in our study have been used effectively and that there is no room for improvement. We would like to make two recommendations. First, it is of some importance to ensure that job stress interventions are implemented using a quality approach. There is considerable consensus among experts on the elements of such an approach (e.g., regarding a proper preparation, worker participation, and top management support; cf. Heaney, 2003; Kompier, 2002), and it would seem reasonable to ask that the parties involved act in line with these guidelines to maximize the effectiveness of these interventions. One practical recommendation might be that the parties that fund particular interventions be made aware of the “right” way of implementing interventions to prevent them from spending money on projects that are unlikely to yield the desired results.

Second, not all measures taken by organizations were equally effective in reducing job stress. As expected, work-directed interventions showed the most consistent effects on job stress. Although other types of interventions might have been effective if implemented well, this finding suggests that work-directed interventions in particular are likely to result in improvements of psychosocial working conditions and job stress and, thus, that this type of intervention should be considered first when organizations wish to reduce job stress. It would be helpful if funding parties would be aware of the fact that not all interventions are equally likely to lead to job stress reductions. To be sure, the non-work-directed interventions included in the present study are not necessarily ineffective or a waste of money (as stated earlier, there are good reasons to believe that the present study underestimated the effects of the interventions), but the work-directed interventions were clearly more effective than the other interventions. Further, it would seem possible that the combination of work-directed and other types of interventions (especially the interventions based on the person/work interface) facilitated the effects of the work-directed interventions (cf. Giga et al., 2003). As the organizations in our sample usually

combined work-directed interventions with other types of interventions, we could not test the assumption that work-directed interventions are especially effective when combined with other types of interventions. Thus, for the time being there seems no reason to write off non-work-directed interventions, even if work-directed interventions are more effective.

The goal of the present study was to provide some insights into the effectiveness of large-scale stress intervention projects in a particular sector of the labor market. Our findings show that this approach succeeds in motivating organizations to deal with job stress but that motivation in itself is insufficient to make this approach a success. The funding parties should be made aware of the possible effects of different types of interventions (not everything that is being sold as a stress management intervention may be worth its salt), and they should realize that designing an intervention is only half the work: Its implementation deserves at least as much attention and care. In this sense, the present study provides clear indications on how the effectiveness of the present and similar large-scale approaches to job stress reduction may be turned into successes—not only in terms of parties' motivations but also in terms of job stress reduction.

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