

Preventive staff-support interventions for health workers (Review)

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TABLE OF CONTENTS

HEADER	1
ABSTRACT	1
PLAIN LANGUAGE SUMMARY	2
BACKGROUND	2
OBJECTIVES	3
METHODS	3
RESULTS	4
Figure 1.	7
Figure 2.	8
Figure 3.	8
Figure 4.	9
Figure 5.	9
Figure 6.	9
Figure 7.	10
Figure 8.	10
Figure 9.	10
Figure 10.	11
DISCUSSION	11
AUTHORS' CONCLUSIONS	12
ACKNOWLEDGEMENTS	12
REFERENCES	12
CHARACTERISTICS OF STUDIES	14
DATA AND ANALYSES	20
Analysis 1.1. Comparison 1 Stress management vs no intervention, Outcome 1 Job stress.	21
Analysis 1.2. Comparison 1 Stress management vs no intervention, Outcome 2 Job satisfaction.	22
Analysis 1.3. Comparison 1 Stress management vs no intervention, Outcome 3 Burnout (Emotional exhaustion).	22
Analysis 2.1. Comparison 2 Assertiveness training vs. in-service training, Outcome 1 Job stress.	23
Analysis 3.1. Comparison 3 Mindfulness training vs no intervention, Outcome 1 Burnout (Emotional exhaustion).	23
Analysis 3.2. Comparison 3 Mindfulness training vs no intervention, Outcome 2 Job satisfaction.	24
Analysis 4.1. Comparison 4 Management intervention vs no intervention, Outcome 1 Absence.	24
Analysis 4.2. Comparison 4 Management intervention vs no intervention, Outcome 2 Job stress.	25
Analysis 4.3. Comparison 4 Management intervention vs no intervention, Outcome 3 Job satisfaction.	25
Analysis 5.1. Comparison 5 Career identity training vs no intervention, Outcome 1 Job stress.	26
APPENDICES	26
HISTORY	31
CONTRIBUTIONS OF AUTHORS	32
DECLARATIONS OF INTEREST	32
SOURCES OF SUPPORT	32
DIFFERENCES BETWEEN PROTOCOL AND REVIEW	32

[Intervention Review]

Preventive staff-support interventions for health workers

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ABSTRACT

Background

Healthcare workers need to be supported to maintain sufficient levels of motivation and productivity, and to prevent the debilitating effects of stress on mental and physical well-being.

Objectives

To assess the effects of preventive staff-support interventions to healthcare workers.

Search strategy

We searched The Cochrane Effective Practice and Organisation of Care Group (EPOC) Specialised Register (and the database of studies awaiting assessment), Biblioweb (searched 28 August 2008); The Cochrane Central Register of Controlled Trials (*The Cochrane Library* 2008, Issue 3) (searched 28 August 2008); MEDLINE, Ovid 1950 to August Week 2 2008 (searched 26 August 2008); CINAHL, Ovid 1982 to August Week 4 2008 (searched 26 August 2008); EMBASE, Ovid 1980 to 2008 Week 34 (searched 26 August 2008); PsycINFO, Ovid 1806 to July Week 5 2008 (searched 27 August 2008); Sociological Abstracts, CBA 1952 to present (searched 28 August 2008).

Selection criteria

Randomised controlled trials of interventions to support healthcare workers in coping with work-related stress, preventing burnout and improving job satisfaction, without changing contractual conditions of service or physical work environment. Three types of interventions were included in this review: (1) support groups for staff; (2) training in stress management techniques; and (3) management interventions for supporting staff.

Data collection and analysis

Two authors independently performed study selection, quality assessments and data abstraction.

Main results

Ten studies involving 716 participants met the criteria for inclusion. None assessed the effects of support groups for health workers. Eight studies assessed the effects of training interventions in various stress management techniques on measures of stress and/or job satisfaction, and two studies assessed the effects of management interventions on stress, job satisfaction and absenteeism.

Preventive staff-support interventions for health workers (Review)

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1

Three studies demonstrated a beneficial effect of stress management training intervention on job stress. Only one of these showed that this effect is sustainable over the medium-term. One study demonstrated the beneficial effect of a high intensity, stress management training intervention on burnout. Low and moderate intensity stress management training interventions failed to demonstrate benefit on burnout or staff satisfaction.

Management interventions demonstrated increases in job satisfaction, but failed to show effect on absenteeism.

Most studies had several methodological shortcomings leaving them vulnerable to potential biases.

Authors' conclusions

There is insufficient evidence for the effectiveness of stress management training interventions to reduce job stress and prevent burnout among healthcare workers beyond the intervention period. Low quality evidence suggests that longer-term interventions with refresher or booster sessions may have more sustained positive effect, but this needs to be rigorously evaluated in further trials.

Low quality evidence exists to show that management interventions may improve some measures of job satisfaction. However, further trials are needed to assess whether this finding is replicable in other settings. There was insufficient evidence of the benefit of management interventions on staff absenteeism.

Rigorous trials are needed to assess the effects of longer-term stress management training and management interventions in primary care and developing country settings.

PLAIN LANGUAGE SUMMARY

Preventive staff-support interventions for health workers

Health workers need to be supported to reduce job-related stress, prevent burnout and improve motivation. This review identified 10 studies involving 716 health workers aimed at assessing the effects of preventive staff-support interventions. Eight studies involved short to medium-term training in stress management techniques, given predominantly to nurses in secondary and tertiary care settings. Four of these studies demonstrated beneficial effects of stress management training interventions in reducing some measures of job-related stress over the short-term. However, due to inadequate follow-up it is not clear whether these benefits are sustainable over longer periods. Most studies had several methodological shortcomings. Two studies involved management interventions to improve job satisfaction and absenteeism. The evidence from these two studies is insufficient to conclude that there is clear benefit from management interventions for staff support.

BACKGROUND

In order for healthcare workers to render quality care, they have to feel cared for. Having social support helps health workers cope with work-related stress (Lees 1990). Explorative studies have shown that staff who are supported show greater confidence, collegiality and an understanding of their own and others' emotional reactions in their care for patients (Frost 1991). This leads to better patient outcomes such as increased satisfaction, adherence and improvements in morbidity and mortality as a result of improvements in the care provided by healthcare workers (Franco 2002). Patients may have shorter lengths of stay and less likelihood of re-admittance, which have significant effects on the cost of health care. The success of health service delivery depends on the willingness of health workers to apply themselves in their tasks (health worker

motivation), in addition to having adequate resources and worker competency (Franco 2000).

Staff support can be seen as one of the central tasks of management (Davidhizar 1992). Occupational stress management programmes can be classified on three levels based on the public health approach: primary, secondary and tertiary prevention (Reynolds 1997). Organisationally-based initiatives that aim to eliminate causal factors of stress, through changing job or work environment characteristics, could be classified as primary prevention. Individual level interventions that aim to treat or cure existing disorders or problems could be classified as tertiary prevention. The last-mentioned are usually part of employee assistance programmes and include counselling, psychotherapy, debriefing, medical treat-

ment and rehabilitation activities such as physiotherapy and occupational therapy. Secondary prevention programmes in staff support aim to reduce the severity or duration of stress and to avoid the development of more serious, chronic or other disabling conditions. Secondary prevention programmes aim to reduce the individual's experiences of job stress by educating employees to manage job stress better (improved coping mechanisms) and by creating supportive structures to buffer organisational stresses through improved management processes and support groups. This strategy focuses staff-support interventions at the individual level as well as the interface between the individual (health worker) and the organisation (health system) (Bolle 1988).

The current review focuses on secondary prevention strategies (i.e. preventive staff-support interventions) to reduce job stress, prevent burnout and improve worker motivation (job satisfaction) and performance outcomes. Specific intervention types of interest include training interventions in stress management, interventions to improve management processes, and support groups for staff support.

Previous reviews (DeFrank 1987; Murphy 1996; Van der Hek 1997) have been published on the effects of occupational stress management programmes within designated time periods, but these were not extensive enough to exclude publication bias and reviewers have not paid sufficient attention to methodological quality. The scope of these reviews was broad and that has weakened their ability to provide strong evidence of effect. Another review (Marine 2006) investigated the effectiveness of work and person-directed interventions in occupational stress prevention for health-care workers. This review focuses on with stress and burnout as primary outcome measures; and psychological and physical symptoms, and physiological parameters as secondary outcome measures. Whereas stress and burnout are undoubtedly important outcomes, broader aspects of staff support such as staff retention, motivation and health worker performance (Franco 2000; Franco 2002) should be considered in order to inform current human resource development challenges in health systems globally, and in middle- and low-income countries in particular (Lehmann 2008; Mathauer 2006). Further reviews into the occupational health of health workers should therefore extend the scope of interventions and outcomes to address human resource management concerns such as health worker motivation, job satisfaction, turnover and other performance measures (e.g. absenteeism and productivity).

Given the constant nature of change within health systems globally (Franco 2002; WHO 2000), health workers and their direct managers are faced with situations where they have little control over organisational processes (Fulop 2005; Van der Walt 2002). In these circumstances, it may be useful to provide health managers with evidence about the effects of preventive staff-support interventions that aim to help staff cope with occupational stress and improve health worker motivation for improved health worker performance (Chopra 2008). Other reviews of interventions aimed

to improve health worker motivation and/or retention in developing countries (Willis-Shattuck 2008), and health worker performance (Dieleman 2009), included both qualitative and quantitative studies, and described only conditions under which these intervention *can* work, rather than observed effectiveness of the interventions. The need for preventive staff-support interventions is paramount in resource-poor settings, as improvements in job satisfaction may counter staff movements to better paying positions and jobs within the country and abroad (Lehmann 2008).

OBJECTIVES

To determine the effects of preventive staff-support interventions for health workers.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs).

Types of participants

Professional health workers and health teams working in primary, secondary, tertiary, community, residential and referral care settings.

Exclusions: Volunteers (e.g. lay health workers) and non-paid health workers (e.g. trainee health workers) were excluded, because these categories are usually either not long-term placements within work settings or managed by outsider organisations.

Types of interventions

We included any intervention intended to improve health workers' ability to cope or manage job stress. These include:

- (a) formal and informal staff-support groups;
- (b) training or education in coping skills (or stress management) and communication;
- (c) management interventions, e.g. multidisciplinary meetings, feedback sessions, etc.

Exclusions:

- (i) We excluded interventions that change job (contractual conditions) or work environment characteristics, because interventions are instituted at organisation level (by senior management and policy makers), and by definition primary prevention.
- (ii) We excluded interventions that aim to cure or treat individuals or groups with stress-related problems and disorders, because

these are resource-dependent and often not feasible in resource-constraint settings. These interventions are by definition tertiary prevention.

Types of outcome measures

We included studies if they assessed one or more of the following outcomes:

1. absenteeism;
2. turnover;
3. burnout;
4. productivity;
5. job stress;
6. job satisfaction, staff morale or work motivation.

Search methods for identification of studies

We searched the following databases:

- The Cochrane Effective Practice and Organisation of Care Group (EPOC) Specialised Register (and the database of studies awaiting assessment), Biblioweb (searched 28 August 2008)
- The Cochrane Central Register of Controlled Trials (*The Cochrane Library* 2008, Issue 3) (searched 28 August 2008)
- MEDLINE, Ovid 1950 to August Week 2 2008 (searched 26 August 2008)
- EMBASE, Ovid 1980 to 2008 Week 34 (searched 26 August 2008)
- CINAHL, Ovid 1982 to August Week 4 2008 (searched 26 August 2008)
- PsycINFO, Ovid 1806 to July Week 5 2008 (searched 27 August 2008)
- Sociological Abstracts, CBA 1952 to present (searched 28 August 2008)

Data collection and analysis

Selection of studies

One author screened titles and abstracts of the electronic search results and retrieved any likely studies. If the abstract was unavailable, we retrieved the full text paper. We considered studies published in all languages for inclusion. We used a standard form for determining inclusion/exclusion of studies. Where abstracts were in a language other than English, a health worker with Masters-level qualification or equivalent experience, who was a native-speaker in that language, was given the inclusion/exclusion criteria form and asked to complete. We retrieved full text copies of all articles that were identified as potentially relevant.

Two authors independently assessed the retrieved articles for inclusion/exclusion based on the criteria set out for eligibility of studies.

Disagreement was resolved through discussion. If no agreement was reached, a third author resolved the disagreement. We documented reasons for exclusion of studies in the 'Characteristics of excluded studies' table.

Assessment of risk of bias

Two authors independently assessed the potential risk of bias of eligible studies using the standard EPOC criteria for RCTs. We assessed studies as low risk of bias if they reported allocation concealment and had higher than 80% follow-up of participants. Where this information was unclear from the reporting, we contacted the author for clarification.

Data extraction

Two authors independently extracted the following information from the eligible studies: type of setting, professional background of participants, information about the type and nature of the intervention, primary and secondary interventions, the intervention agent, description of the controls used, and selected staff outcomes measured. If studies used a cross-over design, we compared the results from just after the implementation of the intervention in the intervention group with the results in the concurrent wait-list control group.

In the event of any missing data we contacted the authors of the studies, where possible, for more information. We resolved any discrepancies or differences through discussion and the confirmation of a third author.

RESULTS

Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#).

Electronic searching identified 7148 titles or abstracts written both in English and foreign languages. A set of 172 potentially eligible studies were identified, and we ordered full text articles of these studies. Upon further scrutiny of eligible studies, only 10 met the inclusion criteria (Lee 1994; Lökk 2000; Mackenzie 2006; Reynolds 1993; Rowe 1999; Tsai 1993; Von Baeyer 1983; Weir 1997; West 1984; Yamagishi 2008). All included studies were published in English language journals. The main reasons for excluding studies were study design (not RCTs) and participants (did not involve healthcare professionals as recipients of interventions). One study (Lökk 1997) was excluded because the study was the same as another (Lökk 2000), but reporting a different set of results. It was decided to include the last-mentioned as the reported

outcomes were in line with the primary outcomes intended for this review.

Studies were heterogeneous with respect to interventions, comparison groups and outcome measures. Accordingly, we made no attempt to pool their results using a meta-analysis.

Participants

All the studies were conducted in developed countries: five studies in North America (three in USA and two in Canada), and three in Asia (two in Taiwan and one in Japan). Most studies were conducted in tertiary (n = 4) and secondary (n = 4) care settings. Two studies involved participants from various care settings including tertiary, secondary, residential, community and referral care settings.

A total of 716 health workers were included in the 10 studies. The majority of them were nurses of various ranks, from nurse managers to nursing aides (seven studies). Three studies targeted a mixture of healthcare professionals. Only one study targeted a healthcare team as a unit (Weir 1997).

Interventions

Types of interventions

a) Stress management training

Eight studies assessed the effects of training interventions in identification and management of stress or in a specific stress management technique. Four of these interventions involved training to increase awareness of situations at work that causes stress, and how to respond in ways to reduce stress (Reynolds 1993; Rowe 1999; Von Baeyer 1983; West 1984). The specific techniques taught in the stress management training interventions included assertiveness (Lee 1994), mindfulness (Mackenzie 2006) and relaxation (Tsai 1993). Another study (Yamagishi 2008) involved career identity training where participants were taught how to define their career identity and how to do career goal management and planning.

b) Management interventions

Two studies assessed the effects of management interventions on staff absenteeism and job satisfaction. One study assessed an intervention involving process consultation for nurse managers to improve their problem solving ability in interdisciplinary staff teams (Weir 1997). The other study assessed the effect of an intervention aimed at improving managers' ability to manage organisational change on job satisfaction (Lökk 2000).

c) Support interventions

No studies were found that evaluated the effects of support groups on job stress or performance.

d) Control groups

Six studies had "no intervention" control groups; two included traditional in-service education and one study involved the passive attendance of the psychologist to the staff meetings for the control group. Only one study (West 1984) compared alternative intensities of the intervention against each other.

Mode of delivery

With the exception of one study (Yamagishi 2008), which delivered a web-based training, the interventions were provided by a mental health professional (n = 5) or an experienced nurse with a post-graduate qualification (n = 3). One study did not report the intervention agent.

Duration of interventions

Duration of interventions ranged from one session lasting 60 minutes to 24 months. The studies assessed mostly short- to medium-term interventions. Four studies (Lee 1994; Tsai 1993; Von Baeyer 1983; Yamagishi 2008) assessed interventions with a duration of less than four weeks; another four interventions (Lökk 2000; Mackenzie 2006; Reynolds 1993; West 1984) lasted between one and five months. Only two studies (Rowe 1999; Weir 1997) had concentrated interventions that lasted more than five months: 12 and 24 months, respectively.

Intensity of interventions

The intensity of interventions varied between studies. Interventions ranged from one 60-minute session to three full-day workshops plus individual consultations with participants. Most studies (n = 6) reported moderate intensity in interventions with more than six hours of contact time with participants (Lee 1994; Lökk 2000; Mackenzie 2006; Reynolds 1993; West 1984; Weir 1997). Three studies assessed low intensity stress management training interventions with three hours or less of contact time with participants (Tsai 1993; Von Baeyer 1983; Yamagishi 2008). One study (West 1984) compared several interventions ranging from two to eight hours of contact time, and various combinations of content (additional skills) and modes of intervention (with and without application exercises).

Outcomes

Most studies reported multiple measures of effect and many did not specify a primary outcome. In some cases the primary outcome was deduced from the publication title. In other cases, outcomes were chosen from the list of outcomes as per review protocol. Most studies (n = 8) reported measures of job stress using a variety of measurement scales. Three studies (Mackenzie 2006; Rowe 1999; West 1984) reported measures of burnout using the Maslach Burnout Inventory (MBI). For these studies, the *emotional exhaustion* subscale was used as a measure of job stress. Three

studies (Lökk 2000; Mackenzie 2006; Reynolds 1993) reported measures of job satisfaction, albeit with different scales.

Only one study (Weir 1997) reported an objective measure: mean hours of absenteeism.

None of the included studies reported paying attention to power or doing a priori sample size calculation. Only three studies (Rowe 1999; Tsai 1993; Weir 1997) had samples totalling more than 100 healthcare workers.

Timing of last outcome measurement varied. Five studies (Mackenzie 2006; Tsai 1993; Von Baeyer 1983; Weir 1997; Yamagishi 2008) measured the outcome within one month after the intervention; i.e. short-term effect of intervention. Four studies (Lee 1994; Lökk 2000; Reynolds 1993; West 1984) had the last

follow-up measurement between one and six months after intervention - medium-term effect. Only one study assessed the long-term effect of the intervention by having a follow-up measurement at 12 months after the intervention (Rowe 1999).

Risk of bias in included studies

Assessments of risk of bias in included studies are shown in additional Table 1 and Table 2. Two studies were assessed as low risk of bias (Rowe 1999; Weir 1997). The remaining studies had several methodological shortcomings, leaving them at high risk of potential biases.

Table 1. Methodological quality assessment using EPOC criteria for included studies

Study	Allocation procedure	Level of allocation	Baseline measure	Primary outcome	Loss to follow-up	Contamination	Assessors blinded	Intention-to-treat	Unit analysis error
Lee 1994	Unclear	Done	Done	Done	Done	Unclear	Unclear	Done	Done
Lökk 2000	Unclear	Done	Not done	Done	Done	Done	Not done	Done	Not done
Mackenzie 2006	Unclear	Done	Unclear	Done	Done	Done	Unclear	Done	Done
Reynolds 1993	Unclear	Done	Done	Done	Not done	Done	Not done	Done	Done
Rowe 1999	Done	Done	Done	Done	Done	Done	Not done	Done	Done
Tsai 1993	Done	Done	Not done	Done	Done	Done	Not clear	Not clear	Not done
Von Baeyer 1983	Done	Done	Done	Done	Done	Done	Done	Done	Done
Weir 1997	Done	Done	Done	Done	Done	Not done	Done	Done	Done
West 1984	Unclear	Done	Done	Done	Done	Unclear	Not done	Done	Done
Yamagishi 2008	Unclear	Done	Not done	Not done	Not done	Done	Unclear	Done	Done

Table 2. Methodological quality summary scores for all included studies

Study	Summary score
Lee 1994	Low

Table 2. Methodological quality summary scores for all included studies (Continued)

Löck 2000	Low
Mackenzie 2006	Low
Reynolds 1993	Low
Rowe 1999	High
Tsai 1993	Low
Von Baeyer 1983	Low
Weir 1997	High
West 1984	Low
Yamagishi 2008	Low

Allocation concealment was scored as 'done' in four studies (Rowe 1999; Tsai 1993; Von Baeyer 1983; Weir 1997). For the rest of the studies allocation concealment was scored as 'unclear'. It has been shown that studies that fail to report allocation concealment may overestimate the intervention effect by 41% and studies that incompletely report allocation concealment may overestimate the intervention effect by 30% (Schulz 1995).

Loss to follow-up was scored as 'done' in most studies (n = 8). One trial with a cluster-randomised control design, although no loss of clusters, reported response rates of 52% and 41% at the beginning and end of the study, respectively, which could introduce a potential bias in the findings. Two studies reported attrition exceeding 20%.

Intention-to-treat analysis was 'done' in all studies, except one, where it was not clearly reported.

Effects of interventions

A) Stress management training interventions

Effects on job stress

Three studies reported a beneficial effect of stress management training interventions on perceived stress among healthcare workers (Lee 1994; Reynolds 1993; Tsai 1993). These interventions can be classified as medium-term (between one and six months in duration) with moderate intensity (more than six hours of contact time with participants). Only one of these studies (Lee 1994) demonstrated evidence of the benefit of stress management training intervention in reducing job stress over the medium term, showing a mean difference of -6.10 (95% CI -8.39, -3.81) on the Perceived Stress Scale after one month (post-intervention) among (favouring) nurses who received assertiveness training (Figure 1). The results of Reynolds 1993 show no immediate difference in psychological distress between health workers who received six sessions of stress management training: standardised mean difference -0.50; 95% CI -1.00 to 0.01 (Figure 2). Tsai 1993 reports reductions in perceived stress for nurses following training in relaxation techniques ($F(1132) = 5.69, P < .05$).

Figure 1. Forest plot of comparison: 3 Assertiveness training vs. in-service training, outcome: 3.1 Job stress.

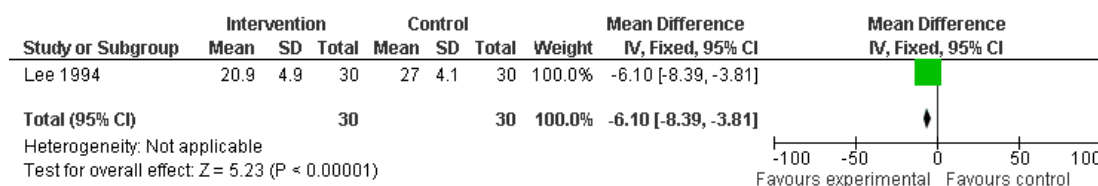
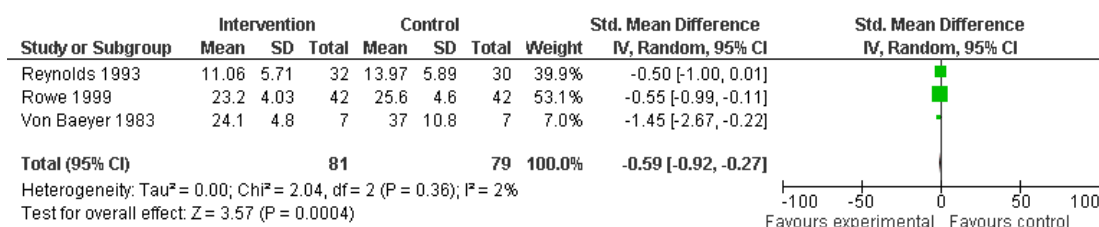
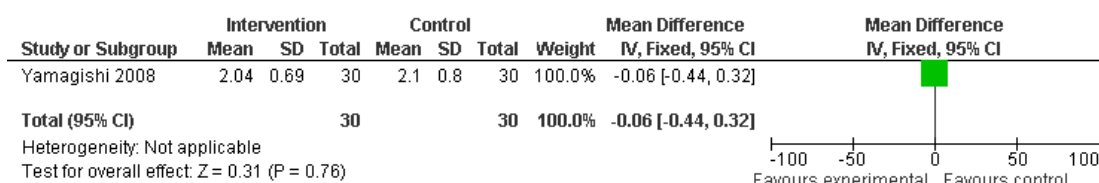


Figure 2. Forest plot of comparison: I Stress management vs no intervention, outcome: I.2 Job stress.



Brief, low intensity training interventions in stress management techniques failed to demonstrate benefits in stress reductions resulting from the intervention. The results of Yamagishi 2008 show that 60 minute web-based career identity training did not improve anxiety among nurses in the experimental group (mean difference -0.06; 95% CI -0.44 to 0.32; Figure 3). The results of Von Baeyer 1983 show a marginal benefit on the state-subscale of State and Trait Anxiety Index among health workers who received 3 sessions of stress management training: standardised mean difference -1.45; 95% CI -2.67 to 0.22 (Figure 2).

Figure 3. Forest plot of comparison: 5 Career identity training vs no intervention, outcome: 5.1 Job stress.



One study (West 1984) compared various levels of intensity in stress management training interventions, and demonstrated that greater benefit in reductions in job stress is derived as the level of intensity of the intervention increases.

Effects on burnout

One study (Rowe 1999) demonstrated a beneficial effect of a high intensity, concentrated stress management training intervention on all measures of burnout after 2 years follow-up: mean difference for emotional exhaustion: -6.00; 95% CI -8.16 to -3.84 (Figure 4). A brief, low intensity training interventions in mindfulness training (Mackenzie 2006) did not reduce burnout: mean difference for emotional exhaustion: 3.44; 95% CI -4.10 to 10.98 (Figure 5).

Figure 4. Forest plot of comparison: 1 Stress management vs no intervention, outcome: 1.3 Burnout (Emotional exhaustion).

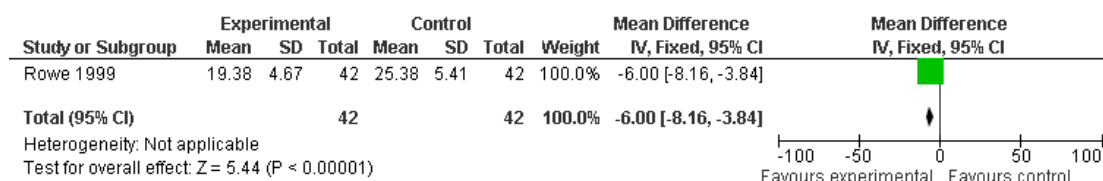
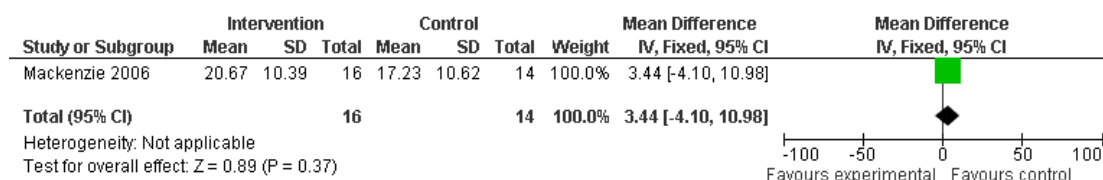


Figure 5. Forest plot of comparison: 4 Mindfulness training vs no intervention, outcome: 4.1 Job stress.



One study (West 1984) compared various levels of intensity in stress management interventions, and demonstrated that greater benefit in reductions in burnout measures is derived as the level of intensity of the intervention increases.

Effects on job satisfaction

Two studies (Mackenzie 2006; Reynolds 1993) assessed the effects of stress management training interventions on job satisfaction. Neither study - using low and moderate levels of intensity in training interventions, respectively - demonstrated a positive effect of

the intervention on job satisfaction over the short (less than one month after the intervention) or medium term (between one and six months after the intervention). The results of Mackenzie 2006 show no difference in job satisfaction among nurses and nurse aides who received four sessions of mindfulness training: mean difference 1.48; 95% CI -4.81 to 7.77 (Figure 6). The results of Reynolds 1993 show no difference in job satisfaction between health workers who received six sessions of stress management training post-intervention: mean difference -0.13; 95% CI -0.53 to 0.27 (Figure 7).

Figure 6. Forest plot of comparison: 3 Mindfulness training vs no intervention, outcome: 3.2 Job satisfaction.

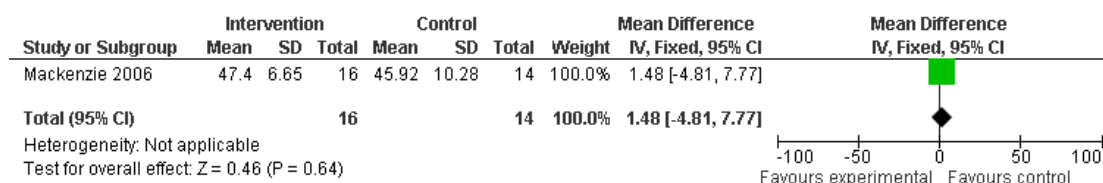
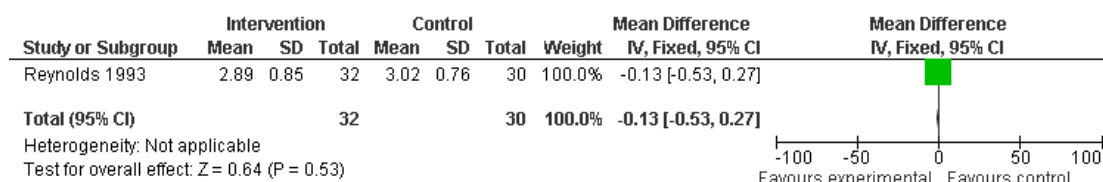


Figure 7. Forest plot of comparison: 1 Stress management vs no intervention, outcome: 1.3 Job satisfaction.

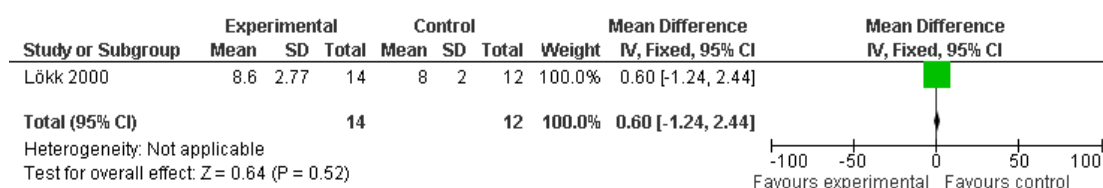


B) Management interventions

Effects on job stress

The change management intervention (Lökk 2000) demonstrated no effect on job stress on 30 week follow-up measure after the intervention, compared to the control group: mean difference 0.60; 95% CI -1.24 to 2.44 (Figure 8).

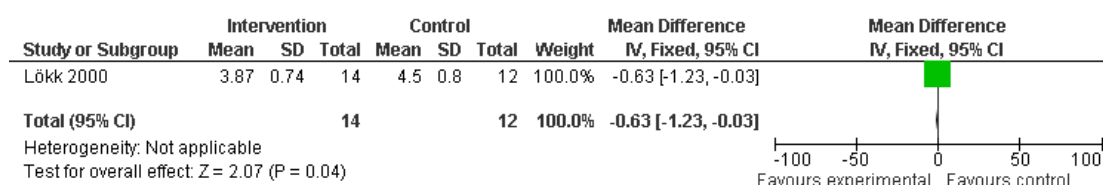
Figure 8. Forest plot of comparison: 2 Management intervention vs no intervention, outcome: 2.2 Job stress.



Effects on job satisfaction

The change management intervention (Lökk 2000) demonstrated a small beneficial effect on job satisfaction among the intervention group on 30 week follow-up measure after the intervention, compared to the control group: mean difference -0.63; 95% CI -1.23 to -0.03 (Figure 9).

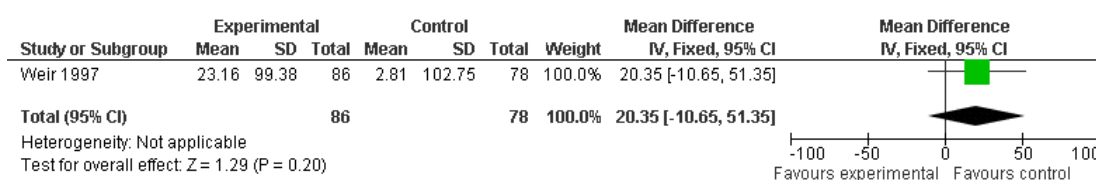
Figure 9. Forest plot of comparison: 2 Management intervention vs no intervention, outcome: 2.3 Job satisfaction.



Effects on absenteeism

One study (Weir 1997) measured the effect of a management intervention to improve process consultation between nurse managers and staff on mean hours of absence of staff working in a community hospital, but found no difference in absence between intervention and control groups: mean difference 20.35; 95% CI -10.65 to 51.35 (Figure 10).

Figure 10. Forest plot of comparison: 2 Management intervention vs no intervention, outcome: 2.1 Absence.



C) Support group interventions

None of the reviewed studies investigated the effects of support groups on staff-support outcomes.

DISCUSSION

A major limitation of this review is the heterogeneity of interventions and the wide range of outcomes measured. Most studies reported measures on two scales or more, each with several sub-scales. In the presence of numerous outcome measures on one scale, it was not clear whether significant differences found and reported were real or the result of chance. The psychometric tests used, though well-established and validated, provide no guidance to indicate whether scores achieved on sub-scales are clinically meaningful. Further to that, the tests do not yield composite scores for ease of use as summary statistics or in comparing outcomes across studies. In the absence of these, meaningful differences reported in the studies should be interpreted with great caution.

This review found no evidence to support the use of brief stress management training interventions to reduce job stress among health workers. Low quality evidence was found to support the

effectiveness of stress management training interventions of moderate intensity (more than six hours of contact) over one month or longer, to reduce job stress among health workers over the short-term. However, these beneficial effects diminished, in the absence of refresher or booster sessions, beyond one month post-intervention. There is strong evidence to support the effectiveness of an intensive, long-term stress management training intervention on reducing job stress and risk of burnout among a wide range of health workers in various settings. Stress management training interventions should therefore include periodic refresher sessions up to 18 months post-intervention to maintain beneficial effects of the training beyond the intervention.

The content and nature of the stress management training varied greatly. It would be useful to compare the curriculum content in various training interventions to assess which holds greater potential for benefit. However, due to differences in outcome measures as well as duration of interventions, this was not possible in the current review. With the addition of more trials in the future this may be possible. Furthermore, the quality of reporting of the curriculum content of various training interventions varied, and was in many instances insufficient for making comparisons between interventions. Future studies should pay attention to detailed reporting of the curriculum content of training interventions, to facilitate comparing with other studies.

We did not perform sensitivity analysis based on differences in

quality of studies, context or type of health worker, since very few studies reported strong effects.

With regard to management interventions, we found insufficient evidence that an intervention that improves managers' ability to buffer organisational stress through improved problem solving ability affects staff absenteeism. This study was assessed to have a low risk of bias. The lack of significance observed from the findings does signal the potential benefit of this type of intervention, given the high rates of attrition reported in this cluster-randomised controlled trial due to turnover. It was not clear whether the turnover reported over the study period was normative for this setting or related to the intervention. The nature of the intervention also meant that protecting against contamination was not possible.

It is surprising that none of the studies included in this review was conducted in low- or middle-income countries. Given the crisis in human resources for health reported on earlier, it is imperative that rigorous studies are conducted to assess effects of staff-support interventions for improved health worker performance and outcome measures in the abovementioned settings.

This review found few studies of high methodological quality. Future studies should pay attention to rigorous design, adequate sample sizes and long-term follow-up measures to provide a solid evidence base for decision-making about interventions in staff support in public healthcare systems.

AUTHORS' CONCLUSIONS

Implications for practice

Limited evidence is available for the effectiveness of stress manage-

ment training interventions to reduce stress and prevent burnout among healthcare workers beyond the intervention period. Indications are that longer-term interventions with refresher or booster sessions may have more sustained positive effect, but this needs to be rigorously evaluated in further trials.

There is limited evidence that management interventions can improve staff morale and job satisfaction, given that only two studies were identified. However, further trials are needed to assess whether these findings are replicable in other settings.

Implications for research

Rigorous trials are needed to assess the effects of longer-term stress management training and management interventions.

Trials are needed to evaluate the effects of staff-support groups on work-related stress, work performance and other staff outcomes for health workers. Future research should target primary care settings and developing countries.

Future research in preventive staff support should include robust outcome measures such as absenteeism, turnover and other measures of work performance.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Lee 1994

Methods	RCT	
Participants	60 nurses in secondary care in Taiwan	
Interventions	INTERVENTION: assertiveness training 6 x 2-hour sessions; 3 per week; over 2 weeks CONTROL: traditional in-service programme	
Outcomes	Perceived Stress Scale	
Notes	-	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

Löck 2000

Methods	Cluster-randomised trial	
Participants	26 Heath workers in tertiary care in Sweden	
Interventions	INTERVENTION: management intervention 10 x 1-hour sessions; over 20 weeks CONTROL: passive attendance by psychologist	
Outcomes	Stress Job satisfaction	
Notes	-	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

Mackenzie 2006

Methods	RCT
Participants	30 nurses and nurse aids in tertiary care in Canada
Interventions	INTERVENTION: mindfulness training 4 x 30 minute sessions; 1 per week over 4 weeks Didactic and experiential exercises CONTROL: no intervention
Outcomes	Maslach Burnout Inventory Job Satisfaction Scale
Notes	-

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

Reynolds 1993

Methods	RCT
Participants	62 female nurses, physiotherapists and occupational therapists in secondary and community care in UK
Interventions	INTERVENTION: stress management training 6 x 2-hour sessions; 1 per week over 6 weeks CONTROL: no intervention
Outcomes	General Health Questionnaire - 12 Job satisfaction
Notes	Incentive: time off work

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

Rowe 1999

Methods	RCT
Participants	126 nurses, hospital/clinical staff, physicians/surgeons, health administrators, psychologists/counsellors/ social workers, and health educators in primary, secondary, tertiary, community and referral care in USA

Rowe 1999 (Continued)

Interventions	INTERVENTION 1: stress management training: adaptive coping 6 x 90 min sessions over 24 months INTERVENTION 2: stress management training: adaptive coping + refresher 6 x 90-minute sessions over 24 months + 3 x 1-hour refresher sessions at month 5, 11, 17 CONTROL: no intervention
Outcomes	General Stress Scale Maslach Burnout Inventory
Notes	-

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	Adequate

Tsai 1993

Methods	RCT
Participants	137 nurses in tertiary care in Taiwan
Interventions	INTERVENTION: training in relaxation skills 2 x 90-minute sessions; over 2 weeks CONTROL: traditional in-service education about theory analysis
Outcomes	Nurse Stress Checklist
Notes	-

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	Adequate

Von Baeyer 1983

Methods	RCT
Participants	14 nurses in tertiary care in Canada
Interventions	INTERVENTION: stress inoculation training 3 x 1-hour sessions; over 8 days CONTROL: no intervention

Von Baeyer 1983 (Continued)

Outcomes	State and Trait Anxiety Index (STAI)	
Notes	-	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	Adequate

Weir 1997

Methods	Cluster-randomised trial	
Participants	13 clinical inpatient units in secondary care in USA Involving 13 nurse managers and 201 staff members	
Interventions	INTERVENTION: process consultation for nurse managers 3 x full-day workshops + individual consultations over 12 months CONTROL: no intervention	
Outcomes	Absenteeism	
Notes	-	

West 1984

Methods	RCT	
Participants	60 nurses in secondary care in USA	
Interventions	INTERVENTION 1: stress inoculation training 4 x 30-minute sessions; 1 per week over 4 weeks INTERVENTION 2: stress inoculation + coping skills training 4 x 60-minute sessions; 1 per week over 4 weeks INTERVENTION 3: stress inoculation training + exposure (application) 4 x 30-minute sessions + 4 x 60-minute sessions; 2 per week over 4 weeks INTERVENTION 4: stress inoculation + coping skills training + exposure (application) 4 x 60-minute sessions + 4 x 60-minute sessions; 2 per week over 4 weeks	
Outcomes	State and Trait Anxiety Index Maslach Burnout Inventory	
Notes	Incentives: time free from service; in-service credit	
<i>Risk of bias</i>		

West 1984 (Continued)

Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

Yamagishi 2008

Methods	RCT
Participants	60 nurses in secondary care in Japan
Interventions	INTERVENTION: web-based career identity training 1 x 60-minute session CONTROL: no intervention
Outcomes	Brief Job Stress Questionnaire
Notes	-

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	Unclear

RCT = randomised controlled trial

Characteristics of excluded studies [ordered by study ID]

de Boer 2004	Not healthcare professionals
Goode 1995	Not a RCT
Lökk 1997	Primary outcomes not reported

RCT = randomised controlled trial

DATA AND ANALYSES

Comparison 1. Stress management vs no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Job stress	3	160	Std. Mean Difference (IV, Random, 95% CI)	-0.59 [-0.92, -0.27]
2 Job satisfaction	1	62	Mean Difference (IV, Fixed, 95% CI)	-0.13 [-0.53, 0.27]
3 Burnout (Emotional exhaustion)	1	84	Mean Difference (IV, Fixed, 95% CI)	-6.0 [-8.16, -3.84]

Comparison 2. Assertiveness training vs. in-service training

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Job stress	1	60	Mean Difference (IV, Fixed, 95% CI)	-6.10 [-8.39, -3.81]

Comparison 3. Mindfulness training vs no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Burnout (Emotional exhaustion)	1	30	Mean Difference (IV, Fixed, 95% CI)	3.44 [-4.10, 10.98]
2 Job satisfaction	1	30	Mean Difference (IV, Fixed, 95% CI)	1.48 [-4.81, 7.77]

Comparison 4. Management intervention vs no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Absence	1	164	Mean Difference (IV, Fixed, 95% CI)	20.35 [-10.65, 51.35]
2 Job stress	1	26	Mean Difference (IV, Fixed, 95% CI)	0.60 [-1.24, 2.44]
3 Job satisfaction	1	26	Mean Difference (IV, Fixed, 95% CI)	-0.63 [-1.23, -0.03]

Comparison 5. Career identity training vs no intervention

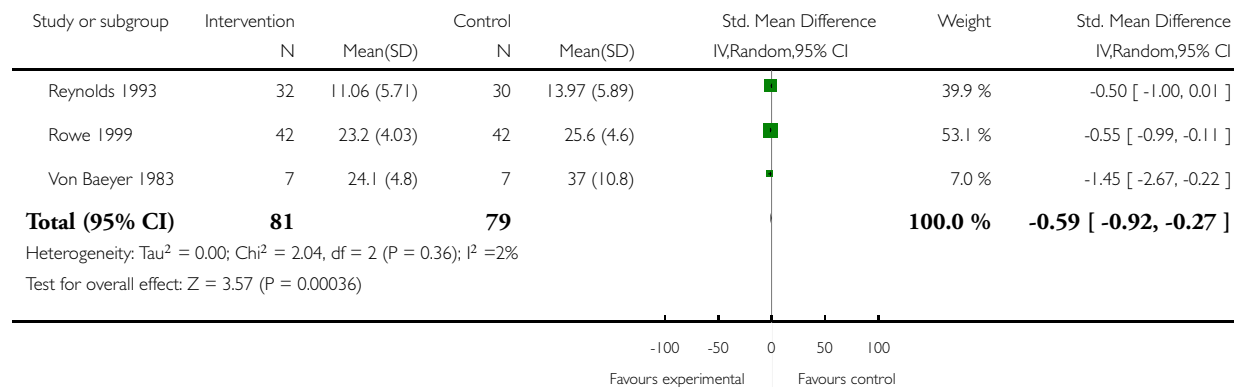
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Job stress	1	60	Mean Difference (IV, Fixed, 95% CI)	-0.06 [-0.44, 0.32]

Analysis 1.1. Comparison 1 Stress management vs no intervention, Outcome 1 Job stress.

Review: Preventive staff-support interventions for health workers

Comparison: 1 Stress management vs no intervention

Outcome: 1 Job stress

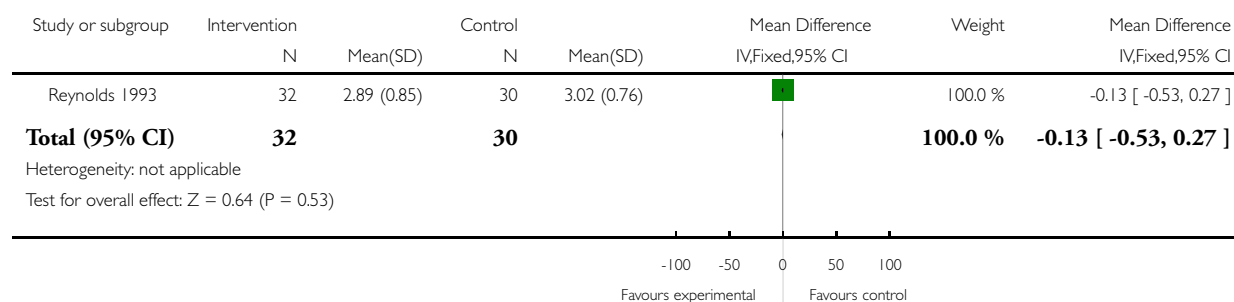


Analysis 1.2. Comparison 1 Stress management vs no intervention, Outcome 2 Job satisfaction.

Review: Preventive staff-support interventions for health workers

Comparison: 1 Stress management vs no intervention

Outcome: 2 Job satisfaction

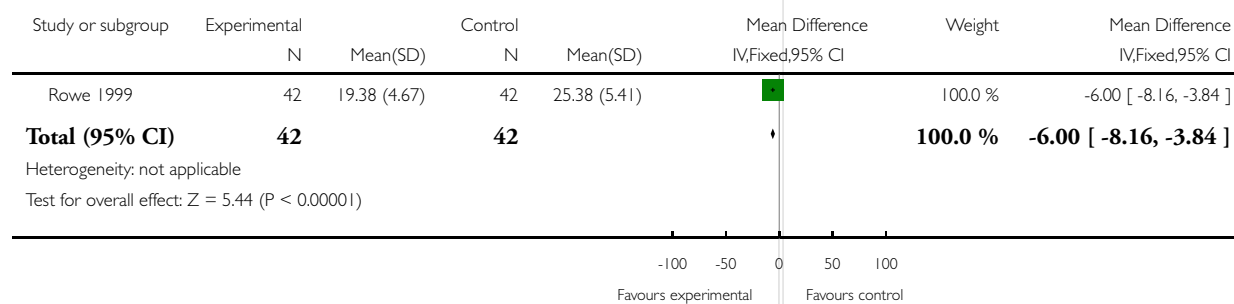


Analysis 1.3. Comparison 1 Stress management vs no intervention, Outcome 3 Burnout (Emotional exhaustion).

Review: Preventive staff-support interventions for health workers

Comparison: 1 Stress management vs no intervention

Outcome: 3 Burnout (Emotional exhaustion)

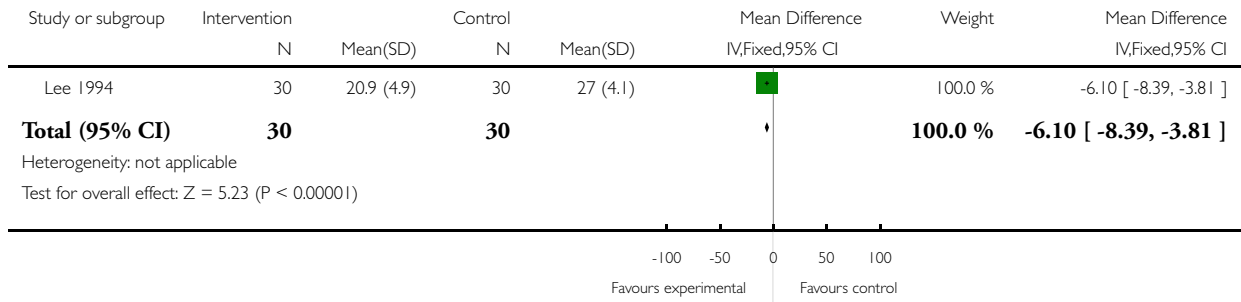


Analysis 2.1. Comparison 2 Assertiveness training vs. in-service training, Outcome 1 Job stress.

Review: Preventive staff-support interventions for health workers

Comparison: 2 Assertiveness training vs. in-service training

Outcome: 1 Job stress

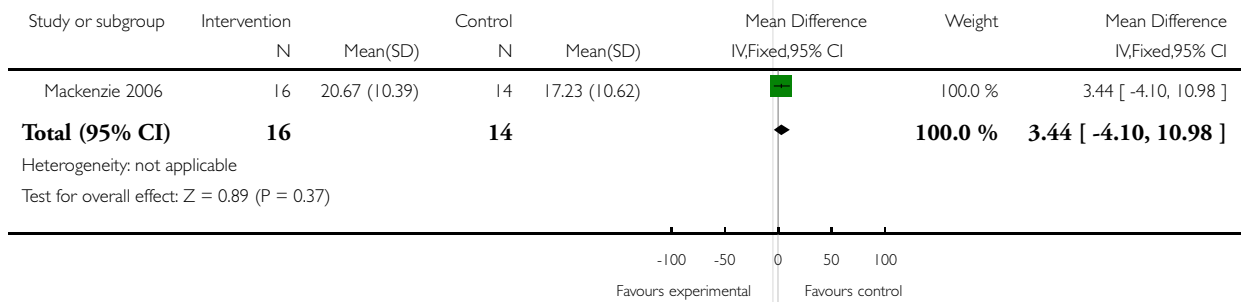


Analysis 3.1. Comparison 3 Mindfulness training vs no intervention, Outcome 1 Burnout (Emotional exhaustion).

Review: Preventive staff-support interventions for health workers

Comparison: 3 Mindfulness training vs no intervention

Outcome: 1 Burnout (Emotional exhaustion)

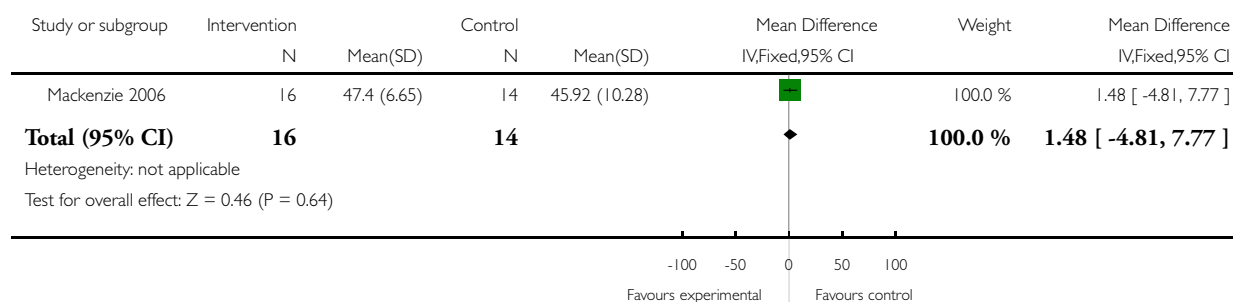


Analysis 3.2. Comparison 3 Mindfulness training vs no intervention, Outcome 2 Job satisfaction.

Review: Preventive staff-support interventions for health workers

Comparison: 3 Mindfulness training vs no intervention

Outcome: 2 Job satisfaction

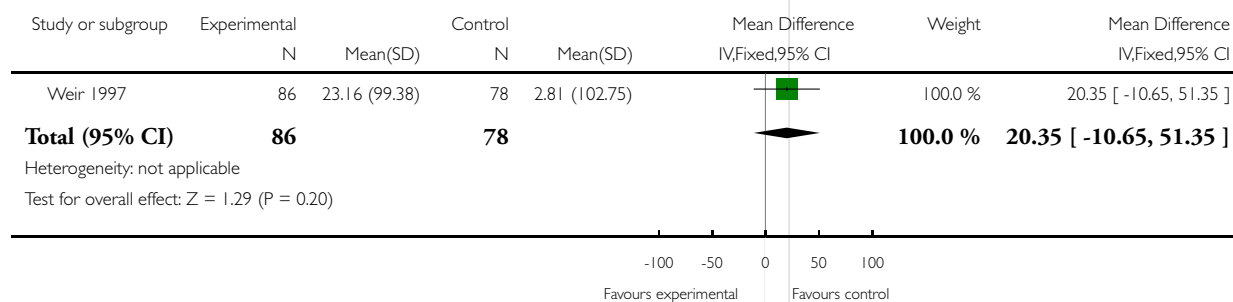


Analysis 4.1. Comparison 4 Management intervention vs no intervention, Outcome 1 Absence.

Review: Preventive staff-support interventions for health workers

Comparison: 4 Management intervention vs no intervention

Outcome: 1 Absence

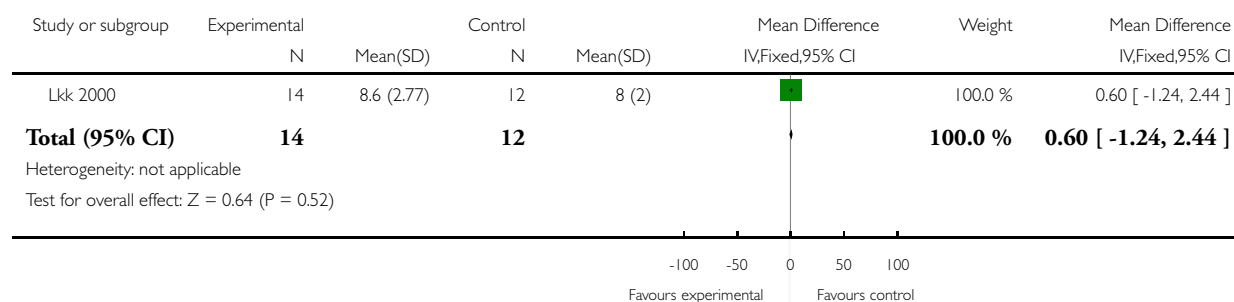


Analysis 4.2. Comparison 4 Management intervention vs no intervention, Outcome 2 Job stress.

Review: Preventive staff-support interventions for health workers

Comparison: 4 Management intervention vs no intervention

Outcome: 2 Job stress

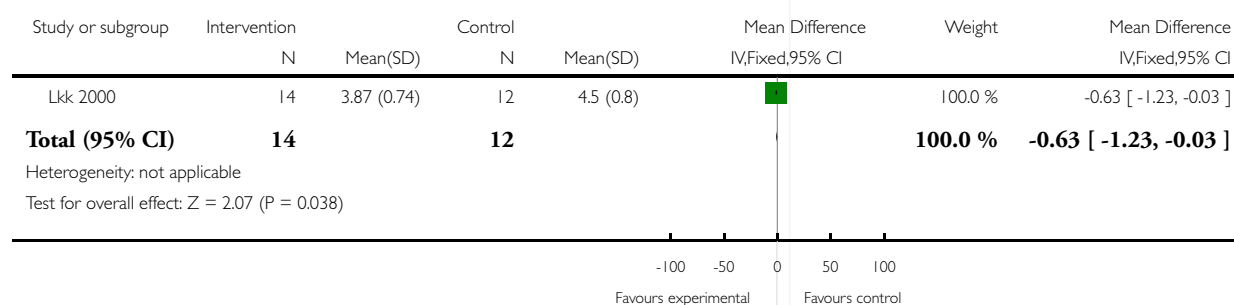


Analysis 4.3. Comparison 4 Management intervention vs no intervention, Outcome 3 Job satisfaction.

Review: Preventive staff-support interventions for health workers

Comparison: 4 Management intervention vs no intervention

Outcome: 3 Job satisfaction

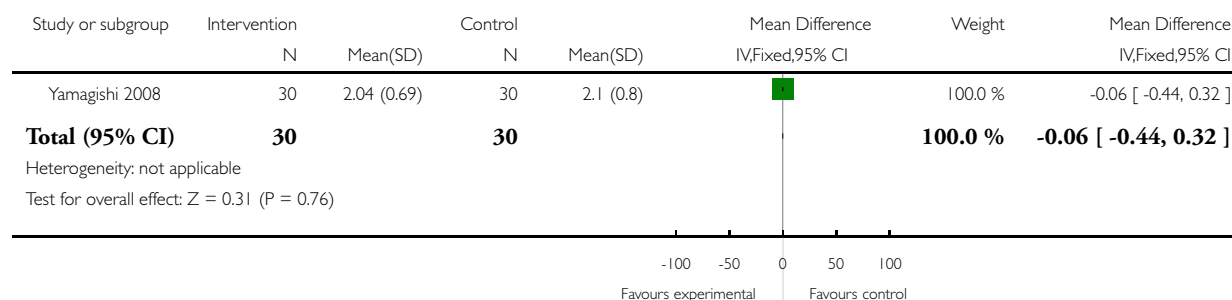


Analysis 5.1. Comparison 5 Career identity training vs no intervention, Outcome 1 Job stress.

Review: Preventive staff-support interventions for health workers

Comparison: 5 Career identity training vs no intervention

Outcome: 1 Job stress



APPENDICES

Appendix I. SEARCH STRATEGIES

The Cochrane Effective Practice and Organisation of Care Group (EPOC) Specialised Register

Individual searches for the following terms/phrases were searched in Title, in Abstract and in Keywords

Staff support
Employee support
Clinician support
Nurse support
Peer support
Personnel support
Physician support
Communication skills
Coping skills
Work related stress
Occupational stress
Burnout
Absenteeism
Turnover
Job satisfaction

Also, individual searches for the following combined terms/phrases were searched in Title and in Abstract (% indicates truncation)

Social support and staff
Social support and personnel
Social support and employee%

Social support and nurse%
Social support and clinician%
Social support and physician%

The Cochrane Central Register of Controlled Trials

- #1 MeSH descriptor Health Personnel explode all trees
- #2 (health or healthcare or health NEXT care) NEAR/2 (personnel or worker* or staff or professional*):ti or (health or healthcare or health NEXT care) NEAR/2 (personnel or worker* or staff or professional*):ab
- #3 (medical NEAR/2 (personnel or staff or professional* or worker*)):ti or (medical NEAR/2 (personnel or staff or professional* or worker*)):ab
- #4 (nurs* NEAR/2 (personnel or staff or professional* or worker*)):ti or (nurs* NEAR/2 (personnel or staff or professional* or worker*)):ab
- #5 MeSH descriptor Stress, Psychological, this term only
- #6 MeSH descriptor Burnout, Professional, this term only
- #7 MeSH descriptor Stress Disorders, Post-Traumatic, this term only
- #8 MeSH descriptor Occupational Health, this term only
- #9 MeSH descriptor Occupational Health Nursing, this term only
- #10 MeSH descriptor Occupational Health Services, this term only
- #11 MeSH descriptor Occupational Medicine, this term only
- #12 MeSH descriptor Psychology, Industrial, this term only
- #13 MeSH descriptor Absenteeism, this term only
- #14 MeSH descriptor Job Satisfaction, this term only
- #15 MeSH descriptor Social Support, this term only
- #16 MeSH descriptor Motivation, this term only
- #17 MeSH descriptor Feedback, Psychological, this term only
- #18 MeSH descriptor Personnel Turnover explode all trees
- #19 MeSH descriptor Workload, this term only
- #20 MeSH descriptor Workplace, this term only
- #21 MeSH descriptor Adaptation, Psychological, this term only
- #22 MeSH descriptor Employee Incentive Plans, this term only
- #23 (staff or employee* or social) NEAR/2 (support*):ti or (staff or employee* or social) NEAR/2 (support*):ab
- #24 (morale):ti or (morale):ab
- #25 (job or work) NEAR/2 satisfaction:ti or (job or work) NEAR/2 satisfaction:ab
- #26 (burnout):ti or (burnout):ab
- #27 (work or job) NEAR/2 stress:ti or (work or job) NEAR/2 stress:ab
- #28 (absenteeism or (work NEXT absence) or (job NEXT absence)):ti or (absenteeism or (work NEXT absence) or (job NEXT absence)):ab
- #29 (staff or doctor* or nurse* or personnel or employee*) NEAR/2 (turnover or (turn NEXT over)):ti or (staff or doctor* or nurse* or personnel or employee*) NEAR/2 (turnover or (turn NEXT over)):ab
- #30 (work NEXT related):ti or (work NEXT related):ab
- #31 (coping NEAR (strateg* or skill*)):ti or (coping NEAR (strateg* or skill*)):ab
- #32 (incentive* NEAR (program* or plan*)):ti or (incentive* NEAR (program* or plan*)):ab
- #33 (#1 OR #2 OR #3 OR #4)
- #34 (#5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32)
- #35 (#33 AND #34)

MEDLINE

1. exp Health Personnel/
2. ((health or healthcare or health care) adj2 (personnel or worker? or staff or professional?)).tw.
3. (medical adj2 (personnel or staff or professional? or worker?)).tw.
4. (nurs\$ adj2 (personnel or staff or professional? or worker?)).tw.
5. or/1-4

6. Stress, Psychological/
7. Burnout, Professional/
8. Stress Disorders, Post-Traumatic/
9. Occupational Health/
10. Occupational Health Nursing/
11. Occupational Health Services/
12. Occupational Medicine/
13. Psychology, Industrial/
14. Absenteeism/
15. Job Satisfaction/
16. Social Support/
17. Motivation/
18. Feedback, Psychological/
19. Personnel Turnover/
20. Workload/
21. Workplace/
22. Adaptation, Psychological/
23. Employee Incentive Plans/
24. ((staff or employee? or social) adj2 support\$).tw.
25. morale.tw.
26. ((job or work) adj2 satisfaction).tw.
27. burnout.tw.
28. ((work or job) adj2 stress).tw.
29. (absenteeism or work absence or job absence).tw.
30. ((staff or doctor? or nurse? or personnel or employee?) adj2 (turnover or turn over)).tw.
31. work related.tw.
32. (coping adj (strateg\$ or skill?)).tw.
33. (incentive? adj (program\$ or plan?)).tw.
34. or/6-33
35. clinical trial.pt.
36. randomized controlled trial.pt.
37. controlled clinical trial.pt.
38. randomized.ti,ab.
39. placebo.ti,ab.
40. dt.fs.
41. randomly.ti,ab.
42. trial.ti,ab.
43. groups.ti,ab.
44. or/35-43
45. Animals/
46. Humans/
47. 45 not (45 and 46)
48. 44 not 47
49. 5 and 34 and 48
50. letter.pt.
51. editorial.pt.
52. comment.pt.
53. or/50-52
54. 49 not 53

EMBASE

1. exp Health Care Personnel/
2. ((health or healthcare or health care) adj2 (personnel or worker? or staff or professional?)).tw.

3. (medical adj2 (personnel or staff or professional? or worker?)).tw.
4. (nurs\$ adj2 (personnel or staff or professional? or worker?)).tw.
5. or/1-4
6. Mental Stress/
7. Job Stress/
8. Burnout/
9. Posttraumatic Stress Disorder/
10. Occupational Health/
11. Occupational Health Nursing/
12. Occupational Psychology/
13. Occupational Medicine/
14. Absenteeism/
15. Job Satisfaction/
16. Social Support/
17. Motivation/
18. Positive Feedback/
19. Negative Feedback/
20. Workload/
21. Workplace/
22. Coping Behavior/
23. Quality of Working Life/
24. ((staff or employee? or social) adj2 support\$).tw.
25. morale.tw.
26. ((job or work) adj2 satisfaction).tw.
27. burnout.tw.
28. ((work or job) adj2 stress).tw.
29. (absenteeism or work absence or job absence).tw.
30. ((staff or doctor? or nurse? or personnel or employee?) adj2 (turnover or turn over)).tw.
31. work related.tw.
32. (coping adj (strateg\$ or skill?)).tw.
33. (incentive? adj (program\$ or plan?)).tw.
34. or/6-33
35. 5 and 34
36. exp Clinical Study/
37. ((controlled or clinical) adj study).tw.
38. trial.tw.
39. groups.tw.
40. random\$.mp.
41. or/36-40
42. 35 and 41
43. Human/
44. Nonhuman/
45. Animal/
46. or/43-45
47. 46 not (43 and 46)
48. 42 not 47

CINAHL

1. exp Health Personnel/
2. ((health or healthcare or health care) adj2 (personnel or worker? or staff or professional?)).tw.
3. (medical adj2 (personnel or staff or professional? or worker?)).tw.
4. (nurs\$ adj2 (personnel or staff or professional? or worker?)).tw.
5. or/1-4

6. Stress, Psychological/
7. Stress Occupational/
8. Burnout, Professional/
9. Stress Disorders, Post-Traumatic/
10. Occupational Health/
11. Occupational Health Nursing/
12. Psychology, Occupational/
13. Absenteeism/
14. Adaptation, Occupational/
15. Job Satisfaction/
16. Professional Recognition/
17. Support, Psychosocial/
18. Motivation/
19. Feedback/
20. Personnel Turnover/
21. Workload/
22. Coping/
23. Employee Incentive Programs/
24. Quality of Working Life/
25. ((staff or employee? or social) adj2 support\$).tw.
26. morale.tw.
27. ((job or work) adj2 satisfaction).tw.
28. burnout.tw.
29. ((work or job) adj2 stress).tw.
30. (absenteeism or work absence or job absence).tw.
31. ((staff or doctor? or nurse? or personnel or employee?) adj2 (turnover or turn over)).tw.
32. work related.tw.
33. (coping adj (strateg\$ or skill?)).tw.
34. (incentive? adj (program\$ or plan?)).tw.
35. or/6-34
36. 5 and 35
37. exp Clinical Trials/
38. clinical trial.pt.
39. ((controlled or clinical) adj study).tw.
40. trial.tw.
41. groups.tw.
42. random\$.mp.
43. or/37-42
44. 36 and 43

PsycINFO

1. exp Health Personnel/
2. ((health or healthcare or health care) adj2 (personnel or worker? or staff or professional?)).tw.
3. (medical adj2 (personnel or staff or professional? or worker?)).tw.
4. (nurs\$ adj2 (personnel or staff or professional? or worker?)).tw.
5. or/1-4
6. Psychological Stress/
7. Occupational Stress/
8. Posttraumatic Stress Disorder/
9. Social Support/
10. Employee Motivation/
11. Professional Recognition/
12. Employee Turnover/

13. Employee Absenteeism/
14. Job Satisfaction/
15. Working Conditions/
16. Work Load/
17. Coping Behavior/
18. Quality of Work Life/
19. Job Enrichment/
20. ((staff or employee? or social) adj2 support\$).tw.
21. morale.tw.
22. ((job or work) adj2 satisfaction).tw.
23. burnout.tw.
24. ((work or job) adj2 stress).tw.
25. (absenteeism or work absence or job absence).tw.
26. ((staff or doctor? or nurse? or personnel or employee?) adj2 (turnover or turn over)).tw.
27. work related.tw.
28. (coping adj (strateg\$ or skill?)).tw.
29. (incentive? adj (program\$ or plan?)).tw.
30. or/6-29
31. 5 and 30
32. Clinical Trials/
33. Methodology/
34. Empirical Methods/
35. Experimental Methods/
36. Experimental Design/
37. Experiment Controls/
38. Treatment Effectiveness Evaluation/
39. Treatment Outcome Clinical Trial.md.
40. random\$.mp.
41. ((controlled or clinical) adj study).tw.
42. trial.tw.
43. groups.tw.
44. or/32-43
45. 31 and 44

Sociological Abstracts

(KW=health professions or KW=health personnel or KW=healthcare personnel or KW=health care personnel or KW=medical personnel or KW=health worker? or KW=healthcare worker? or KW=health care worker? or KW=medical worker? or KW=health staff or KW=healthcare staff or KW=health care staff or KW=medical staff or KW=health professional? or KW=healthcare professional? or KW=health care professional? or KW=medical professional? or KW=nurse? or KW=physician? or KW=doctor?) **AND** (KW=occupational health or KW=occupational medicine or KW=support or KW= motivation or KW=morale or KW=turnover or KW=turn over or KW= coping or KW=job satisfaction or KW=work load or KW=workload or KW=stress or KW=burnout or KW=burn out or KW=absenteeism or KW=work related) **AND** (KW=randomi* or KW=random* allocate* or KW=random* assign* or KW=random* divid* or KW=random* trial or KW=random* study or KW=random* studies or KW=(control* or clinic* or prospective*) within 5 (trial* or study or studies) or KW=(allocate* or assign* or divid*) within 5 (condition* or experiment* or treatment* or control* or group*) or KW=singl* blind* or KW=singl* mask* or KW=doubl* blind* or KW=doubl* mask* or KW=crossover or KW=cross over or KW=placebo* or KW=(compare*) within 5 (trial* or study or studies))

HISTORY

Protocol first published: Issue 1, 2002

Review first published: Issue 3, 2010

31 July 2008	Amended	Converted to new review format.
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CONTRIBUTIONS OF AUTHORS

BVW wrote the protocol, with contributions from VP. All authors assessed studies for inclusion; participated in data extraction; and contributed to data analysis. BVW drafted the study report and VP commented.

DECLARATIONS OF INTEREST

None known.

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- Medical Research Council, South Africa.
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DIFFERENCES BETWEEN PROTOCOL AND REVIEW

No changes.