

Workplace interventions that are
effective for promoting mental
wellbeing

Synopsis of the evidence of
effectiveness and cost-
effectiveness

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Part I - A Review of Interventions that Promote Mental Wellbeing in the Workplace

Objectives

This review aims to identify and determine which interventions based in the workplace are effective in improving mental wellbeing and are applicable to England.

Methods

The review followed protocols set out by NICE¹. It considered studies that assessed the effectiveness of workplace interventions aimed at either promoting or improving mental wellbeing. Nineteen databases and twenty-four websites were searched for relevant research including systematic reviews, reviews and original research papers that were published since 1990. On receipt of the abstracts, the titles were filtered and those that were irrelevant were discarded. Abstracts were then screened and papers were obtained for those that fitted the inclusion criteria. Those studies included in the review went on to a data extraction process and quality assessment. Each study was given a rating of ++ (high) + or – (low) according to the definitions given within the protocol. The studies were grouped as being organisational interventions or stress management interventions and then categorised by intervention type. For organisational interventions the categories were: changing working/organisational practices; training supervisors and managers and altering shift or work practices. For stress management interventions the categories were: training to cope with stress; counselling and therapy; exercise and relaxation and health promotion interventions. Within each of these categories evidence was provided using a narrative synthesis, supported by evidence tables, drawing out the key features of each study.

¹ Contained within NICE. 2006. Public Health Guidance: Development Process and Methods March 2006. London

Review of Effectiveness

The review of the effectiveness of workplace interventions to improve mental wellbeing included 66 primary studies. A broad range of interventions were identified and were evaluated based on either organisational interventions or stress management interventions.

Evidence of Effectiveness for Organisational Level Interventions

Changing working/organisational practices

All the interventions (except one) that were designed to improve mental wellbeing through changing organisational practices adopted a participatory approach; the studies were mainly quasi-experimental and varied in quality. Four studies were graded positively, these were Dahl-Jorgensen *et al.* (2005) (2/+), Landsbergis and Vivona-Vaughan (1995) (2/+), Maes *et al.* (1998) (2/+) and Mikkelsen & Saksvik (1999) (2+). Of these only one, Dahl-Jorgensen *et al.* (2005), had an intervention that was shown to work.

Five of the eleven studies showed that the participatory interventions had a positive effect (as measured by validated questionnaire). However only one study, (Dahl-Jorgensen *et al.*, 2005) was rated as +. From the five studies that did identify an effect, the quality rating of the study impacts on the level of evidence available at this time. Thus it is currently unclear whether the organisational participatory approach to change is an effective means of improving mental wellbeing in the workplace.

Evidence Statement 1

Ten studies, none of which were randomised control trials, evaluated the effectiveness of interventions involving a participatory approach to organisational change on mental wellbeing. The studies varied in quality and there was heterogeneity of interventions, populations and outcomes evaluated. Four of the ten studies were given a positive quality grading and one of these Dahl-Jorgensen et al (2005 +) demonstrated that the

intervention improved mental wellbeing. There is currently insufficient evidence of quality to judge the effectiveness of the use of organisational participatory interventions in the workplace to improve mental wellbeing and further research is required.

1. Bourbonnais *et al.* 2006 Quasi-experimental –
2. Dahl-Jorgensen *et al.* 2005 Quasi-experimental (non RCT)
3. Kawakami, 1997 Quasi-experimental –
4. Landsbergis & Vivona-Vaughab, 1995 Quasi-experimental +
5. Maes *et al.* 1998 Quasi-experimental +
6. Mikkelsen & Saksvik, 1999 Non-RCT +
7. Mikkelsen *et al.*, 2000 Non-RCT +
8. Mattila *et al.* 2006 Quasi-experimental -
9. Munz *et al.* 2001 Quasi-experimental -
- 10 Reynolds, 1997 Quasi-experimental -

Training Supervisors and Managers

The results of a small number of high quality Randomised Control Trials, indicate that neither web-based training nor more traditional lecture based training (3 hours in total) for supervisors improves mental wellbeing in subordinate workers. One lower quality study which evaluated the impact of training supervisors on subordinate workers identified that physiological markers for stress were significantly reduced in the subordinate worker group. The training given in this study was approximately 40 hours over a 6 month period. This suggests that further research is required evaluating the type of supervisory training required to impact on mental wellbeing in subordinate workers.

In addition to this study, one further study examined the impact on the physiological strain of project managers if they themselves were given additional training. This study aimed to increase management control using a

10 hour training session, however there was no impact on wellbeing outcomes post training.

Evidence Statement 2

Four studies evaluated the impact of training for managers and supervisors on the mental wellbeing of subordinate staff. Two randomised control trials (Kawakami et al. 2006 ++) and (Kawakami et al. 2005 ++) undertaken in Japan found that web based training to improve management skills was not effective in improving the wellbeing of subordinate workers. A randomised control trial in a Japanese brewery (Takao et al. 2006 ++) and a non randomised control trial in a Swedish insurance company (Theorell, 2001 ++) used traditional face-to-face training. The Japanese trial found no significant difference in the whole group analysis. The Swedish study found that physiological markers for stress were significantly reduced in the subordinate workers in the intervention group. The training given in this study was approximately 40 hours over a 6 month period. There is therefore insufficient evidence to allow any positive statement to be made and further research is required evaluating the impact of different types of supervisory training on the mental wellbeing in subordinate workers.

Altering Shift or Work Practices

The three studies within this category were not rated highly for quality. Two were rated + (Etzion 2003+) and (Totterdell and Smith, 1992+) and one minus (Bussing and Glaser 1999-). The research does identify that taking a vacation or changing the shift system has an impact on mental wellbeing and burnout. However, both studies had small sample sizes and are not currently replicated by other research. With regard to taking a vacation, the follow-up period was 3 weeks and no further information is available to assess the longer term impact (Etzion 2003). Changing the shift system was found to

significantly decrease GHQ-12 scores (Totterdell and Smith, 1992). The results indicate a positive response to changing from a 7-day consecutive shift system to the 35-day Ottawa system. Although the study is rated as a + rather than ++, this finding is important in relation to more recent research evaluating the adverse health effects of shift work and potential links to cancer.

Evidence Statement 3

There is evidence from one non randomised trial of white collar workers working for an industrial employer in Israel (Etzion, 2003 +) that taking a vacation impacts positively on burnout in the short term (immediately on return from holiday and at three weeks) but stress can significantly fall on return to work ($p < 0.01$) but at three weeks returns to pre-vacation levels as measured by a questionnaire.

There is evidence from a UK quasi-experimental study of police officers (Totterdell, 1992 +) that changing the shift system from 7 day consecutive shifts to the 35 day Ottawa system can positively impact on mental wellbeing as measured by a questionnaire.

Support or training to improve skills or job role

Two high quality studies examined the impact of Psychosocial Intervention training (PSI) on burnout in mental health care workers. Both studies were randomised control trials (Doyle, 2007 ++) and (Ewers *et al.* 2002 ++) although differences were found in the results. Personal accomplishment was found to improve in both groups while exhaustion and depersonalisation were found to improve in only one study (Ewers *et al.* 2002). Although these were both small scale studies, the results indicate that PSI does have a positive impact on burnout. However both studies evaluated the impact of the intervention immediately post training with no longer-term evaluation.

One study, (Shimizu *et al.* 2003 +) showed that providing training to enhance communication skills could slightly improve personal accomplishment. However this was measured using a subscale of the Maslach Burnout Inventory (MBI), and this scale is less obviously related to well-being which, coupled with experimental shortcomings in the study (particularly concerning allocation of subjects) means that care should be taken in the interpretation of this finding.

The remaining four studies reviewed within the section did not have a positive impact on mental wellbeing as a result of the interventions carried out.

Evidence Statement 4

Two small randomised control trials with UK mental health workers (Doyle, 2007 ++) and **(Ewers 2002 ++)** used a questionnaire at the end of the intervention to evaluate Psychosocial Intervention courses. Doyle's study evaluated 3 hour sessions weekly for 16 weeks during working time and found no significant differences between the groups apart from personal accomplishment ($p < 0.05$). Ewers' study evaluated 20 days training and found significant improvements in the intervention group for personal accomplishment ($p = 0.01$), exhaustion ($p = 0.04$) and depersonalisation ($p = 0.01$). These small studies indicate that Psychosocial Intervention courses can have a positive impact on burnout in the short term. The longer term impact is unknown.

Stress Management Interventions

Training to cope with stress

Interventions aimed at improving people's ability to cope with issues affecting their mental wellbeing varied in both their focus and the criteria through which effectiveness was evaluated. These differences make it difficult to determine any coherent pattern to the results. It is evident from current research that a number of approaches do have a positive impact on mental wellbeing including Affect School, Cognitive Training, group sessions, face-to-face feedback, and paper-based approaches, rather than web-based training or mailshots followed up by telephone calls.

There is insufficient consistency across the research reviewed to identify what specific guidance can be made, especially as most programmes are multifactorial and the individual elements have not been separately examined. It does appear that longer term interventions have more of an impact, (that is, several hours training rather than a single hour-long lecture). Interaction with others, either facilitators or colleagues, also appears to improve the likelihood of success as does the use of follow-up by telephone within an intervention. In terms of specific content, most seem to provide a structure of explaining the nature and causes of stress in general terms before examining a mixture of coping mechanisms. Again these appear to be a mixture but would seem to generally incorporate a combination of approaches to help the individual 'live with' the stress (e.g. coping or relaxation) coupled with encouraging at least local measures to reduce stress at source. To this end, some courses concentrate on measures which the individual can control and others include a degree of organisational intervention. However, evidence statements regarding this are made with caution because, as stated above, these individual elements have not been formally evaluated for their efficacy.

Evidence Statement 5

Eight studies that were graded positively evaluated different types of stress-management training¹⁻⁸ six studies found a positive impact on

mental wellbeing as measured by questionnaire. One Australian randomised trial found a positive effect that was close to but not statistically significant (Lindquist et al, 1999 ++) and one study with 54 volunteer German bus drivers (Aust et al 1997) found no significant effects. The differences amongst studies in interventions, populations and study quality mitigate against definitive conclusions. However there is reasonable evidence that multi-faceted training, covering stress awareness, coping and stress reduction is an effective format.

Six of the eight studies had training programmes involving a trainer or facilitator of which four found a positive impact on mental wellbeing, again measured by questionnaire. Two small randomised control trials (Horan et al. 2002 +) and (Rahe et al. 2002 +) found that small group sessions have a positive impact on mental wellbeing.

There is evidence from one randomised trial undertaken in the USA (Cook 2007++) that compared web materials with paper based materials that paper based training materials are more effective for improving mental wellbeing.

1 (Bergdahl et al., 2005) RCT +

2. (Gardner, 2005) Non-RCT +

3. (Jones et al., 2000) RCT ++

4. (Horan et al., 2002) RCT +

5. (McCraty et al RCT) RCT++

6. (Rahe et al., 2002) RCT +

7. (Aust et al., 1997) Non-RCT +

8. (Lindquist et al, 1999) RCT ++

9. Cook *et al.* 2007 RCT ++

Counselling and therapy

Three papers were identified which examined the effectiveness of various forms of counselling or therapy. Two of these (Bond and Bunce 2000+) and (Grime et al. 2004 +) were rated positively and identified positive benefits from the intervention. The third (Reynolds 1997-) was rated negatively and failed to demonstrate any effect. The research reviewed identified that Acceptance and Commitment Therapy, an Innovation Promotion Programme about changing sources of stress and a computerised Cognitive Behavioural Therapy programme had an effect on anxiety and depressive symptoms in the short term.

Evidence Statement 6

A UK randomised control trial (Bond and Bunce 2000 +) with 90 volunteers from a media company found that three half-day sessions of therapy and counselling delivered during work time had a positive impact on mental wellbeing in the short term as measured by questionnaire. A UK randomised trial with 24 cases and 24 controls who were NHS and Local Authority workers with 10 or more days absence due to stress, anxiety or depression in the previous 6 months (Grime et al. 2004 +) found that eight weekly sessions using a computerised Cognitive Behavioural Therapy programme had a positive impact on mental wellbeing in the short term as measured by questionnaire.

Exercise and relaxation interventions

The evaluation of interventions using exercise was based on 4 RCTs ranging in quality from + to ++. Three of the interventions involved aerobic sessions over periods between 8 and 24 weeks. The results in two of the studies indicate that aerobic exercise has a positive effect on mental wellbeing. Another study compared a cognitive stress reduction programme to a physical stress reduction programme but did not have a no intervention control group which made interpretation of the results unclear (Van Rhenen *et al.* 2005+)

The intervention in the fourth study took the form of a shorter duration office based exercise intervention for those working with VDUs and found this not to be effective (Hinman *et al.* 1997++).

The relaxation training interventions reviewed included a RCT (de Lucio *et al.* 2000+), and two non-RCT (Taniguchi *et al.* 2007+) and (Webb *et al.* 2000-). The studies were inconclusive in that two did not find an impact on mental wellbeing whereas one, rated as -, found an improvement in outcome measures. There is therefore insufficient research available at the moment to state whether relaxation training has a positive or negative impact on mental wellbeing.

Two studies evaluated the impact of massage therapy, a RCT (Field *et al.* 1997++) and a Non-RCT (Shulman and Jones,1996++). The studies contradicted each other with the RCT finding no effect and the Non-RCT finding an impact on the STAI. There were a number of issues with regard to the Field study which made it difficult to determine which, if any, of the multiple interventions had an impact. This is counter-balanced by the Shulman and Jones study which evaluated the intervention immediately post massage thus there is no clarity with regard to the longer term impact of the massage. There is currently insufficient data available to support or refute the usefulness of massage therapy in promoting mental wellbeing.

One RCT (Sheppard *et al.* 1997+), evaluated the impact of transcendental meditation versus a more conventional stress management programme. This + rated study found that STAI and IPAT depression scale scores were reduced within the transcendental meditation at 3 months and at the 3 month follow-up period.

Evidence Statement 7

A randomised trial comparing aerobic and nonaerobic exercise (Altchiler and Motta, 1994+) found that aerobic exercise had a positive

impact on anxiety and other questionnaire-based stress measures. A randomised control trial with Australian casino workers evaluated a 24 week out of work time programme which combined aerobic exercise (moderate to high intensity) for 20 minutes on three days per week; weight-training (light to moderate intensity) at least twice a week exercise; and behaviour modification interventions (health education seminars and health counselling) found mental health and other health benefits when measured at the end of the programme.

There is currently insufficient research available to support the use of relaxation training to improve mental wellbeing – further research required.

There is currently insufficient evidence to support the use of massage therapy in promoting mental wellbeing – further research required.

One US randomised trial comparing transcendental meditation with a more conventional stress management programme (Sheppard et al. 1997 +) found a positive impact on mental wellbeing in the longer term – further research required.

1 Altchiler and Motta, 1994 RCT +

2 Atlantis *et al.* 2004 RCT +

3. de Lucio *et al.* 2000 RCT +

4. Taniguchi *et al.* 2007 Non-RCT ++

5. Webb *et al.* 2000 Non-RCT -

6. Field, 1997 RCT ++

7. Shulman & Jones, 1996 Non-RCT ++

8. McElligott *et al.* 2003 RCT+

9. Sheppard *et al.* 1997 RCT +

Health promotion interventions

Three studies which took a broader health promotion approach to intervention were reviewed. All demonstrated positive outcomes. Two were randomised control trials (Hasson *et al.* 2005++) and (Peters and Carlson 1999+), the other was a before and after type study (Nielsen *et al.* 2006-).

The interventions involving health promotion studies identified that using health promotion methods which included aspects of improving mental wellbeing, can improve mental wellbeing in the individuals being assessed. However, one of the difficulties with the use of broader health promotion approaches is singling out which part of a multiple intervention is having the impact.

Evidence Statement 8

A randomised control trial undertaken in Sweden (Hasson et al. 2005 ++) with 129 cases and 174 controls drawn from volunteers working for a IT and media company found that a web based health promotion and lifestyle training package can improve mental wellbeing as measured using a non-standard questionnaire at baseline and at 6 months after the web site and related components being available.

Discussion

This review has covered a very broad area of research relating to mental wellbeing at work. The general lack of consistency in definition and use of terms to describe the healthy individual's emotional experience at work is widely recognised especially when in contrast to the clinically defined mental disorders or psychological ill-health. This has been reflected in the very broad range of survey terms needed to ensure comprehensive coverage and, within individual studies, in the plethora of outcome measures utilised. A similar comment can also be applied to the interventions themselves with 'individual interventions' ranging from sending out leaflets on stress, through recreational

music making to massage therapy. There are clear difficulties in finding consistent messages in such a body of evidence.

A number of the individual intervention studies were hampered by relatively poor adherence to intervention regimes, even where formal attrition from the study in terms of failure to complete all the evaluation measures was relatively low. In most studies, this deficiency was not formally addressed and so the implications from this for study outcome can only be surmised. It might be assumed that better adherence would have resulted in more positive outcomes but this cannot be stated with certainty.

With the organisational interventions a similar problem applies. Many of the authors comment adversely on the quality of implementation of interventions with lack of management commitment frequently referred to as a specific problem. In most cases, the researchers were not directly engaged in directing the intervention itself (quite correctly as it would have impaired their ability to carry out an impartial evaluation) and the studies took the form of a 'discovered experiment', rather than the individual interventions where the researchers have had greater control over the intervention.

Conclusions

There are many published papers relating to the general area of interventions intended to improve mental wellbeing in the workplace. These cover a wealth of different interventions and outcomes, reflecting a general imprecision in the descriptive terms used. Despite numerous methodological difficulties and shortcomings, enough of these papers are of adequate quality to suggest that there might well be tangible benefits from such interventions, although generally speaking the papers are not of sufficient quality or number to be able to make unequivocal evidence statements. It is hoped that it will be possible to build on the research base identified to provide clearer evidence in the future.

References Included in the Review

Alford WK, Malouff JM, Osland KS. (2005). Written Emotional Expression as a Coping Method in Child Protective Services Officers. *International Journal of Stress Management*; 12: 177-187.

Althiler LM. and Motta R. (1994). Effects of aerobic and nonaerobic exercise on anxiety, absenteeism, and job satisfaction. *Journal of Clinical Psychology*; 50: 829-40.

Atlantis E, Chow CM, Kirby A, Singh MF, Atlantis E, Chow CM, Kirby A, Singh MF. (2004). An effective exercise-based intervention for improving mental health and quality of life measures: a randomized controlled trial. *Preventive Medicine*; 39: 424-434.

Aust B, Peter R, Siegrist J. (1997). Stress management in bus drivers: A pilot study based on the model of effort-reward imbalance. *International Journal of Stress Management*; 4: 297-305.

Bergdahl J, Larsson A, Nilsson LG, Ahlstrom KR, Nyberg L. (2005). Treatment of chronic stress in employees: Subjective, cognitive and neural correlates. *Scandinavian Journal of Psychology*; 46: 395-402.

Bond FW, Bunce D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*; 5: 156-163.

Bourbonnais R, Brisson C, Vinet A, Vezina M, Abdous B, Gaudet M. (2006). Effectiveness of a participative intervention on psychosocial work factors to prevent mental health problems in a hospital setting. *Occupational & Environmental Medicine*; 63: 335-342.

Bunce D, West MA. (1996). Stress management and innovation interventions at work 132. *Human Relations*; 49: 209-232.

Bussing A, Glaser J. (1999). Work stressors in nursing in the course of redesign: Implications for burnout and interactional stress. *European Journal of Work and Organizational Psychology*; 401-426.

Butterworth S, Linden A, McClay W, Leo MC, Butterworth S, Linden A, McClay W, Leo MC. (2006). Effect of motivational interviewing-based health coaching on employees' physical and mental health status. *Journal of Occupational Health Psychology*; 11: 358-365.

Cook RF, Billings DW, Hersch RK, Back AS, Hendrickson A, Cook RF, Billings DW, Hersch RK, Back AS, Hendrickson A. (2007). A field test of a web-based workplace health promotion program to improve dietary practices, reduce stress, and increase physical activity: randomized controlled trial. *Journal of Medical Internet Research*; 9: e17.

Craig A. (1996). The influence of a healthy lifestyle program in a work environment: A controlled long-term study 928. *Journal of Occupational Health and Safety - Australia and New Zealand*; 12: 193-206.

Dahl-Jorgensen C, Saksvik PO, hl-Jorgensen C, Saksvik PO. (2005). The impact of two organizational interventions on the health of service sector workers. *International Journal of Health Services*; 35: 529-549.

de Lucio LLG, Gracia Lopez FJ, Marin Lopez MT, Mas HB, Caamano V,M.D. (2000). Training programme in techniques of self-control and communication skills to improve nurses' relationships with relatives of seriously ill patients: a randomized controlled study. *Journal of Advanced Nursing*; 32: 425-431.

Doyle M, Kelly D, Clarke S, Braynion P. (2007). Burnout: the impact of psychosocial interventions training. *Mental Health Practice*; 10: 16-19.

Engstrom M, Ljunggren B, Lindqvist R, Carlsson M. (2005). Staff perceptions of job satisfaction and life situation before and 6 and 12 months after increased information technology support in dementia care. *Journal of Telemedicine and Telecare*; 11: 304-309.

Eriksen HR, Ihlebaek C, Mikkelsen A, Gronningsaeter H, Sandal GM, Ursin H. (2002). Improving subjective health at the worksite: a randomized controlled trial of stress management training, physical exercise and an integrated health programme. *Occupational Medicine (Oxford)*; 52: 383-391.

Etzion D. (2003). Annual vacation: Duration of relief from job stressors and burnout. *Anxiety, Stress & Coping: An International Journal*; 16: 213-226.

Ewers P, Bradshaw T, McGovern J, Ewers B, Ewers P, Bradshaw T, McGovern J, Ewers B. (2002). Does training in psychosocial interventions reduce burnout rates in forensic nurses? *Journal of Advanced Nursing*; 37: 470-476.

Field T. (1997). Job stress reduction therapies 984. *Alternative Therapies in Health and Medicine*; 3: 54-56.

Gardner BR. (2005). Cognitive therapy and behavioural coping in the management of work-related stress: An intervention study. *Work and Stress*; 19: 137-152.

Grime PR. (2004). Computerized cognitive behavioural therapy at work: a randomized controlled trial in employees with recent stress-related absenteeism. *Occupational Medicine (Oxford)*; 54: 353-359.

Hasson D, Anderberg UM, Theorell T, Arnetz BB, Hasson D, Anderberg UM, Theorell T, Arnetz BB. (2005). Psychophysiological effects of a web-based stress management system: a prospective, randomized controlled intervention study of IT and media workers [ISRCTN54254861]. *BMC Public Health*; 5: 78.

Hinman M, Ezzo L, Hunt D, Mays A. (1997). Computerized exercise program does not affect stress levels of asymptomatic VDT users. *Journal of Occupational Rehabilitation*; 7: 45-51.

Horan AP, (2002). An effective workplace stress management intervention: Chicken Soup for the Soul at Work Employee Groups. *Work*; 18: 3-13.

Jones MC, Johnston DW. (2000). Evaluating the impact of a worksite stress management programme for distressed student nurses: a randomised controlled trial. *Psychology and Health*; 15: 689-706.

Kawakami N. (1999). Effects of mailed advice on stress reduction among employees in Japan: a randomized controlled trial 717. *Industrial Health*; 37: 237-242.

Kawakami N. (1997). Effects of work-related stress reduction on depressive symptoms among Japanese blue-collar workers 880. *Scandinavian Journal of Work, Environment & Health*; 23: 54-59.

Kawakami N, Kobayashi Y, Takao S, Tsutsumi A, Kawakami N, Kobayashi Y, Takao S, Tsutsumi A. (2005). Effects of web-based supervisor training on supervisor support and psychological distress among workers: a randomized controlled trial. *Preventive Medicine*; 41: 471-478.

Kawakami N, Takao S, Kobayashi Y, Tsutsumi A, Kawakami N, Takao S, Kobayashi Y, Tsutsumi A. (2006). Effects of web-based supervisor training on job stressors and psychological distress among workers: a workplace-based randomized controlled trial. *Journal of Occupational Health*; 48: 28-34.

Landsbergis PA, Vivona-Vaughan E. (1995). Evaluation of an occupational stress intervention in a public agency 258. *Journal of Organizational Behavior*; 16: 29-48.

Lindquist TL, Cooper CL. Using lifestyle and coping to reduce job stress and improve health in 'at risk' office workers. *Stress Medicine*: 15; 143-152.

Logan MS, Ganster DC. (2004). An Experimental Evaluation of a Control Intervention to Alleviate Job-Related Stress 95. *Journal of Management*; 31: 90.

Lucini DR. (2007). Stress management at the worksite: Reversal of symptoms profile and cardiovascular dysregulation. *Hypertension*; 49: 291-297

Maes S, Verhoeven C, Kittel F, Scholten H. (1998). Effects of a Dutch work-site wellness-health program: The Brabantia project. *American Journal of Public Health*; 88: 1037-1041

Martin AJ, Sanders MR. (2003). Balancing work and family: A controlled evaluation of the Triple P-Positive Parenting Program as a work-site intervention. *Child and Adolescent Mental Health*; 8: 161-169.

Mattila P, Elo AL, Kuosma E, Kyla-Setala E. (2006). Effect of a participative work conference on psychosocial work environment and well-being. *European Journal of Work and Organizational Psychology*; 15: 459-476.

McCraty R, Atkinson M, Tomasino D, McCraty R, Atkinson M, Tomasino D. (2003). Impact of a workplace stress reduction program on blood pressure and emotional health in hypertensive employees. *Journal of Alternative & Complementary Medicine*; 9: 355-369.

McElligott D, Holz MB, Carollo L, Somerville S, Baggett M, Kuzniewski S, Shi Q. (2003). A pilot feasibility study of the effects of touch therapy on nurses. *Journal of the New York State Nurses Association*; 34: 16-24.

Mikkelsen A. & Saksvik PO. (1999). Impact of a participatory organizational intervention on job characteristics and job stress 729. *International Journal of Health Services : Planning, Administration, Evaluation*; 29: 871-893.

Mikkelsen AS, Saksvik PO, Landsbergis P. (2000). The impact of a participatory organizational intervention on job stress in community health care institutions. *Work and Stress*; 14: 156-170.

Mino Y, Babazono A, Tsuda T, Yasuda N, Mino Y, Babazono A, Tsuda T, Yasuda N. (2006). Can stress management at the workplace prevent depression? A randomized controlled trial. *Psychotherapy & Psychosomatics*; 75: 177-182.

Munz DC, Kohler JM, Greenberg CI. (2001). Effectiveness of a comprehensive worksite stress management program: Combining organizational and individual interventions. *International Journal of Stress Management*; 8: 49-62.

Nhiwatiwa FG. (2003). The effects of single session education in reducing symptoms of distress following patient assault in nurses working in medium secure settings. *Journal of Psychiatric and Mental Health Nursing*; 10: 561-568.

Nielsen K, Fredslund H, Christensen KB, Albertsen K. (2006) Success or failure? Interpreting and understanding the impact of interventions in four similar worksites. *Work and Stress* 20; 272-287.

Pelletier KRR. (1998). Managing job strain: A randomized controlled trial of an intervention conducted by mail and telephone. *American Journal of Health Promotion*; 12: 166-169

Peters KK, Carlson JG. (1999). Worksite stress management with high-risk maintenance workers: A controlled study. *International Journal of Stress Management*; 6: 21-44.

Rahe RH, Taylor CB, Tolles RL, Newhall LM, Veach TL, Bryson S, Rahe RH, Taylor CB, Tolles RL, Newhall LM, Veach TL, Bryson S. (2002). A novel

stress and coping workplace program reduces illness and healthcare utilization. *Psychosomatic Medicine*; 64: 278-286.

Reynolds S. (1997). Psychological well-being at work: is prevention better than cure? 886. *Journal of Psychosomatic Research*; 43: 93-102.

Schaubroeck J, Ganster DC, Sime WE, Ditman D. (1993). A field experiment testing supervisory role clarification 145. *Personnel Psychology*; 46: 1-25

Sheppard WDI, Staggers FJJ, John L. (1997). The effects of a stress-management program in a high security government agency. *Anxiety, Stress & Coping: An International Journal*; 10: 341-350.

Shimazu A, Kawakami N, Irimajiri H, Sakamoto M, Amano S, Shimazu A, Kawakami N, Irimajiri H, Sakamoto M, Amano S. (2005). Effects of web-based psychoeducation on self-efficacy, problem solving behavior, stress responses and job satisfaction among workers: a controlled clinical trial. *Journal of Occupational Health*; 47: 405-413.

Shimazu A, Okada Y, Sakamoto M, Miura M, Shimazu A, Okada Y, Sakamoto M, Miura M. (2003). Effects of stress management program for teachers in Japan: a pilot study. *Journal of Occupational Health*; 45: 202-208.

Shimazu A, Umanodan R, Schaufeli WB, Shimazu A, Umanodan R, Schaufeli WB. (2006). Effects of a brief worksite stress management program on coping skills, psychological distress and physical complaints: a controlled trial. *International Archives of Occupational & Environmental Health*; 80: 60-69.

Shimizu T, Mizoue T, Kubota S, Mishima N, Nagata S, Shimizu T, Mizoue T, Kubota S, Mishima N, Nagata S. (2003). Relationship between burnout and communication skill training among Japanese hospital nurses: a pilot study. *Journal of Occupational Health*; 45: 185-190.

Shulman KR, Jones GE. (1996). The effectiveness of massage therapy intervention on reducing anxiety in the workplace. *Journal of Applied Behavioral Science*; 32: 160-173.

Takao S, Tsutsumi A, Nishiuchi K, Mineyama S, Kawakami N, Takao S, Tsutsumi A, Nishiuchi K, Mineyama S, Kawakami N. (2006). Effects of the job stress education for supervisors on psychological distress and job performance among their immediate subordinates: a supervisor-based randomized controlled trial. *Journal of Occupational Health*; 48: 494-503.

Taniguchi T, Hirokawa K, Tsuchiya M, Kawakami N, Taniguchi T, Hirokawa K, Tsuchiya M, Kawakami N. (2007). The immediate effects of 10-minute relaxation training on salivary immunoglobulin A (s-IgA) and mood state for Japanese female medical co-workers. *Acta Medica Okayama*; 61: 139-145.

Theorell T. (2001). Employee effects of an educational program for managers at an insurance company 964. *Psychosomatic Medicine*; 63: 724-733.

Totterdell P, Smith L. (1992). Ten-hour days and eight-hour nights: Can the Ottawa shift system reduce the problems of shiftwork? *Work & Stress*; 6: 139-152.

van Rhenen RW. (2005). The effect of a cognitive and a physical stress-reducing programme on psychological complaints 721. *International Archives of Occupational and Environmental Health*; 78: 139-148.

von Vultee PJ, Arnetz B, von Vultee PJ, Arnetz B. (2004). The impact of management programs on physicians' work environment and health. A prospective, controlled study comparing different interventions. *Journal of Health Organization & Management*; 18: 25-37.

Wachi MK. (2007). Recreational music-making modulates natural killer cell activity, cytokines, and mood states in corporate employees. *Medical Science Monitor*; 13: 57-70.

Walach H, Nord E, Zier C, etz-Waschkowski B, Kersig S, Schupbach H. (2007). Mindfulness-based stress reduction as a method for personnel development: A pilot evaluation. *International Journal of Stress Management*; 14: 188-198.

Webb MS, Smith KA, Yarandi H. (2000). A progressive relaxation intervention at the worksite for African-American women 978. *Journal of National Black Nurses' Association : JNBNA*; 11: 1-6.

Wilson SA, Tinker RH, Becker LA, Logan CR. (2001). Stress management with law enforcement personnel: A controlled outcome study of EMDR versus a traditional stress management program. *International Journal of Stress Management*; 8: 179-200.

Part II: A review of cost-effectiveness literature on: public health interventions that promote mental wellbeing in the workplace

Method

A systematic search of three economic databases (NHS EED, HEED and Econlit) resulted in a total of 118 potentially relevant studies. The literature search was carried out by a team from Cardiff University. Following screening of studies identified for the concurrent effectiveness review, a further 22 studies were found that contained potentially relevant economic evidence.

Only economic evaluations (cost-effectiveness, cost-utility and cost-benefit analysis) of workplace-based interventions that promote mental wellbeing in working adults who experience stress, anxiety or depression at work were included. This includes studies of multi-faceted workplace health promotion programmes that contain a component to explicitly address the mental wellbeing of employees.

After reviewing the title and abstract of each identified study, full copies of 29 papers were requested for further evaluation. One study was unobtainable as insufficient information was provided with the original citation. An examination of the bibliographies in the 28 papers that were obtained identified a further 22 potentially relevant papers; copies of these papers were requested and obtained. Of the 50 full papers obtained, 48 were excluded after applying the ex/inclusion criteria, leaving two papers for full review. Both these studies were found by “hand searching” the bibliographies of obtained papers.

Results

A summary of the two reviewed studies is presented below:

Lead Author	Year	Type	Quality	Country	Intervention
Shi, L.	1993	Cost-benefit analysis	+	USA	Multi-component health promotion programme
Golaszewski, T.	1992	Cost-benefit analysis	+	USA	Multi-component health promotion programme

In each study, the programmes contained a component that explicitly addressed stress management at work. The economic analysis in each study was based on observational data, with health outcomes assessed using health-risk assessment surveys. Neither study used Quality Adjusted Life Years to measure the health outcomes.

Both reviewed studies provided evidence of the positive net economic benefits of multi-component workplace health promotion programmes. Conducted from the perspective of the employer, they also supported the business case for investing in such programmes. It was not possible, however, to isolate the precise contribution of the health promotion programmes, or exact part thereof, to reductions in outcomes directly associated with changing levels of stress, anxiety or depression in participating employees.

Due to differences between the studies relating to programme components, the methodologies used to determine the costs and outcomes, and the outcomes actually measured, it was not possible to rank the studied interventions by some indicator of their economic value.

There are a number of issues hindering the applicability of the study results to the UK, relating to the fact that they took place in the USA, and considered large, commercial companies.

Conclusions

There appears to be no research published since 1990 reporting the cost-effectiveness, cost-utility or cost-benefit of worksite interventions that directly promote mental wellbeing in the workplace.

There appears to be very limited research published since 1990 reporting the cost-effectiveness, cost-utility or cost-benefit of worksite wellness or health promotion programmes that contain a component that explicitly addresses the mental wellbeing of employees (typically, through an initiative(s) to manage work-related stress). Two cost-benefit analyses (quality assessment: +) were reviewed herein.

Given the scarcity of evidence relevant to the development of the guidance at hand, model-based analysis of interventions that directly promote the mental wellbeing of employees in UK companies and organisations, incorporating quality of life outcomes, is thus recommended. Such analysis should incorporate both gains in the quality and quantity of life, and investigate the economic value of interventions in a range of occupational settings.

References

Golaszewski, T. et al. A benefit-to-cost analysis of a worksite health promotion programme. *Journal of Occupational Medicine*. **1992**; 34(12): 1164-1172.

Shi, L. Health Promotion, medical care use, and costs in a sample of worksite employees. *Evaluation Review*. **1993**; 17(5): 475-487.

Part III: An Economic Analysis of Public Health Interventions that Promote Mental Wellbeing in the Workplace

Method

The studies included in the effectiveness review considered an extremely varied range of individual-level and organisational-level interventions. The measurement of health outcomes across the studies was equally varied. Despite the number of different outcome measures used, no study measured health effects in terms of QALYs gained. As a consequence, a rather pragmatic approach is adopted for the economic modelling.

- To generate incremental cost-effectiveness ratios (ICERs) broadly in line with the NICE reference case, it is necessary to base the analysis on only 3 studies from the effectiveness review (these are shown in the table below), where health outcomes are measured on a scale that can be converted, directly or indirectly, into QALYs gained.
- To generate estimates of the net-benefits to employers of work-site interventions that promote mental wellbeing in the workplace, evidence from the effectiveness review and other sources in the literature is used, in conjunction with standard methods to value health-related changes in foregone productivity due to absenteeism and presenteeism.

A single willingness-to-pay value from an American study is also used to provide an indication of the net-benefits of interventions to promote the mental wellbeing of employees from a social perspective.

Modelled interventions from effectiveness review

Study	Intervention Type	Intervention Component
Intervention 1: Bergdahl et al (2005)	Individual – stress management programme	<ul style="list-style-type: none"> • Group session per week for seven weeks (2-hr duration). Four groups of 6-7. • 2 psychologists per group per session. • Handouts for each session (unspecified).
Intervention 2: Jones and Johnston (2000)	Individual – stress management programme	<ul style="list-style-type: none"> • 6 group sessions (2-hr duration). • 1 trained facilitator per session. • Handouts for each session (unspecified). • Incentives to participate (one-off prize and reimbursement of travel expenses).
Intervention 3: Butterworth et al (2006)	Individual – stress management programme	<ul style="list-style-type: none"> • Health coaching with minimum of 1 initial session + 2 follow-up contacts; each session = 30 minutes. • Each session run by trained health professional (unspecified). • Independent verification (unspecified).

Results

The results of the economic analysis are summarised in the following key *evidence statements*:

Evidence Statement 1

Work-site interventions to promote the mental wellbeing of employees can reduce absence costs by between £145 and £1,295 per affected employee per year, and reduce presenteeism costs by between £350 and £3,865 per

affected employee per year. Note: there is considerable uncertainty surrounding the estimated reductions in presenteeism costs.

Such interventions can therefore save employers between £495 and £5,160 per affected employee per year.

Evidence Statement 2

The net-benefit to employers of implementing interventions to promote the mental wellbeing of employees ranges from negative £220 to positive £1,155 per affected employee participating in the programme, incorporating solely the intervention-induced reductions in absence costs.

Including the intervention-induced reductions in presenteeism as well, the net-benefit to employers ranges from positive £130 to positive £5,020 per affected employee participating in the programme.

Evidence Statement 3

For the 3 modelled interventions, ICERs range from about £3,470 per QALY gained to £15,030 per QALY gained. However, these values do not include any benefits accruing to employers due to reductions in absenteeism and presenteeism.

When the benefits of intervention-induced reductions in absenteeism and presenteeism are included in the cost component of the ICER, the ratios become negative – i.e. relative to the baseline of ‘do nothing’ all 3 modelled interventions are dominant, resulting in reduced costs and increased health benefits.

There is, however, considerable uncertainty surrounding the combining of effectiveness evidence on intervention-induced reductions in absenteeism and presenteeism with effectiveness evidence on intervention-induced QALY gains, since both sets of evidence are sourced from different studies.

Evidence Statement 4

The net (social) benefit of interventions to promote the mental wellbeing of employees ranges from positive £115 to positive £420 per participating employee. This indicates that such interventions increase total social welfare.

These are conservative estimates, since (i) the value to the employer of intervention-induced reductions in absenteeism and presenteeism are not included and (ii) any savings in NHS resources due to reductions in work-related stress, depression and anxiety are also not included.

There is nonetheless considerable uncertainty surrounding the estimates, since they are based on a single WTP value from an American stated preference survey.

Conclusions

The results of the economic modelling support the business case for implementing work-site interventions to promote the mental wellbeing of employees.

Due to the lack of a consistent and robust effectiveness evidence on which to base the economic evaluation, a pragmatic approach to the modelling is adopted. However, this necessitates the adoption of a number of assumptions, which inevitably increases the uncertainty surrounding the results. Consequently, the evidence statements listed above should only be viewed as indicative, and the underlying uncertainty should be taken into account when developing guidelines to promote the mental wellbeing of employees in the workplace.

References

Bergdahl, J., Larsson, A., Nilsson, L-G., et al. Treatment of chronic stress in employees: subjective, cognitive and neural correlates. *Scandinavian Journal of Psychology*. 2005; 46: 395-402.

Butterworth, S., Linden, A., McClay, W. and Leo, M. Effect of motivational interviewing-based health coaching on employees' physical and mental health state. *Journal of Occupational Health Psychology*. 2006; 11(4): 358-365.

Jones, M. and Johnston, D. Evaluating the impact of a worksite stress management programme for distressed student nurses: a randomised control trial. *Psychology and Health*. 2000; 15: 689-706.