Psychosocial interventions in workplace mental health promotion: an overview

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SUMMARY

A review based on the DataPrev final report concerning workplace mental health promotion is presented. Out of 4865 studies identified in a comprehensive bibliographical data search, 315 were selected for abstract screening and 79 were included in the final review. The studies were categorized in terms of their aims/expected outcomes and evaluated for quality on the grounds of their design and type of analysis. The most frequent aims were stress reduction and better coping, followed by increased job satisfaction and effectiveness, mental health enhancement and reduction in mental health-related absenteeism. In the 79 intervention studies, 99 outcome variables were measured using 163 instruments, mostly developed for the study purposes. Different intervention categories turned out to be used to attain the same aim, with skills training being the most popular (other approaches included improvement of occupational qualifications and working conditions, physical exercise, relaxation and multicomponent interventions). Among the few intervention programs that were implemented and evaluated in two or more studies, the Stress Inoculation Training (Cecil and Forman, in Effects of stress inoculation training and co-worker support groups on teachers' stress. Journal of School Psychology, *28, 105, 1990) based on the model by Meichenbaum (Meichenbaum, in* Stress Inoculation Training. *Pergamon Press, New York, 1985) seemed to be the most promising. Its effectiveness, evidenced in a majority of the measures, was evaluated in studies using the randomized controlled design. This paper is illustrated by high-quality intervention studies. In high and moderate quality studies, positive effects were reported in about a half of the examined outcome variables. However, conclusive evidence of intervention programs effectiveness would require further research—repetition of studies using treatments equivalent to the experimental ones, and outcome evaluation taking into account other criteria, e.g. behavioural.*

Key words: mental health promotion; workplace

INTRODUCTION

Occupational stress and work-related mental health problems have a number of major socio-economic consequences such as absenteeism, labor turnover, loss of productivity and disability pension costs (Palmer and Dryden, 1994). Personal costs include lower self-esteem, somatic conditions (e.g. heart disease) and negative impact on family life (Goodspeed and DeLucia, 1990). Therefore, workplace is considered to be one of the most important settings for mental health promotion.

Interventions aimed at employees' mental health protection include—at the organizational level—working conditions improvement and work schedule changes. At the individual level, stress management and skills training programs

may provide the participants with resources helping them to cope with the detrimental impact of work-related problems.

Workplace programs implemented in various countries have been reviewed by many authors [e.g. (Van der Klink *et al.*, 2001; Edwards and Burnard, 2003; Ruotsalainen *et al.*, 2006)]. However, a majority of reviews are focused either on a specific intervention type (stress management being the most popular) or on interventions designed for a specific occupational group (e.g. mental health professionals). The aims of the Work Package 4 DataPrev Project were to identify and document evidence-based programs that promote mental health and prevent mental and behavioral disorders at workplace. This included identification of programs currently implemented, appraising the evidence they provided, and identifying best practice programs. In this paper, based on the WP4 DataPrev Project final report (Czabała and Charzyńska, 2010), an attempt was made at a comprehensive review of mental health promotion interventions applied in the workplace, to provide evidence-based knowledge about effective approaches in this area.

METHODS

Inclusion and exclusion criteria

The review included interventions provided in work settings that addressed a mental health outcome and targeted people in paid employment regardless of their age, hours worked, function and type of contract—permanent or temporary (also the self-employed). The study design included a control condition. The reviewed studies were conducted in the years 1988–2009 and had to be published in English. No studies concerning pharmacological interventions and populations on a long-term sick leave or returning to work from unemployment were taken into account; neither were dissertations.

Inclusion of interventions designed for different professionals of different ages and performing may influence generalization of the results. Some evidence suggests that the effects of specific interventions may be limited to particular groups of workers and not necessarily applicable to others.

Search strategy

The comprehensive strategy comprised search of nine electronic bibliographic databases: *PsycInfo, Embase, Medline, CINHAL, ERIC, Social Services Abstracts, Sociological Abstracts, Cochrane Occupational Health Field database and Cochrane Database of Systematic Reviews.* Moreover, websites of the following institutions were searched to identify relevant publications: the (British Occupational Health Research Foundation) (http://www.bohrf.org.uk), the Finnish Institute of Occupational Health (http://www.ttl.fi/internet/english), the National Institute of Occupational Safety and Health (NIOSH, USA) (http://www.cdc.gov/niosh), NICE (http://www.nice.org.uk), ProMenPol website (http://www.mentalhealthpromotion.net) and WHO (http://www.who.int/en). Reference lists from published meta-analyses and book chapters were also scrutinized. Finally, references provided by researchers working in the field were included.

Keywords used in the search strategy focused on work settings (e.g. worksite, workplace, occupation, work-related, job), intervention (e.g. program, training course, counsel, manage), study design (e.g. randomized controlled trial, random allocation and clinical trial), problems addressed (e.g. stress-related, distress, depression, anxiety and burnout) and outcome (e.g. well-being, quality of life, social skills, self-efficacy, happiness, motivation and empowerment).

Selection process and search results

Titles and abstracts identified during the search were examined for relevance, then full text of such publications was retrieved and verified in terms of the inclusion criteria. The selection process was carried out independently by a second researcher on a randomly selected sample of abstracts.

Out of 4865 studies identified during the searches, 315 publications were selected after the abstract screening. Further 236 text studies were subsequently discarded as not meeting one or more of the inclusion criteria. Full texts were retrieved for 79 studies finally included in the review [(for references, see (Czabała and Charzyńska, 2010)]. Table 1 presents a summary of the included papers; for a list of

Table 1: Summary of the 79 studies included in the review

Author (year), country	Study type	Intervention approach	Population	Instruments/indicators	Intervention outcome
1. Deahl M et al. (2000), UK	CCT	Group Psychological Debriefing	Male soldiers	HADS, PTSS-10, IES, SCL-90	Reductions in HADS and SCL-90 scores at various sampling points
2. Eklöf and Hagberg (2006), Sweden	RCT	Feedback intervention	VDU workers	Mood adjective checklist, self-developed questionnaire	Positive effect on social support measured as a group characteristic
3. Eriksen et al. (2002), Norway	RCT	Physical exercise, SMT Integrated Health Program	Post office workers	Cooper job stress questionnaire, SHC,	No effects on subjective health complaints or job stress
4. Roger and Hudson (1995), study 2., UK	CCT	Stress Management	Police officers	Mean absenteeism figures	Effective reduction in absenteeism rates
5. Roger and Hudson (1995), study 3., UK	CCT	Stress Management Training	Constables	CSQ, Self-report of absenteeism	Trainees equipped to manage change more effectively
6. Arnetz (1996), Sweden	CCT	Relaxation	Police officers	Self-developed questionnaire measuring stressors	Reduction in biological indicators of stress levels
7. Payne and Manning (1990), Greece	CCT	*Stress Inoculation Training*	Teachers	Survey of Feelings about Teaching (SFAT)	Reduction in anxiety and stress related to teaching
8. Bond and Bunce (2001), UK	CCT	*Participative Action Research (PAR)*	Administr. employees	OSl, Job Content Questionnaire	Improvement in mental health, and self-rated performance
9. Sjogren et al. (2006), Finland	RCT	The physical exercise intervention	office workers	Measurements on visual rating scales	Increase in subjective physical well-being. No effect on mental stress
10. Pryce et al. (2006), Denmark	CCT	*Open-rota system.* The participatory approach	Psychiatric nurses	Copenhagen Psychosocial Question. self-rated health	Increases in work-life balance, job satisfaction, social support
11. Zołnierczyk-Zreda (2004), Poland	CCT	*Stress management workshop*	Teachers	Psychosocial Working Conditions Questionnaire, MBI, the Widerszal-Bazyl questionnaire	Decrease in emotional exhaustion, workload and somatic complaint. Increase in behavioral job control
12. Zołnierczyk-Zreda (2002), PL	RCT	*Stress management intervention*	Bank workers	CISS, the Bradburn questionnaire	Significant increase in positive coping style levels
13. Innstrand et al. (2004), Norway	CCT	*Improving working schedule & physical exercises*	Health staff	GBQ, job satisfaction scale, stress measures	Reduction in stress and exhaustion, a strong significant rise in job satisfaction
14. De Jong and Emmelkamp (2000), Holland	RCT	*Multicomponent Stress Management Training*	Various workers	STAI-T, PCQ, GHQ, SRLE, SSI, SIB, UCL, OSQ	Improvement with regard to trait anxiety, psychological distress, unassertiveness
15. Dupuis and Struthers (2007), 1, Canada	RCT	*Social Motivational Training (SMT)*	Working students	Cognitive and affective variables, Weiner's model	Increase in perceived prosocial cognitions and behavioral intentions
16. Dupuis and Struthers (2007), 2, CA	RCT	*Social Motivational Training (SMT)*	Working students	Cognitive and affective variables, Weiner's model	More perceived prosocial cognitions, affect and behavioral intentions
17. Dupuis and Struthers (2007), 3, CA	RCT	*Social Motivational Training (SMT)*	Working adults	Number of participants who took a flyer	Workers more likely to take a brochure on conflict management workshop
18. Dupuis and Struthers (2007), 4, CA	RCT	*Social Motivational Training (SMT).*	Working students	Cognitive and affective variables, Weiner's model	Participants exhibited a more prosocial coworker profile in some dimensions
19. Gardner et al. (2005), UK	RCT	*A cognitively based stress management training*	Clinical staff	GHQ-12, MHPSS, EPQ-R, WOC	Reduction in symptom ratings in those who had clinically significant GHQ scores
20. Frayne et al. (2000), USA	CCT	*Self-management training*	Sales people	Measures developed for this study	Behavior, self-efficacy and outcome expectancy measures improved
21. Galinsky et al. (2000), USA	RCT	*Rest break schedules*	Data-entry operators	Questionnaires developed for this study	Discomfort in several areas of the body were significantly lower

22. Gardiner *et al.* (2004), Australia	CCT	*Cognitive behavioural stress management training*	GPs	QPASS, GHQ	Decrease in general psychological distress
23. Nielsen *et al.* (2006), Denmark	CCT	*A participative approach*	Canteen workers	COPSOQ, cognitive stress reactions scale, SF-36	Improvements in working conditions and well-being in one experimental and one control group
24. Van Weert *et al.* (2005), Holland	CCT	*Snoezelen*-new 24-h care model	Nursing assistants	VBBA, NSPP-DC-NIVEL , NSPP-SB-NIVEL, GHQ, MAS-GZ, MBI	Improvement in quality of life, decrease in time pressure, fewer stress reactions and less emotional exhaustion
25. Larsson *et al.* (1990), Sweden	CCT	*Stress control program*	Teachers	Stress Profile, Faces scale, Hassles and Uplifts Scale	Fewer perceived stressors, positive reappraisal, seeking social support
26. Rebergen *et al.* (2007, 2009), Holland	RCT	GBC (guideline based care) for occup. psysicians	Police workers	Return to work, health care costs	No effect of earlier return to work or productivity loss costs. Lower health care costs
27. Mikkelsen *et al.* (2000), Norway	RCT	*Short-term participatory intervention*	Health workers	Cooper's Job Stress Question., UHI, Job Content Question., Work Apgar Question. LCQ	A limited effect on work-related stress, job characteristics and learning climate
28. Mikkelsen and Gundersen (2003), Norway	CCT	*Participatory Organizational Intervention*	Postal workers		A positive effect on the learning climate, job stress and health complaints
29. Zołnierczyk-Zreda (2004), Poland	RCT	*Mindfulness-based cognitive intervention*	Managers	OSI-2-Occupational Stress Indicator	A significant decrease in perceived job stressors
30. Martin and Sanders (2003), Australia	RCT	*Work Place Triple P Group (WPTP)*	University staff	ECBI, DASS21, PSBC, PS-Parenting Scale, SSS	Lower levels of dysfunctional parenting practices, higher levels of self-efficacy
31. Razavi *et al.* (1993), Belgium	RCT	*Psychological training program*	Oncology nurses	SDQ, NSS-nursing stress scale	Reduced level of occupational stress related to an inadequate preparation
32. Razavi *et al.* (1988, 1991), BE	CCT	*Psychological training*	Medical staff	SDQ-Semantic differential questionnaire	When the subjects are considered globally, there are no concepts changes
33. Polacsek *et al.* (2006), USA	CCT	*Move & improve, a worksite wellness program*	Various worksites	Lifestyle factors (developed survey)	Substantial improvements in lifestyle factors
34. Waite and Richardson (2004)	RCT	*Personal resilience and resilient relationships training*	Government employees	Spirit Core Scale, Purpose in Life Test	Positive change in resilience, self-esteem, locus of control, interpersonal relations
35. Schrijnemaekers *et al.* (2003), Holland	RCT	*Emotion-oriented care*	Caregivers for elderly	Maastricht Work Satisfac. Scale, MBI	Modest positive effects on some aspects of job satisfaction and burnout
36. Smoot and Gonzales (1993), USA	CCT	*Interpersonal communication skills training*	Psychiatric staff	MBI, Ward Atmosphere Scale	Staff members felt the training improved their way of responding to patients
37. Slaski and Cartwright (2003), UK	CCT	*A developmental EI training program*	Managers	Bar-On, GHQ-28,	Increase in emotional intelligence, no impact on performance
38. Holt and Mar (2006), Australia	RCT	Educational, mailed intervention	GPs	GHQ-12	Effective in reducing psychological morbidity
39. Grime (2004), UK	RCT	Interactive, computerized CBT program	Health employees	HADS, Attribution Style Questionnaire	Lower depression and negative attributional style scores at post test, not signif. at 3 months
40. Van der Klink *et al* (2003), Holland	RCT	Three-stage model resembling stress inoculation training	Postal employees	4DSQ, SCL-90, duration of sickness leave	Reduction in the negative consequences of the occupational dysfunctioning
41. Melchior *et al.* (1996), Holland	CCT	An innovation in nursing care delivery	Psychiatric nurses	Maslach Burnout Inventory	Primary nursing had an influence on the burnout level among psychiatric nurses
42. Ewers *et al.* (2002), UK	RCT	Psychosocial intervention training	Forensic nurses	Measures developed by the first author, Maslach Burnout Inventory	Nurses more positive in their attitudes towards the clients, experience less neg. stress effects

Continued

Table 1: *Continued*

Author (year), country	Study type	Intervention approach	Population	Instruments/indicators	Intervention outcome
43. Delvaux *et al* (2004), Belgium	RCT	The psychological training program	Oncology nurses	NSS, SDQ, EORTC CLQ-C3, SIAQ	Stress reduction, attitudes towards oneself and patients moved towards a positive pole
44. Bittman *et al* (2003), USA	RCT	*Recreational Music—Making*	Community employees	Maslach Burnout Inventory	Reduction in burnout and mood dimensions, as well as Total Mood Disturbance
45. Anderson *et al* (1999), USA	RCT	*Meditation*	Teachers	Teacher Stress Inventory—TSI, STAIA, Maslach Burnout Inventory	Reduction in teachers' perception of stress, state & trait anxiety and burnout levels
46. Ayres and Malouff (2007), Australia	RCT	Multistep problem-solving model	Flight attendants	PANAS, MFFJSS, SWLS	Increase in problem-solving skills and problem-solving self-efficacy
47. Cecil and Forman (1990)	RCT	*Stress Inoculation Training*	Teachers	TSI, TAOS, Job Stress in the School Setting	Reduction in teachers' self-reported stress and enhancement of coping skills
48. Teri *et al.* (2005)	RCT	dementia-specific training program for direct care staff	Assisted living employee	GDS, CAS, RMBPC, ABID, NPI, SSCQ	Training was successful in reducing the level of resident affective and behavioral distress
49. Rowe (1999), USA	RCT	*Stress management/adaptive coping training*	Health care employees	STAI, SAI, GSS, Psychological Well-Being Scale, MBI	After training less burnout experienced, no effect after 6 months
50. Park *et al.* (2004), USA	CCT	*An employee problem-solving team 'ACTion Team'*	Stores employees	SF-36, adapted scales	Positive effects on job stress and health status
51. Maes *et al.* (1992, 1998), Holland	CCT	*Working conditions and lifestyles changes*	Manufacture Workers	Wellness at Work Interview, SCL-90, biomedical measure, EMPLOS	Positive change in health risk, absenteeism reduction, no change in stress reactions
52. Cohen-Katz *et al.* (2004, 2005a), USA	RCT	*Mindfulness-based stress reduction*	Nurses	MBI, BSI, MAAS, Evaluation Questionnaire	Reduction in burnout level
53. Rahe *et al.* (2002), USA	RCT	*A Novel Stress And Coping Workplace Program*	Manufacture workers	SCI, STAI), Trait Form, Y-2, QHRQ	Improvement on the stress, anxiety and coping measures
54. Mueser *et al.* (2005), USA	RCT	*Skills training*	Services workers	Workplace Fundamentals Knowledge Test	No improvement on work outcomes for clients who were receiving supported employment
55. Maddi *et al.* (1998), USA	RCT	*The hardiness training, the relaxation/meditation training*	Managers	Personal Views Survey, Hopkins Symptom Checklist	Hardiness training effectively increasing hardiness, job satisfaction, social support
56. Macan (1996), USA	CCT	*The time-management training*	Social serv. employees	TMB, job-induced tension scale, somatic tension scale	No increase in more frequent time-management behaviors
57. Iwi *et al.* (1998), UK	CCT	Cognitive analytic therapy counseling	Estate office staff	GHQ-12, Occupational Stress Indicator (OSI)	No evidence of treatment effects on symptomatology
58. Hatinen *et al.* (2007), Finland	CCT	*The traditional and participatory intervention*	White-collar staff	MBI-GS, Job Diagnostic Survey	Both intervention improved workplace climate. Par. intervention more effective for burnout reduction
59. Bunce and West (1996), UK	CCT	*Stress Management And Innovation Promotion Program*	Health care staff	GHQ, JIT, Propensity to Innovate scale, SEQ	Traditional interventions improved general psychological strain and job satisfaction; Innovative: work-related stress
60. Lucini *et al.* (2007), Italy	CCT	*Stress Management And Sham Program*	White-collar staff	Self-developed question. measuring stress, autonomic evaluation	Both stress-related symptoms and signs of autonomic deregulation were reduced
61. Logan and Ganster (2005), UK	RCT	*Control intervention to alleviate job-related stress*	Trucking comp. staff	Somatic Complaints Scale, Job Diagnostic Survey	The intervention had no main effects on either control or stress-related outcomes
62. Heron *et al.* (1999), UK	CCT	*Stress management workshop*	Pharmaceutical staff	GHQ-30, CSS, OSI, MSS, a modif. life-events question (LES)	Better understanding of the principles of the management of stress and coping strategies

63. Gerzina and Drummond (2000), Australia	RCT	Cognitive skills training, relaxation	Police officers	State-Trait Anger Expression Inventory, MAI, the belief scale	Reduced scores on a majority of the anger measures, decrease in general anxiety
64. Rose *et al.* (1998), UK	RCT	*Stress management program*	Direct care staff	Adaptive Behavior Scale, Thoughts and Feelings Index	Reduced levels of anxiety and depression can have a positive impact on work performance
65. Bourbonnais *et al.* (2006), Canada	CCT	*Participative Intervention*	Clinical care staff	JCQ, PSI, Copenhagen Burnout Inventory, NHP	Improvement in the means of all psychosocial factors except decision latitude
66. Carson *et al.* (1999), UK	RCT	*The social support intervention*	Psychiatric nurses	DCL Scale, GHQ-28, MBI, Rosenberg Self-Esteem Scale	No significant reduction in stress and burnout in mental health nurses
67. Freedy and Hobfoll (1994), USA	CCT	*Dual Resource Intervention*	Acute care nurses	SSQ, Mastery Scale, CES-D, Emotional Exhaustion Scale, MBI	Enhancements in social support and mastery compared with no intervention group
68. Freedy and Hobfoll (1994), USA	CCT	*Single Resource Intervention*	Acute care nurses	SSQ, Mastery Scale, CES-D, Emotional Exhaustion Scale, MBI	A slight enhancement in mastery compared with the no intervention group
69. Kerr and Vos (1993)	CCT	*Employee Fitness Program*	White-collar staff	General Well-being Questionnaire, Cox and Gotts 1988)	Decrease in absenteeism. No significant differences in self-confidence
70. Kawakami *et al.* (2006), Japan	RCT	*Web-based supervisor training*	Sales service staff	Brief Job Stress Questionnaire (BJSQ)	No reduction in job stressors, improvement in friendliness of the worksite atmosphere
71. Landsbergis and Vaughan (1995), USA	CCT	*Participatory action research*	Clerks, managers	JCQ, Job Diagnostic Survey, Work Environment Scale	Limited evidence that improvements in job satisfaction crucial for better group functioning
72. Leonard and Alison (1999), UK	CCT	*Critical Incident Stress Debriefing*	Police officers	Coping Scale of Carver, the State-Trait Anger Expression Inventory	A significant reduction in anger levels and greater use of adaptive coping strategies
73. Lindquist and Cooper (1999), UK	RCT	*Stress management Program*	Taxation office staff	OSI, lifestyle measures, systolic and diastolic blood pressure levels	No improvement in stress and health indicators at post-program
74. Mino *et al.* (2006), Japan	RCT	*Stress-Management Program*	Manufacture workers	Uehata Stress Questionnaire, GHQ-30, CES-D	Improvement in depressive symptoms was observed
75. Murphy and Sorenson (1988), USA	CCT	*Biofeedback, Muscle relaxation*	Blue collar workers	Annual absenteeism, employee performance evaluations	Lower absenteeism and higher attendance ratings in those attending relaxation only
76. Nhiwatiwa (2003), UK	RCT	Booklet on trauma and coping mechanisms	Nurses	Impact of Events Scale, GHQ-28	A significant difference in distress scores, with education group showing greater distress levels
77. Pelletier *et al.* (1999), USA	RCT	*Stanford Training Regarding Effective Stress Solutions*	Bank employees	Stanford Job Strain Survey, Brief Symptom Inventory (BSI)	No change in wellness or stress level, improvement on anxiety scale
78. Peters and Carlson (1999), USA	RCT	*Strategy for health behavior change*	Maintenance staff	Health risk appraisal, MHLC, STPI, HABS	Improvement in physical, behavioral, psychological/attitudinal, emotional aspects
79. Shimazu *et al.* (2006), Japan	CCT	*Stress Management Program*	Engineers	BSCP, Brief Job Stress Questionnaire (BJSQ)	Better knowledge and improved coping skills. Adverse intervention effect on psych, distress

full references to these papers see the Supplementary material online.

Review procedure

For each study, a data extraction form provided by the Dataprev project was used, with the following categories: intervention characteristics (objectives/goals, intervention level, provider, frequency and duration, settings), study design (population, number of experimental and control groups, variables measured, measurement methods and statistical analysis), results (outcomes and conclusions).

No attempt at a meta-analysis was made due to heterogeneity of the reviewed studies in terms of populations targeted, outcome variables and measures used. Instead, workplace mental health promotion interventions were first, systematically described at a general level, and secondly, rated as having a 'high', 'moderate' or 'low' quality, and described in more detail. At both these levels, mental health promotion interventions categorized in terms of their aims/expected outcomes were analyzed separately.

RESULTS

General description of intervention studies

The analyzed interventions were implemented at three different levels: individual, organizational or both. The majority of interventions (52 studies) were implemented at the individual level, 19 at both levels and 8 studies dealt with the organizational level only.

Intervention aims

Interventions differed with regard to the number of their goals. The majority of interventions aimed at either one or two goals (28 and 24 studies, respectively), while only three aimed at five or more objectives. Due to the multiplicity and ambiguity of aims, on the grounds of intervention content only one primary goal per study, the one most related to mental health, was taken into account in further analyses, even if the authors had proposed more aims.

Intervention studies were categorized by their aims and allocated to appropriate thematic groups. The following five groups were distinguished and the percentage of studies in which particular aims were the desired outcome is given in the brackets:

(1) stress reduction or better coping with stress (37% of studies);
(2) mental health improvement, maintenance, enhancement (16%);
(3) increased job satisfaction: prevention of work overload and burnout, improvement of job attitudes and reduction in co-worker conflicts (18%);
(4) job effectiveness improvement (23%);
(5) reduction of absenteeism, sick leave and turnover rates (6%).

While the first three groups of aims are directly related to mental health, the last two categories (job effectiveness and reduction in absenteeism related to mental health problems) are associated rather with occupational activities and can be regarded only as an indirect outcome of effective mental health promotion.

A qualitative analysis of intervention programs shows that the same aim can be achieved using various intervention approaches. For example, the aim of stress reduction was set forth in 25 different intervention programs such as stress awareness heightening, or general health enhancement.

Only few interventions were used in two or more studies: the *Stress Inoculation Training* (Meichenbaum, 1985) was used as the theoretical and practical basis of three different interventions: *cognitive self-instructions* (Payne and Manning, 1990), *stress inoculation training* (Cecil and Forman, 1990) both implemented among teachers and *dual* or *single resource intervention* (Freedy and Hobfoll, 1994) addressed to nurses. Three other interventions were used twice: *The Basic Stress Management Course* implemented by Roger and Hudson (1995) in two different groups among constables and police officers , and a *Short-term Participatory Organizational Intervention* applied in two studies by Mikkelsen *et al.* (Mikkelsen *et al.*, 2000; Mikkelsen and Gundersen) to health care professionals and employees of a postal service sorting terminal. The final example is the *Psychological Training Program (PTP)*, described by Razavi *et al.* (Razavi *et al.*, 1988, 1991, 1993), who in one study implemented the intervention among medical or paramedical staff, and in another among oncology nurses.

Intervention categories

Using content analysis, workplace interventions were categorized into the following six groups:

(1) Skills training—broadly defined knowledge about stress and coping, training of mostly social skills such as stress and occupational stress management, problem-solving, communication and cognitive skills;
(2) Improvement of occupational qualifications—job-specific knowledge and skills;
(3) Working conditions improvement—modification of external workplace characteristics such as working time, work organization, schedule and strategies or employee—employer relationships;
(4) Relaxation—physiological aspects of occupational functioning and coping with stress, e.g. progressive muscle relaxation;
(5) Physical exercise—health and physical fitness enhancement by various sports disciplines, e.g. swimming, walking, aerobic;
(6) Multicomponent intervention—a number of different interventions implemented within one program.

Table 2 presents the detailed techniques/methods used in implementation of each of the intervention categories.

A qualitative analysis shows that the same techniques, e.g. education or group work, were used in various interventions (Table 2).

The most frequent and comprehensive intervention category was skills training implemented by means of cognitive, communication and daily life skills development, job stress management and problem-solving. Cognitive and cognitive-behavioral theories provided the main rationale for intervention programs. Regrettably, not too many programs were theory-driven.

Intervention characteristics: duration, frequency, providers, population targeted

In Table 3, the majority of interventions were provided no longer than 16 weeks, with the most popular session frequency once a week.

Qualifications of intervention providers usually described as psychologists, psychotherapists or trainers were not specified. The study author(s) conducted some interventions, which suggests the implementers' very high qualifications, but is a methodological drawback to the quality evaluation.

Participants in the interventions were predominantly white-collar workers, mental health professionals and health care providers—perhaps the latter are regarded as a group at the highest risk for mental health problems.

Study design

In a majority of the analyzed intervention studies randomized controlled trials were reported. The most common research design was a comparison of an experimental group submitted to an intervention with a single no- or delayed-intervention control group (59 studies). Twelve studies included 2 experimental groups and 1 control group.

At baseline the investigated variables were assessed in all the reviewed studies, with a single post-intervention measurement in the

Table 2: Methods and techniques of the interventions

Intervention category	*n*	Techniques
Skills training	35	Lectures, books, discussion, role playing, compiling a list of problems or stress factors, problem mapping, problem-solving, goal setting, feedback
Improvement of occupational qualifications	13	Lectures, discussion, role playing, problem identification, problem-solving, improvement of knowledge and skills
Working conditions improvement	6	Change in duration and frequency of breaks, implementation of friendly working conditions, analysing and increasing awareness of worksite and occupational stress factors, work strategy reorganization
Relaxation	6	Group exercises, lectures, progressive muscle relaxation, autogenic training, playing music
Physical exercise	2	Group physical exercises, e.g. aerobic, information about well-being
Multi-component intervention	17	Several components of the intervention program: information about health, stress, worksite and cognitive coping skills, physical exercise, body relaxation, specific communication skills

Table 3: Basic characteristics of the interventions

Session frequency	Number of interventions	Session duration	Number of interventions
More than weekly	8	≤2 h	17
Weekly	24	>2 h	16
Once a fortnight or less	1	Not specified	47
Single session	4		
Irregularly	4		
Not specified/not clear	38		

Occupation of intervention recipients	Number of interventions	Intervention providers	Number of interventions
Mental health professionals	10	Physiotherapists	3
Healthcare professionals	15	Psychologist(s), psychotherapist(s),	15
Teachers	7	Trainer(s)	8
Other white-collar workers	20	Intervention author(s)	13
Blue-collar workers	2	Stress management instructor(s)	1
Armed forces	6	Others: experienced personnel, etc.	16
Various employees (different worksites, different occupations)	14	Not specified	23
Not specified	5		

majority of cases (52). Moreover, in 27 studies one or more follow-ups were carried out besides the assessment directly after the intervention.

Variables and measures

In 79 studies included in the DataPrev overview 99 different variables were measured using 169 instruments. Among the most often studied outcome variables were stress reactions (23 studies), subjective mental health (19), coping strategies and styles (15), anxiety (9), job satisfaction (9), burnout (8) and stressors (7).

Different measurement methods were used, including self-report questionnaires, rating scales or psychometric instruments, life data and physiologic measures. Only 19 of the measures were used in more than one study. In that number the most popular were: *Maslach Burnout Inventory* (MBI) (13), the *General Health Questionnaire* (GHQ) (12 studies), the *Mean Absenteeism Figures* (10 studies) and the *State-Trait Anxiety Inventory* (STAI) (5 studies). Except for the first instrument, the remaining three scales have a satisfactory validity and high reliability, with the Cronbach's α 0.76–0.90 for the MBI, 0.82–0.86 for GHQ and 0.86 for STAI. Many scales and inventories were used for a particular study's purposes, and their psychometric characteristics were not reported.

Global quality assessment of intervention studies

Methodological quality of studies included in the review was evaluated on a 3-point rating scale (from 0 to 2) using two criteria, namely, whether the study controlled for the interaction between:

(1) intervention (program implementation) and time;
(2) intervention and independent variables other than time, e.g. demographic variables, research settings characteristics, etc. (covariates).

Ad (1). High quality—the highest score (two points) was allotted to publications in which the intervention × time interaction was directly controlled for in the study design, i.e. the experimental and control groups were compared not in terms of raw scores, but differences between their PRE and POST scores; or multivariate analyses of variance (ANOVA/MANOVA) were used where the time variable was introduced into the model as a qualitative factor; or multivariate analyses of covariance (ANCOVA/MANCOVA) were performed, where the baseline PRE scores were assumed as covariant variables of the POST scores.

Moderate quality (1 point)—was assigned to studies in which the intervention × time interaction effect was not measured directly, i.e.

differences between the experimental and control groups' PRE and POST scores were assessed using simple unidimensional tests (e.g. Student's *t*-test for independent samples, univariate ANOVA etc.).

Low quality rating (0 points)—if the intervention × time interaction effect was not controlled, i.e. not even simple tests were performed to account for the time factor.

Ad (2). The same scoring procedure using a 3-point rating scale (from 0 to 2) was applied to assess the degree of accounting for the interaction effect between the intervention (program implementation) and covariates other than time.

Summarizing, the aggregate rating scale for both criteria ranged from four points (high quality, i.e. the highest score on both criteria), through three (moderate quality), two (low quality) to one point (very low quality, with score 0 for the covariate criterion; Table 4).

A total of 18 high quality intervention studies were identified. E.g. Galinksy *et al.* (2000) found that supplementary rest breaks when compared with a conventional breaks schedule improved data-entry operators' comfort of work, also in terms of mood states. In the study by Iwi *et al.* (1998) counseling sessions provided to employees facing organizational change had no significant effect on their GHQ symptomatology and occupational stress indicator, but were rated as most helpful Maes *et al.* (1998) in their 'Healthier Work in Brabantia' project combined interventions aiming at healthier lifestyles and changes in working conditions—the program brought stable enhancement of employees' health, some aspects of wellness and a reduction in absenteeism Van Weert *et al.* (2005) implemented a new care model (snoezelen, or multisensory stimulation, MSS), for nursing home residents with dementia. The program improved the quality of working life

for dementia caregivers (nurses) reducing their emotional exhaustion and job stress and increasing overall job satisfaction. Zołnierczyk-Zreda (Zołnierczyk-Zreda, 2002) in her worksite stress management intervention attained a significant improvement of white-collar bank workers' coping styles: and increment in problem-oriented coping and seeking social contacts, but a reduction in negative emotion-oriented coping only in those with high negative affectivity levels.

High and moderate quality studies were taken into account in the assessment of intervention efficacy. The efficacy ratio was calculated as the proportion of significantly improved dependent variables to the total number of variables measured in a particular study.

As can be seen in Table 5, the highest efficacy ratios (over 0.70) were attained in studies aiming to reduce stress and absenteeism levels, while intervention efficacy was definitely lower regarding job satisfaction improvement and mental health enhancement (both ratios below 0.50). Stress reduction (coping improvement) interventions seem to be better known, more evident, and easier to implement than those aimed at increasing employees' job satisfaction.

Examples of effective interventions

The original aim of the review was to determine the most effective approach. However, due to the heterogeneity of the studies as well as their methodological limitations, the results of our analyses are inconclusive. In consequence, only exemplification of promising studies in particular categories is presented.

Among the high quality studies one study reporting significant intervention effects, and showing the highest proportion of significantly improved dependent variables to the total number of variables measured was identified in

Table 4: Distribution (number and percentage) of intervention studies by their quality rating and aims/outcome type

Intervention study aims/outcome type	Quality category			
	High *n* (%)	Moderate *n* (%)	Low & very low *n* (%)	Missing data *n* (%)
Stress reduction/better coping (*n* = 29)	2 (7)	7 (24)	16 (55)	4 (14)
Mental health enhancement (*n* = 13)	7 (54)	1 (8)	5 (38)	—
Job satisfaction improvement (*n* = 14)	3 (21)	5 (36)	6 (43)	—
Job effectiveness improvement (*n* = 18)	4 (22)	9 (50)	5 (38)	—
Absenteeism reduction (*n* = 5)	2 (40)	2 (40)	—	1 (20)

Table 5: Ratio of variables indicating significant post-intervention positive improvement to all dependent variables in high and moderate quality studies by outcome type (intervention study aims)

High quality intervention studies ($n = 18$) by their aims/outcome type	Dependent variables under study (n)	Dependent variables showing significant effect of intervention (n)	Ratio of the significantly improved to all dependent variables
Stress reduction/better coping ($n = 2$)	11	8	0.73
Mental health enhancement ($n = 7$)	43	17	0.40
Job satisfaction improvement ($n = 3$)	35	6	0.17
Job effectiveness improvement ($n = 4$)	51	30	0.58
Absenteeism reduction ($n = 2$)	11	8	0.73

each of the five groups of aims. As a result, five most effective interventions were indicated (within each of the five groups). Their content, measures used and findings are briefly described below.

Stress reduction

In the study by Nielsen *et al.* (2006) concerning participatory approach the intervention aim was to change the attitudes of the participants (canteen staff in hospitals or care homes for the elderly) so as to make them confident about undertaking health-promoting initiatives and taking responsibility for competencies shared both by the individual and worksite. To identify specific issues, a thorough assessment of mental health risks was conducted. Subsequently, working groups were established to develop initiatives based on the risk assessment results. While the main aims of the initiatives were the same in both groups, their translation into interventions differed.

Two experimental groups and two control groups participated in the study. The following outcome variables were analyzed: stress symptoms, social support, job satisfaction, opportunities for personal development and vitality. The intervention was successful in one of the experimental groups, where all the variables but one (social support) improved significantly, while in the other group significant improvement was attained only in stress and vitality symptoms. However, organizational structure of the latter workplace turned out not to allow for more changes, and besides, major conflicts among employees at the time of the study might have affected the participants'

commitment and in consequence—the intervention outcome.

Implementation of this intervention suggests that the workplace organizational structure may significantly facilitate or hinder proposed modifications (a ceiling effect is possible; at a certain level organizations may benefit less from interventions). Moreover, the study design should account for contextual factors, e.g. a directive consultancy style that proved appropriate for these participants, might be unacceptable for employees more experienced in organizational development.

Mental health improvement

In the *Worksite health promotion program* implemented by Peters and Carlson (1999), the participants (primarily minority blue-collar employees) received a multimodal intervention: stress management training, educational workshops and counseling and self-directed behavior change. Stress management techniques included relaxation and meditation. Group intervention sessions had the following format: (i) discussion of previous goals; review of behavioral contracts; group feedback/reinforcement; (ii) relaxation exercises; (iii) a review of educational presentations; (iv) discussion and questions; (v) revised goal setting and behavioral contracting.

The process of self-directed behavior change consisted of educating and training individuals in self-modification techniques. The sessions focused on self-regulation techniques such as selecting target behaviors for change, making a plan for change (contracting), observing and monitoring behavior, evaluating and modifying plans and maintaining positive behavior changes. Such techniques as encouraging self-

disclosure, providing positive feedback and enhancing self-efficacy beliefs were also utilized.

A number of measures were analyzed, but positive intervention effects were found in about a half of the variables, including health risk, health self-efficacy, curiosity, depression, lack of social support, positive environment, intention to make changes, access to health care and health behavior. Further favorable outcomes were that most employees at the worksite were interested in the program participation; it was very favorably evaluated at the project completion and would be recommended to other workers. This suggests that the authors' sensitivity to and efforts to account for these workers' ethnic and socioeconomic status in the program were effective.

Increased job satisfaction

The *Social Motivational Training* (SMT) by (Dupuis and Struthers, 2007) is rooted in social cognitive theoretical frameworks. Its first component is concerned with increasing participants' awareness of people's tendency to make spontaneous attributions: an example of the spontaneous attribution phenomenon is provided, and the participants (working senior undergraduate university students) are asked to think about and elaborate on a situation in which they had behaved similarly. The second component is meta-cognition: participants are instructed to think about how one makes attributions and about the influence of these attributions on one's judgments, affect and behaviors. In the third SMT component, the participants are asked to apply mental simulation: they were to imagine themselves in a scenario where a coworker commits a transgression, generate possible causes of the transgression and then consider their effect.

Cognitive, affective and behavioral responses to an imaginary character were measured. The intervention impact was positive for all outcome variables: expectation, responsibility, intentionality, anger, sympathy, readiness to cooperate, recommend to coworkers, warn others and report to a supervisor. The most important finding of this study was the change in the participants' social motivation, i.e. an increase in their prosocial and decrease in antisocial evaluations of and interaction with the perceived transgressor. The cognition, affect and behavior changes show that the intervention was pervasive and successful in bringing the participants closer to a prosocial co-worker profile.

Job effectiveness improvement

In the program of employee problem-solving teams (ACTion Team) implemented by Park *et al.* (2004) an assumption was made that to improve employees' health and well-being as well as their job effectiveness a mutual relationship should be created between the store employees (majority and minority groups) and the management The teams were to develop, implement and evaluate a tailored action plan addressing the identified worksite problems. The ACTion team plans were developed using a five-step problem-solving process: familiarization, skill building, prioritization, action and reaction.

In the reaction phase, the ACTion team reviewed the plan, monitored progress and communicated with each other and the rest of the store's employees concerning what steps were being taken to refine and adjust the overall action plan. The teams also focused on improvements related to coworker support and recognition.

The following measures were analyzed: organizational climate, co-worker and organizational support, communication, safety and health climate, well-being, job stress and health status. Except for safety and health climate all the organizational climate and well-being variables were positively affected by the intervention. The intervention effects were greater for the ethnic minority than for the majority groups. The findings suggest that interventions fostering communication, shared goals and active problem-solving can be useful in attaining workforce diverse goals.

The results also suggest that organizational climate may play a mediating role in producing these effects. It is worth noting that the positive intervention effects were not limited to employees who had directly participated in the process.

Absenteeism reduction

The Stress Management Training implemented by Murphy and Sorenson (1988) in a municipal highway maintenance department included two types of methods.

Biofeedback: Forehead muscle activity and hand temperature were recorded at the start and end

of each session using a microprocessor-based recording system. Subjective reports of mental health, somatic complaints, sleep disturbances, alcohol and cigarette use and tension levels were also obtained. Workers in the biofeedback group received continuous audio feedback of forehead electromyographic activity.

Muscle relaxation: Workers in the muscle relaxation group listened to a series of cassette tapes containing muscle tension and relaxation exercises.

Three months after the last training session, each worker returned to the training room for one session. They were instructed to become as relaxed as possible, using skills they had learned previously. Psychophysiological and subjective measures (mental health, somatic complaints, sleep disturbances, alcohol and cigarette use and tension levels) were taken during training. Data on absenteeism were also collected.

Workers who received muscle relaxation (but not biofeedback) training had significantly lower absenteeism and higher attendance ratings in the year immediately following training relative to non-volunteers. Beyond the first post-training year, these differences were not evident.

As a primary strategy to reduce employee stress at work, stress management has significant limitations since no attempt is made to alter the sources of work stress.

Summarizing, findings of the five most effective intervention studies seem interesting. It should be noted that regardless of the intervention level (individual or organizational) the role of the organization and its structure in facilitating changes was emphasized by four out of the five authors. Murphy and Sorenson (1988) even conclude that stress management may be only an adjunct to organizational changes as it is crucial to remove the source of stress in the first place. An organizational change was the intervention goal in only one of these successful studies, and a positive outcome was achieved in only one of the two study groups. This illustrates how difficult it is to successfully influence working conditions.

CONCLUDING REMARKS

Although the five groups of intervention aims identified in this review (stress reduction/better coping; mental health improvement, increased job satisfaction, job effectiveness improvement and absenteeism reduction) differ considerably from each other, the same intervention approach could be used to attain various goals: e.g. skills training was the most common intervention category used for stress reduction, increasing job satisfaction and improving mental health. In turn, many different intervention approaches were implemented to achieve the same goal (e.g. stress reduction was the aim of 22 various interventions).

Only few programs were implemented and evaluated in two or more studies, including the *Stress Inoculation Training* developed by Meichenbaum (1985) and used by Cecil and Forman (1990), *Dual Cognitive Self-Instructional Procedure* (Payne and Manning, 1990), *Resource Intervention* and *Single Resource Intervention* (Freedy and Hobfoll, 1994), *The Basic Stress Management Course* (Roger and Hudson, 1995), *Short-term Participatory Intervention* (Mikkelsen *et al.*, 2000; Mikkelsen and Gundersen, 2003) and *Psychological Training Program* (Razavi *et al.*, 1988, 1991, 1993). Less than a half of the reviewed interventions were theory-driven.

In 79 studies included in the DataPrev review, 99 different outcome variables were investigated using 169 measures, while only 19 were used in more than one study. Among the most popular were the *Mean Absenteeism Figures*, the *Maslach Burnout Inventory*, the GHQ and the STAI. A majority of the variables were measured with many different methods, i.e. rating scales, life data and physiologic measures—mostly without psychometric standardization.

Methodological limitations of the studies are another source of difficulty in comparing interventions. The number of participants varied significantly across studies, ranging from as few as 20 to 2207 participants. In approximately 20% of the reviewed studies, the samples were small (<50 participants). In cases where the reported differences only approached the significance level, this lack of statistical significance might be due to a small sample size. Similarly, the duration of particular interventions was diverse, with workshops taking less than a day and multicomponent trainings scheduled from 3 to over 12 months. In almost a half of the studies (32) either the follow-up period was very short (<12 weeks) or only a directly post-intervention

assessment was made, while an at least 3-month follow-up period is recommended.

In high or moderate quality studies interventions had a positive effect on about a half of the outcome variables regarding better coping with stress, increased job satisfaction and burnout reduction, with the best results achieved in absenteeism reduction, while the least positive effect was obtained on co-worker and/or supervisor support measured in 16 studies, but found to be enhanced only in 4.

The most promising program seems to be the *Stress Inoculation Training* (Cecil and Forman, 1990) based on Meichenbaum's model and adapted to stress management training with teachers. The following major topics were covered in each session: discussion of definitions and sources of stress, relaxation, introduction to rational restructuring based on the Ellis model of emotions, application of coping skills and development of additional stress scripts.

Contextual factors seem important for the intervention success. Target group characteristics (e.g. socio-economic status or a minority group membership) should be carefully analyzed and intervention activities tailored to the participants' needs and possibilities.

Regardless of the intervention level (individual or organizational) the role of the organization and its structure as a primary source of stress was emphasized by most authors. However, it turned out to be difficult to influence working conditions: organizational changes were seldom the intervention goal, and a positive outcome was seldom reported. An impressive exception was the Brabantia Project (Maes *et al.* 1998), a 3-year wellness-health intervention targeted to blue-collar workers, which included lifestyle counseling sessions and work analyses as well as considerable organizational changes implemented with the workers' participation. A significant stable enhancement of the workers' autonomy and control feelings was accompanied by a significant reduction in absenteeism (which seems to be a valid indirect measure of good mental health). However, no significant post-intervention change was found using the SCL-90 scale screening for psychopathological symptoms. The study suggests that the traditional instruments assessing ill mental health (such as SCL-90 or GHQ) may not be sensitive enough to measure workplace mental health improvement and that perhaps other dimensions should be developed and evaluated.

This may partially explain why our review of mental health promotion programs provided no conclusive evidence of their effectiveness. There is a need for the development of indicators and appropriate measures of positive mental health. To identify effective interventions, besides better methodological standards, new programs and new evaluation dimensions should be developed and implemented.

SUPPLEMENTARY MATERIAL

Supplementary material is available online at Neuro-Oncology (http://neuro-oncology.oxford journals.org/).

FUNDING

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