National Institute for Health and Care Excellence

Draft for Consultation

# Mental wellbeing at work

## Evidence review E: Targeted individual-level approaches

*NICE guideline <number>*

*Evidence reviews underpinning recommendations 1.2.1 – 1.2.2, 1.7.1 – 1.7.5, 1.11.1 and research recommendations in the NICE guideline*

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# Contents

**1 Targeted individual-level approaches to prevent, improve, promote mental wellbeing at work ..... 5**

1.1 Review question ..... 5

1.1.1 Introduction ..... 5

1.1.2 Summary of the protocol ..... 5

1.1.3 Methods and process ..... 7

1.1.4 Evidence ..... 7

1.1.5 Summary of studies included in the effectiveness evidence ..... 8

1.1.6 Summary of studies included in the qualitative evidence ..... 35

1.1.7 Economic evidence ..... 36

1.1.8 Summary of included economic evidence ..... 37

1.1.9 Economic model ..... 45

1.1.10 Summary of the quality of the effectiveness evidence, certainty of the qualitative evidence and economic evidence statements ..... 45

1.1.11 The committee's discussion and interpretation of the evidence ..... 70

1.1.12 Recommendations supported by this evidence review ..... 75

1.1.13 References – included studies ..... 76

**Appendices ..... 80**

**Appendix A – Review protocols ..... 80**

**Appendix B – Literature search strategies ..... 97**

**Appendix C – Effectiveness evidence study selection ..... 102**

**Appendix D – Effectiveness evidence ..... 103**

**Appendix E – Forest plots ..... 489**

**Appendix F – GRADE and/or GRADE-CERQual tables ..... 516**

**Appendix G – Economic evidence study selection ..... 540**

**Appendix H - Economic evidence tables ..... 541**

**Appendix I – Health economic model ..... 555**

**Appendix J – Excluded studies ..... 556**

**Appendix K – Research recommendations – full details ..... 574**

# 1 Targeted individual-level approaches to prevent, improve, promote mental wellbeing at work

## 1.1 Review question

RQ5.1 What individual-level interventions targeted to employees who experience, or are identified as being at risk of, poor mental wellbeing at work are effective and cost effective for:

- promoting positive mental wellbeing?
- improving mental wellbeing?
- preventing poor mental wellbeing?

RQ5.2 For the following groups in relation to individual-level targeted interventions, what are their views and experiences of what and why certain approaches may or may not work, and how it could be improved:

- those receiving them.
- employers.
- those delivering them.

### 1.1.1 Introduction

The proportion of UK employees who are part-time, temporary, agency staff, on zero hours contracts or self-employed has increased since PH22 was published in 2009. The Stevenson/Farmer review 'Thriving at work' estimates that 15% of UK workers have an existing mental health condition. Better mental wellbeing and job satisfaction are associated with increased workplace performance and productivity (Department for Business Innovation & Skills 2014). However, many employers know the value of positive mental wellbeing but do not know how to promote it.

Therefore, the objective of this review is to identify targeted interventions at individual level for employees who are experiencing or who are identified as being at risk of poor mental wellbeing at work that are effective and cost-effective at:

- Preventing poor mental wellbeing
- Promoting positive mental wellbeing
- Improving mental wellbeing

Additionally, the review aims to determine the acceptability of these interventions for those receiving them, employers, and those delivering the interventions as well as any barriers and facilitators.

### 1.1.2 Summary of the protocol

**Table 1**: **PICO for targeted individual- level approaches**

| | |
|---|---|
| **Population** | **Quantitative and Qualitative**<br>Employees who:<br>• are experiencing poor mental wellbeing (self-identified or identified using objective measures and/ or validated self-report measures) |

| | |
|---|---|
| | • have been identified as being at risk of experiencing poor mental wellbeing (due to factors at work or outside of work)<br>**Qualitative**<br>Employers, managers<br>Those delivering the interventions |
| **Intervention** | **Quantitative and Qualitative**<br>Individual-level approaches delivered to a selected population in addition to usual practice that aims to (one or more of):<br>• improve mental wellbeing<br>• promote positive mental wellbeing<br>• prevent poor mental wellbeing |
| **Comparator** | **Quantitative**<br>Usual practice (this may be called a control group or waiting list control group or other terms in the individual studies)<br><br>**Qualitative**<br>Not applicable |
| **Outcomes** | **Quantitative**<br>Employee outcomes<br>• Any measure of mental wellbeing (using objective measures and/ or validated self-report measures)<br>• Job stress, burnout or fatigue (using objective measures and/ or validated self-report measures)<br>• Symptoms of mental health conditions such as depression, anxiety, insomnia (using validated self-report measures)<br>• Absenteeism<br>• Presenteeism<br>• Productivity<br>• Job satisfaction, engagement or motivation<br>• Quality of life<br>• Uptake of support services<br><br>Employer outcomes<br>• Productivity<br>• Absenteeism<br>• Presenteeism<br>**Qualitative**<br>Eligible studies will include as outcomes the views and experiences of:<br>• Employees receiving the interventions<br>• Employers<br>Those delivering the interventions |

### 1.1.3 Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in Appendix A.

**Timepoints**

We considered outcomes at any follow up. Priority was given to the longest follow up time for an outcome. Other timepoints, including baseline data were reported in the evidence table for information only.

**Outcomes**

Where data were reported on the same outcome construct (as defined in the protocol), for example, job stress, burnout or fatigue, these were all pooled into a single outcome for the analyses.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

### 1.1.4 Evidence identified

#### 1.1.4.1 Included studies

In total 72,259 references were identified through systematic guideline-wide searches. Of these, 20,186 were screened at title and abstract using priority screening, and 1,416 were included for the whole guideline. Of these, 213 references were considered relevant to this review based on title and abstract screening and were ordered. After the full text screening of these references, 46 papers were eligible for inclusion in the systematic review and 167 were excluded.

A total of 38 studies (reported in 46 papers) were included in this review. Of these studies, 35 were randomised controlled trials, 2 were non-randomised studies, and 1 was a qualitative study. The characteristics of the 38 included studies are presented in Table 2 and a brief summary of the interventions presented in Table 3. See Appendix C for PRISMA diagram and Appendix D for full evidence tables.

#### 1.1.4.2 Excluded studies

167 studies did not meet the inclusion criteria and therefore excluded from the review. See Appendix J for full reasons of exclusion.

### 1.1.5 Summary of studies included in the effectiveness evidence

**Table 2: Summary of studies**

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| Bergdahl 2005 [Sweden] | RCT | • Public sector<br>• Industry - Social services / education<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified | A high stress level at both the initial screening and the testing six months later, prior the intervention. | Increase affect awareness, and the ability to perceive and express affects in order to improve the ability to cope with stress | No intervention | • Job stress<br>• Mental health symptoms |
| Birney 2016 [USA] | RCT | • Sector - Not specified<br>• Industry - Not specified<br>• Size - Not specified<br>• Contract - Mixed (Full-time, part-time, self-employed)<br>• Seniority - Not specified | Adults with mild-moderate depression | Mobile web CBT-based app | E-mail with links to vetted online information about depression | • Mental health symptoms<br>• Job stress<br>• Productivity<br>• Absenteeism<br>• Presenteeism<br>• Engagement<br>• Quality of life |
| Bostock 2016 [UK] | RCT | • Private sector<br>• Industry not specified<br>• Large organisation<br>• Full-time contracts<br>• Seniority - not reported<br>• Office based | Self-identifies as having poor sleep with reliable internet access, able to read and understand English | Digital CBT | No intervention | • Mental health symptoms<br>• Absenteeism<br>• Presenteeism<br>• Not reported |
| Brinkborg 2011 [Sweden] | RCT | • Public sector<br>• Social care industry<br>• Large organisation<br>• Contract type - Not specified | Social workers | Acceptance and Commitment Therapy stress management intervention therapy (ACT-SMI) | No intervention | • Job stress<br>• Mental wellbeing<br>• Job satisfaction |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | • Seniority - Not specified | | | | |
| Carolan 2017 [UK] | RCT | • Sector - Not specified<br>• Industry - Not specified<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Mix of senior managers / administrators, professionals, technical / craft, clerical / intermediate occupations | Employed participants with an elevated level of stress score of ≥20 on the PSS-10 | CBT based digital mental health program (WorkGuru) with and without discussion group | No intervention | • Symptoms of mental health conditions<br>• Job motivation<br><br>Qualitative outcomes<br>• Acceptability<br>• Barriers<br>• Facilitators |
| Clemow 2018 [USA] | RCT | • Sector: Not reported<br>• Industry: Healthcare<br>• Organisation size: Large<br>• Contract type: Not reported<br>• Seniority: Not reported<br>• Income: Mixed | Employees with average BP greater than or equal to 140 mm Hg SBP or 90 mm Hg diastolic BP whose average readings did not exceed 180/110 mm Hg | Stress management | Minimally-enhanced usual care | • Job stress<br>• Mental health symptoms |
| De Zeeuw 2010 [The Netherlands] | RCT | • Sector: Private<br>• Industry: Insurance<br>• Organisation size: Large<br>• Contract type: Not reported<br>• Seniority: Not reported<br>• Income: White-collar workers | Employees with minimal symptoms of depression as scored by PHQ-9 | Exercise | Control | • Mental health symptoms<br>• Absenteeism |
| Diaz-Silveira 2020 [Spain] | RCT (3 armed trial) | • Sector: Private<br>• Industry: Telecommunications | Team leaders with medium levels of perceived stress | Mindfulness-based stress management | Wait list | • Job stress<br>• Mental health symptoms |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | • Organisation size: Large<br>• Contract type: Permanent<br>• Seniority: Team leaders<br>• Income: Mostly university educated | according to the PSS | Exercise | | |
| Duiits 2008 [The Netherlands] | RCT | • Sector - Not specified<br>• Mix of healthcare and educational<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees identified as being 'at risk' of sickness absence for psychosocial health reasons | Preventative coaching | Usual care | • Mental wellbeing<br>• Job stress<br>• Mental health symptoms<br>• Quality of life<br>• Absenteeism |
| Ebert 2015 [Germany] | RCT | • Sector - Not specified<br>• Educational<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Teachers experiencing insomnia symptoms and low levels of psychological detachment from work, not receiving psychological help for their sleep problems | Internet based recovery training | No intervention | • Mental wellbeing<br>• Job stress<br>• Symptoms of mental health conditions |
| Ebert 2014 [Germany] | RCT | • Sector - Not specified<br>• Educational<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Teachers with a heightened level of depressive symptoms, a score of ≥16 on the Center for Epidemiologic Studies Depression Scale (CES-D), have no notable suicidal risk as indicated by a score of <2 on item 9 of | Internet based problem- solving training | Usual care | • Symptoms of mental health conditions<br>• Job stress,<br>• Mental wellbeing<br>• Job satisfaction<br>• Quality of life<br>• Absenteeism |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | | the Beck Depression Inventory (BDI) (2="I'd like to kill myself", 3="I'd kill myself if I had a chance"). | | | |
| Ebert 2016 a [Germany] | RCT | • Sector - Not specified<br>• Industry - Mix including health, economy, service, IT, social and other<br>• Size - Mix though small and medium sized companies were targeted<br>• Contract type - Mix of full- and part- time<br>• Seniority - Not specified | Employees with scores ≥22 on the Perceived Stress Scale (PSS-10) | internet-based stress management intervention | Waiting list | • Job stress<br>• Symptoms of mental health conditions<br>• Quality of life<br>• Mental health literacy<br>• Job engagement<br>• Absenteeism<br>• Presenteeism |
| Ebert 2016 b [Germany] | RCT | • Private Sector<br>• Health insurance company<br>• Size - Large<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees with scores ≥22 on the Perceived Stress Scale (PSS-10) | Internet and mobile-base stress management intervention | Usual care | • Job stress<br>• Symptoms of mental health conditions<br>• Mental health literacy<br>• Job engagement<br>• Absenteeism<br>• Presenteeism |
| Furukawa 2012 [Japan] | RCT | • Private Sector<br>• Manufacturing company<br>• Size - Large<br>• Contract type - Not specified<br>• Seniority - Not specified | • Aged 20–57<br>• Male and female employees<br>• Currently employed full-time (including temporary staff) | Telephone based CBT | Usual care | • Mental health symptoms<br>• Presenteeism |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | | • Expected to be employed full-time for 6 months after screening<br>• Scored 9 or greater on the K6 tool at screening (a 6 item self-report screening tool for common mental disorders)<br>• Scored 10 or more on the BDI2 tool at screening (Beck Depression Inventory II) | | | |
| Geraedts 2014 [The Netherlands] | RCT | • Private and Public Sector<br>• banking companies, research institutes, security company, university<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees with elevated depressive symptoms by a score of 16 or higher on the Center for Epidemiologic Studies Depression scale and not on sick leave | Web guided self help | Usual care | • Job stress<br>• Mental health symptoms<br>• Uptake of support services<br>• Absenteeism |
| Grime 2004 [UK] | RCT | • Public Sector<br>• NHS occupational health department<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees who had 10 or more cumulative days of sickness absence due to stress, anxiety or depression in last 6 months and scored 4 or more on GHQ-12 | Computerised CBT programme 'Beating the blues' plus usual care | Usual care | • Symptoms of mental health conditions<br>• Mental wellbeing<br>• |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| Guo 2020 [China] | RCT | • Sector: Public<br>• Industry: Healthcare<br>• Organisation size: Large<br>• Contract: Full time<br>• Seniority: Not reported<br>• Income: Professional (nurses) | Nurses who scored higher than 1.5 on the MBI-GS | Positive psychotherapy | Control | • Mental wellbeing |
| Heber 2016 [Germany] | RCT | • Sector not specified<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees scoring 22 or above on the Perceived Stress Scale 10 | Web and mobile based stress management training programme | Usual care | • Job stress<br>• Symptoms of mental health conditions<br>• Quality of life<br>• Job satisfaction<br>• Absenteeism<br>• Presenteeism<br>• Mental health literacy |
| Jones 2000 [UK] | RCT | • Public Sector<br>• Healthcare industry<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Student nurses experiencing significant levels of distress during hospital placements | Stress management training | No intervention (told that they would be offered a version of the intervention in a second run of the programme) | • Mental health symptoms<br>• Absenteeism |
| Kawakami 1999 [Japan] | RCT | • Private sector<br>• Manufacturing industry<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees with psychological distress, with GHQ score of 3 or greater | Advice via mail | No intervention | • Job stress<br>• Absenteeism |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| Kim 2013 [USA] | RCT | • Public sector<br>• Healthcare industry<br>• Size – Large<br>• Contract type - Not specified<br>• Seniority - Not specified | Employed nurses, Score at least 28 on PTSD Checklist–Civilian version (PCL-C) and a score of 3 or higher on at least 1 item | Mindfulness-based stretching and deep breathing | No intervention | • Job stress |
| Kurebayashi 2014 [Brazil] | RCT | • Private sector (private hospital)<br>• Healthcare industry<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employed nurses with medium or high levels of stress from Stress Symptom List | Auriculotherapy(Chinese holistic therapy) with and without a protocol | No intervention | • Job stress |
| Lacerda 2018 [Brazil] | RCT | • Sector- not specified<br>• Industrial industry<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees who had stress complaints and at least 8 years of education | Mindfulness intervention (PROGRESS) | No intervention (received intervention after intervention group) | • Mental wellbeing<br>• Mental health symptoms |
| Lexis 2011 [The Netherlands] | RCT | • Sector- Private<br>• Banking industry<br>• Size – Large<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees who were at risk of sickness absence and with mild to severe depressive complaints | CBT and problem solving therapy | Usual care | • Mental health symptoms<br>• Absenteeism |
| Lindquist 1999 [Australia] | RCT | • Sector- Public<br>• government tax office<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Office workers identified as having high levels of perceived stress, unhealthy lifestyle behaviours and poor coping skills | Problem solving skills training and counselling | Usual care (offered the intervention at the end of the assessment period) | • Job stress |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| Loft 2013 [New Zealand] | RCT | • Sector: Private<br>• Industry: Not reported<br>• Organisation size: Mixed (10 large and 1 small)<br>• Contract type: Full time<br>• Seniority: Mixed<br>• Income: Mixed | Participants with a score of 4 or greater on the PSQI, which indicates at least moderate difficulties in two or more areas | Imagery tasks | Neutral imagery | • Mental health symptoms |
| Macias 2019 [Spain] | RCT | • Public sector<br>• City council<br>• Size – Large<br>• Contract type - Not specified<br>• Seniority - Not specified but all work with monotonous and repetitive tasks | Employees with ≥ 12 and Maslach Burnout Inventory General-Survey (MBI-GS, exhaustion scale). ≥ 10 | Functional Analytic Psychotherapy (FAP) and Acceptance and Commitment Therapy (ACT) | No intervention | • Mental wellbeing<br>• Job stress<br>• Mental health symptoms<br>• Engagement |
| Nhiwatiwa 2003 [UK] | RCT | • Public Sector<br>• Healthcare industry (hospital)<br>• Size – Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified | Nurses who had been assaulted by patient(s) at work | Brief educational intervention (reading a booklet on effects of trauma and coping) | Outcome questionnaires | • Mental wellbeing<br>• Symptoms of mental health |
| Philips 2014 [UK] | RCT | • Sector-Not specified<br>• Healthcare, transport and communication sectors<br>• Size – Large<br>• Contract type - Not specified<br>• Seniority - Not specified | Employees who scored 2 or more on 5 of the 9 items on Patient Health Questionnaire-9, and at least one of the items identified made it difficult to work, take care of things at home or | Computerised CBT (MoodGYM) | 'Attentional' control-5 websites with general information about mental health | • Symptoms of mental health conditions |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | | get along with other people | | | |
| Prado 2018 [Brazil] | RCT | • Public sector<br>• Healthcare industry (charity Hospital)<br>• Large organisation<br>• Contract type - not reported<br>• Seniority – Mixed | Nurses with medium and high stress level (40-110 points on List of Stress Symptoms) | Auriculotherapy (experimental) | • Placebo auriculotherapy with sham points<br>• Control with no intervention | • Job stress<br>• Symptoms of mental health conditions |
| Rajeswari 2019 [India] | RCT | • Sector: Public<br>• Industry: Healthcare<br>• Organisation size: Large<br>• Contract type: Not reported<br>• Seniority: Not reported<br>• Income: Professional (nurses) | Nurses who scored more than 30 in Index of Clinical Stress | Accelerated Recovery Programme | • Control | • Job stress |
| Seo 2020 [South Korea] | RCT | • Sector: Not reported<br>• Industry: Not reported<br>• Organisation size: Not reported<br>• Contract type: Not reported<br>• Seniority: Not reported<br>• Income: Not reported (office workers) | Stressed office workers with 9 points or more on a Psychological Wellbeing Index – Short Form scale | Swedish massage | • Resting group | • Mental health symptoms |
| Taimela 2008 – high risk [Finland] | RCT | • Sector: Private<br>• Industry: Construction<br>• Organisation size: Large<br>• Contract type: Not reported<br>• Seniority: Not reported | Employees showing either impairment due to musculoskeletal problems at work, potential depression, | Occupational health consultation | Usual care | • Absenteeism |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | • Income: 62% were blue-collar workers | distress, fatigue, sleep disturbances or uncertain future working ability | | | |
| Taimela 2008 –intermediate risk [Finland] | RCT | • Sector: Private<br>• Industry: Construction<br>• Organisation size: Large<br>• Contract type: Not reported<br>• Seniority: Not reported<br>• Income: 62% were blue-collar workers | Employees showing either impairment due to musculoskeletal problems, pain, weight problems, excess alcohol consumption, mood disturbances, sleep disturbances, daytime sleepiness, suspicion of sleep apnoea or insufficient sleep. | Medical counselling | Usual care | • Absenteeism |
| Tarquini 2016 [Italy] | NRCT | • Sector- Not specified<br>• 2 tourist information centres<br>• Size- Not specified<br>• Contract type - not reported<br>• Seniority – Not specified | Non-manager employees | Expressive writing (Pennebakers writing technique) | No intervention | • Mental wellbeing<br>• Job stress<br>• Symptoms of mental health conditions |
| Tsang 2015 [Hong Kong] | NRCT | • Sector- Public<br>• Education industry (school)<br>• Size- large (14 schools)<br>• Contract type - not reported<br>• Seniority – teachers and teaching assistants | Qualified teaching staff with mild to severe depression, anxiety and stress symptoms (score at least 8 on depression and anxiety subscales and 14 on the stress subscales of the Depression, | CBT plus complementary and alternative medicine | No intervention | • Mental wellbeing<br>• Symptoms of mental health conditions<br>• Job satisfaction |

| Study (Country) | Study design | Setting | Population | Intervention | Comparator | Outcome |
|---|---|---|---|---|---|---|
| | | | Anxiety and Stress Scales) | | | |
| Yang 2018 [China] | RCT | • Public sector<br>• Healthcare industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified | Psychiatric nurses who had more than 1 year of work experience, were engaged in psychiatric clinical work and screened positively for more than 30 items on Symptom Checklist 90 (SCL-90) | Mindfulness-based stress reduction therapy | Usual care | • Mental wellbeing<br>• Mental health symptoms |
| Zolnierczyk-Zreda 2016 [Poland] | RCT | • Private Sector - Mix of financial and service sector companies including banking, advertising and insurance companies.<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Middle-manager | • Employed as a middle manager currently,<br>• Over 26 years of age<br>• Had been in the same job for at least 2 years<br>• Responded to the question 'How often do you feel stressed?' with a frequency of at least 'regularly'<br>• Agreed to participate in the whole programme | Mindfulness-based stress reduction | No intervention | • Mental wellbeing<br>• Absenteeism<br>• Mental health symptoms |

**Table 3: Summary of intervention characteristics**

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| Affect School | Bergdahl 2005 | The goal is to increase affect awareness, and the ability to perceive and express affects. It is based on Tomkins affect theory | Manual, handouts, didactic presentations | Each session consisted of three parts: a general topic, a specific affect and a group discussion of a specific affect. Handouts and exercise were used. | Each group was led by two psychologists | Group sessions | Seven 2-hours sessions over 7 weeks |
| MoodHacker | Birney 2016 | Based on cognitive-behavioural therapy principles | Online application | Content is sequenced to follow the enhanced CWD approach and delivered through daily emails, in-app messaging, and in the Articles & Videos library. | ORCAS, a health innovation and technology company | Online | 6 weeks |
| Digital CBT | Bostock 2016 | Based on cognitive behavioural therapy | Digital programme and app | dCBT was delivered using an established program with content based on validated CBT manuals is presented by an animated virtual therapist and tailored by the program's algorithms. | Animated therapist | Online | 6 sessions over 8 weeks |
| Acceptance and Commitment Therapy stress management intervention therapy (ACT-SMI) | Brinkborg 2011 | ACT-SMI focuses on acceptance of unpleasant internal events rather than on changing or eliminating stressors that give rise to such events | Treatment protocol, exercises, homework assignments and daily practice between sessions | Each session has a specific theme and follows the same structure.<br>Between sessions, the participants complete homework assignments, including physical exercise and mindfulness practice. | Four therapists (2 licensed psychologists and 2 master level students in psychology) working in pairs. | Not reported | 4 sessions of 3 hours each, provided every other week |
| Online CBT with or without | Carolan 2017 | The programme was based on the psychological | Online module, self-monitoring questionnaires, | Each core module had a specific focus. Modules consisted of a combination of | University of Sussex and Sussex | Online | 8 weeks. Participating organisations |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| discussion group support | | principles of CBT, positive psychology, mindfulness and problem solving. | Motivational emails on request. Bulletin board was available to the discussion group only. | reading, audio, brief animations and interactive exercises. | Partnership NHS Foundation Trust. | | were encouraged to allow staff a minimum of an hour a week to complete the modules. |
| Stress management programme | Clemow 2018 | The intervention is a structured cognitive-behavioural group intervention that draws on cognitive-behavioural techniques and stress reduction approaches. It is framed as training to increase a person's resiliency for coping with stressful situations, rather than as treatment for a mental disorder. | Videos that were integrated into sessions. | The facilitator lead participants through each of several behavioural skills. Skills included self-monitoring in response to stressful situations; problem solving; assertiveness in dealing with anger- and stress-inducing events and/or demands; deflection skills to reduce distress in stressful situations, such as breathing and muscle relaxation, distraction, and increasing distress tolerance; communication skills; and increasing empathy and building positive relationships. Facilitators offered individual consultation to participants who missed a session. | Three doctoral-level clinical or counselling psychologists | Group sessions of 8 to 10 participants | 10 weekly 1-hr sessions |
| Exercise programme | De Zeeuw 2010 | Studies have shown that exercise reduces depressive symptoms, at least in clinical populations. An additional benefit | Heart rate monitor that was used during the exercise programme | An individual training program was designed for each participant based on the results of the baseline physical fitness test. To encourage lifestyle daily physical activity, the instructor talked about the | Professional instructor | Groups of approximately 8 people. | Two sessions per week for 10 weeks. |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | of exercise is that it can improve fitness and work-related outcomes such as work attendance and job stress | | beneficial aspects of having a physically active lifestyle outside the exercise sessions, without giving direct advice on types and frequency of activities. Afterwards, participants received exercise and life-style advice. | | | |
| Mindfulness meditation | Diaz-Silveira 2020 | Mindfulness meditation (MM) is a practice based on Buddhist traditions, which develops full attention and awareness through sitting meditation. It has rapidly gained popularity in the Western world due to its accessibility and easy practice. | Participants were given instructions in writing and in audio format (mp3), so that they could practice meditation as a group. | The group met with the instructor on Mondays to explain the week's meditation. | Certified MBSR instructor | Group sessions | During the 5 working days of 5 consecutive weeks (15 minutes in week 1, 20 minutes in week 2, 25 minutes in week 3, 30 minutes in weeks 4 and 5) |
| Physical exercise | Diaz-Silveira 2020 | Physical exercise has been recognised for decades to maintain health, prevent illness and promote rehabilitation. | None reported | The group practiced aerobic exercise, which mainly consisted of running, training on an elliptical machine, rowing or cycling, outdoors or in the gym. Participants could choose the type of exercise they wanted to do and where to do it. Each group had a weekly meeting with its instructor who would | A certified instructor (bachelor's degree in physical activity and sports sciences) and experienced physical | Group | During the 5 working days of 5 consecutive weeks (15 minutes in week 1, 20 minutes in week 2, 25 minutes in week 3, 30 minutes in weeks 4 and 5) |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | | | introduce the weekly practice and clarify doubts. | activity trainer | | |
| Preventative coaching | Duiits 2008 | Preventive coaching focuses on enhancing wellbeing and performance and managing stress in employees who are not on sick leave and whose problems are relatively mild | Coaching protocol and checklists detailing the main features of each session and the problems to be addressed | Included: an introductory interview between coach and employee; a 3 way session also involving the employee's supervisor in which a tailored plan was developed; individual meetings between employee and coach focusing on the main problem and preventative coaching to lead to behavioural change; a further 3 way meeting with the supervisor focusing on ongoing support to maintain the changes at work. | Coaches | Face to face | Seven sessions (timeframe not clear) |
| GET-ON Recovery | Ebert 2015 | Based on cognitive model of insomnia, "the attention-intention-effort pathway" and based on the principles of health behavior change specified in the Health Action Process Approach. | Online sleep recovery diary (also available as a hard copy) A technical support hotline via email/phone | Sessions included articles and exercises, video and audio clips and focused on specific topics, including: psychoeducation and sleep hygiene; stimulus control and sleep restriction; setting boundaries; metacognitive techniques; future planning. | Not reported | Online | Six 45 – 60 min sessions |
| Problem solving | Ebert 2014 | Intervention aims to increase problem-solving skills and facilitate successful problem solving. | Video introduction to each lesson and manual was used for feedback | Participants describe what really matters to them (e.g., values, lifegoals). They write down their worries and problems, which are then divided into 3 | Psychologist and trained master's-level psychology students | Online | Five lessons over 7 weeks |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | | | categories: unimportant, important but solvable, and unsolvable problems. For each of the 3 types of problems, a different strategy is developed to either solve or cope with the problem if it is unimportant or unsolvable. | | | |
| GET-ON Stress | Ebert 2016 a; Ebert 2016 b; Heber 2016 | Based on Lazarus' transactional model of stress and supportive accountability model | Manual, personalised written feedback, | Modules focused on topics including psychoeducation; problem solving; emotion regulation; planning for the future. Ebert 2016b included adherence focused guidance. Heber 2016 offered support via text to remind participants to use techniques during the day. | Occupational health managers | Online / mobile | 8 45-60 minute modules over 7 weeks |
| Telephone CBT | Furukawa 2012 | Based on cognitive behavioural therapy | Manual and activity pocketbook. Homework | Session topics included: psychoeducation of the CBT model; increasing pleasant experiences; identifying negative thoughts, distancing oneself from them and challenging them; reviewing skill and developing a self - care plan. | Master, doctorate or postdoctoral level clinical psychologists , nurses or social workers or nurses with at least 1 year of clinical experience | Telephone | 8 30 – 45 minute sessions over 8 weeks |
| Web-guided self-help | Geraedts 2014 | Based on problem-solving treatment and cognitive therapy | Lessons, assignments and homework | Each lesson has a different theme, but always follows the same structure: information about the theme, examples, and assignments. A new | Occupational social workers based in the company or, | Online | 8 weekly sessions with option of 1 extra session |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | | | lesson is started after receiving the feedback from the coach who provides written weekly support via the website. | master's level clinical psychology students | | |
| Beating the blues | Grime 2004 | Based on cognitive behavioural therapy | Exercises, progress reports, | 'Beating The Blues' was loaded onto a stand-alone computer in a private room in the Occupational Health Department. Confidentiality was maintained with passwords. The author reviewed the weekly progress reports, to monitor for adverse events such as suicidal thoughts. | Online | Online | 8 weekly sessions |
| WeChat-based 3GT-positive psychotherapy | Guo 2020 | Three Good Things is one of a family of positive psychotherapies developed as intentional interventions to cultivate positive cognition and enhance constructive behaviour. | WeChat app | Participants were required to record three good things that were impressive each day. | Online | Individual online | Participants were invited to implement the intervention 5 days per week over the next 6 months |
| Stress management | Jones 2000 | Transactional conceptualisation of the stress process targeted the situational stressors, cognitive appraisal and | Didactic presentations, standardised manual; handouts. | Brief didactic presentations on a specific coping skill; experiential learning; individual and group reflection on the application of the techniques; planning to apply the techniques to situations in real life e.g. | Not specified | Face to face group | Six 2 hour sessions |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | coping strategies of student nurses, and focused therapeutic approaches at both individual and interface levels. | | exams; relaxation session. Topics included self-monitoring; problem solving; situational reappraisal; time and self- management skills. | | | |
| Mailed advice | Kawakami 1999 | The intervention aims to reduce stress through provision of individualised information | Individualised information on A4 paper | Mailed advice for stress reduction was sent to each participant, under the name of an occupational physician of the factory. Advice covered topics such as taking exercise, eating breakfast, reducing alcohol intake. Relaxation techniques were also briefly introduced. | Occupational health physician | Mail | Not reported |
| Mindfulness stretching and deep breathing | Kim 2013 | The intervention aims to enhance emotional regulation and cognitive function. | None reported | Stretching and balancing movements combined with breathing and a focus on mindfulness. Over the duration of the course, the intensity of the exercises increased. | A trained instructor | Group sessions | 16 sessions of 60 minutes duration, held 'semi-weekly' over 8 weeks |
| Auriculotherapy | Kurebayashi 2014; Prado 2018 | The intervention aims to reduce stress | Semi-permanent needles, local anaesthetic, cotton, 70% ethyl alcohol, hypoallergenic tape. | Localization of the reactive points, cleaning of the pinna; semi-permanent needles applied and affixed with hypoallergenic tape. In the 'protocol' group the Shen Men, Brainstem, Kidney, Liver, Liver Yang 1 and 2 points were used. In the 'without protocol' group, points were chosen depending on the symptoms | Six acupuncturist nurses and a acupuncturist psychologist. | Sessions conducted by a group of acupuncturists. | 12 session over 2 weeks - 2 sessions a week each lasting 5-10 minutes. |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | | | reported by participants at each session, according to traditional Chinese medicine. | | | |
| PROGRESS | Lacerda 2018 | Mindfulness based stress reduction programmes includes meditation, body awareness techniques and gentle movements to increase self-knowledge and resilience. | Printed handouts and CD's with material relevant to each session; weekly diary | 4 sessions developing self-awareness of the physical and psychological signs of stress; 2 sessions on putting training into practice; 2 sessions on developing more constructive and empathetic relationships with others. | Not reported | In person | 8 sessions over 2 months |
| CBT + problem solving therapy | Lexis 2011 | The intervention aims to use lifestyle and adaptive coping skills to reduce the subjective experience and aspects of stress. Based on cognitive behavioural therapy and problem solving principles | Treatment protocol; Workbooks for practical assignments | The 'basic' part of the intervention consisted of 7 sessions on the basic steps of Problem Solving Therapy. An optional 'specific' part consisted of up to 5 further sessions in which the participant could choose to focus on a particular aspect e.g. cognitive restructuring, if agreed necessary between participant and therapist. The principles of CBT were applied in all sessions. Homework was set at the end of each session. | 10 registered psychologists from a national company (Cenzo BV) | Not specified | 7 x 45 minute basic sessions, plus up to 5 further specific sessions if required. |
| Stress-management and coping skills training | Lindquist 1999 | To promote the use of lifestyle and adaptive coping skills to | None reported | Group workshops focused on stress and lifestyle education as well as stress- | Not reported | Face-to-face | Weekly workshops following by individual |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | reduce the subjective experience and aspects of stress. | | coping skills training. These were followed by individual counselling sessions focusing on an action plan that had been tailored based on the lifestyle and coping information obtained from the initial assessments. There were weekly phone calls to encourage plan maintenance. | | | counselling sessions of around 45 minutes duration. |
| Imagery tasks including implementation intentions, arousal reduction, and a combination of the two | Loft 2013 | Success in implementing sleep hygiene behaviours and getting quality sleep in turn promotes sleep self-efficacy, thereby fuelling a positive motivational and volitional self-regulation process | A set of laminated, written instructions of their imagery task as well as audiotaped recordings of the instructions. | During an initial group session, participants received training in their imagery tasks. They listened to audiotaped instructions for visualizing the intervention scenario. Participants were asked to complete the imagery tasks at the end of work and just prior to going to bed. | Not reported | Group training | 30 minute group activity and twice daily practice |
| Functional Analytic Psychotherapy and Acceptance and Commitment Therapy | Macias 2019 | To promote the use of lifestyle and adaptive coping skills to reduce the subjective experience and aspects of stress. | Home practice assignments related to the content of each session along with exercises and metaphors. | The core processes were: unworkable results of avoidance, acceptance of private experiences, promoting awareness, and the commitment to a meaningful life connected with the presence of distress. Sessions included: control of the problem and experiential avoidance, individual | Not reported | Individual face -to- face sessions | Three 90 minute sessions over five weeks. |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | | | functional analysis; encouraging awareness to deal with unpleasant events; preventing relapse, acceptance of stress. | | | |
| Brief educational intervention | Nhiwatiwa 2003 | Based on Functional Analytic Psychotherapy and Acceptance and Commitment Therapy. The integration of ACT and FAP to address complex and daily clinical problems is conceptualized as Functional – Analytic Acceptance and Commitment Therapy [ | An educational booklet on the effects of trauma and coping mechanisms. | Participants were sent an envelope, containing questionnaires, instructions on task sequence and the educational booklet in a sealed envelope with a warning not to open it until instructions have been read and understood. They had to complete both questionnaires and return them and could then open the sealed booklet and read it at their own pace. | Not reported | Self-help | Length of time to read the booklet was not reported. |
| Computerised CBT | Phillips 2014 | Based on cognitive behavioural therapy. | Website modules | All participants were required to give a telephone number as a condition of joining the study. Weekly telephone calls were made, lasting about 10 min on average, with three purposes: to maintain engagement with the study; to screen for risk; and to collect service use data for costing purposes | Telephone input was provided by the Mental Health Research Network's clinical studies officers | Online | Five 1 hour long modules, usually taken weekly. Weekly telephone calls were made, lasting about 10 min on average. |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| Accelerated recovery programme | Rajeswari 2019 | Accelerated Recovery programme (ARP) is a package that includes self care measures, guided imagery, neuro-linguistic programme, and thought field therapy | Not reported | The session involves listening to audios, didactic and experiential training.<br>The first session is assessment of the condition with the practice of guided imagery. Second session involves the construction of a personal and professional timeline. Session three, involves development of a self-management plan, thought field therapy and Neuro-linguistic. Session four focuses on supervising the self where the 'Letter from the Great Supervisor' is read by the nurse. Session five evaluates the programme goals address the pathways for recovery and closure. | Not reported | Group session | Five-weeks with five sessions, each lasting for 90 120 minutes |
| Swedish massage | Seo 2020 | Swedish massage is a method that can effectively apply the five (effleurage, petrissage, frication tapoment, vibration) according to each situation. | Massage table and knee support | Relaxation was allowed. After the experiment began, it blocked conversation, phone sounds, other noises, and electromagnetic waves that could act as variables in the experiment, minimizing the irritation of the surroundings, preventing the subject from sleeping during the experiment, and closing the eyes and taking part in the experiment comfortably. | Massage majors | Individual one-to-one | 20 minutes |
| Occupational health consultation | Taimela 2008 – high risk | The main purpose of the consultation was the | Not reported | The occupational nurse first started the consultation, and an occupational physician | Occupational nurse or | One-to-one session | The planned session length was 90 minutes |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | construction of an action plan, and if appropriate, referral to a further consultation by a specialist, or psychologist. | | joined the meeting later if needed. The individual findings of the questionnaire were available for the OHS professionals during the consultation. | occupational physician | | |
| Telephone health counselling | Taimela 2008 – intermediate risk | Telephone health counselling has been marketed as a low-cost intervention. | Not reported | Participants had access to medical counselling over the telephone from one phone advice centre. Employees received a letter with personal feedback of their results and invitation to call the phone advice centre in order to receive respective medical advice. Two reminders were sent. The switchboard was always open, and the cost for the telephone call was the same as for a local call. During the counselling the individual findings of the questionnaire were available for the nurses who also had access to relevant health databases while providing the health advice | All telephones were manned by trained nurses with several years of experience and specific training for their job. | Telephone one-to-one | Not reported |
| Expressive writing intervention | Tarquini 2016 | Pennbaker's technique focuses on re-examination of an important life event and finding any links between the | A set of instructions | The intervention group were asked to write according to a set of instructions which were read to them at the beginning of each session. They were | Instructions were read to the group by a researcher. | Group | 20 minutes once a week, for 3 consecutive weeks. |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | event and psychological effects to give closure. | | encouraged to write about an event and explore in depth their feelings and the events' link with their past, present or future. | | | |
| Combined CBT and CAM | Tsang 2015 | Based on cognitive behavioural therapy and complementary and alternative medicine principles and the unifying model of stress process | Participants log-book<br>Lectures,<br>Exercises | Sessions covered lecture, yoga, self-acupressure, self-management, aromatherapy and CBT | Certified instructors with backgrounds in psychology or occupational health | Group | Six session with each session comprising 1 hour of lecture and 1 hour of practice |
| Mindfulness-based stress reduction therapy | Yang 2018 | Mindfulness therapy consists of meditation, yoga and physical awareness, to improve self-regulation and relieve stress | Relaxing Chinese music | Each session included relaxation preparation, mindfulness breathing and mindfulness meditation | Not reported | In person | 9 weekly sessions |
| Mindfulness-based stress reduction | Zolnierczyk-Zreda 2016 | based on being aware of and attentive to momenta-to moment experiences and focuses on enhancing behavioural and psychological functioning | Audio recordings<br>homework | Sessions included sitting meditation, body scanning, mindful bodywork (yoga) and reflection | Trainers who had undergone Kabat-Zinn directed training | Not reported | 8 weekly sessions |

| Brief name | Studies | Rational, theory or goal | Materials used | Procedures used | Provider | Delivery method | Intensity/Duration |
|---|---|---|---|---|---|---|---|
| | | through self-regulation | | | | | |

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### 1.1.6 Summary of studies included in the qualitative evidence

**Table 4: Qualitative study**

| Study | Setting | Informants | Intervention | Method | Themes in study |
|---|---|---|---|---|---|
| Carolan 2017 (UK) | Workplace | Employees | | Structured telephone interview<br>Thematic analysis using Braun and Clarke method | Positive aspects of digital mental health interventions<br>Negative aspects of digital mental health interventions<br>Time needed for the intervention<br>Context<br>Setting<br>Programme content and design<br>Promotion by managers and employers |

### 1.1.7 Economic evidence

A guideline wide search of published cost-effectiveness evidence was carried out for review questions 1, 2, 3, 4 and 5. There were no eligible studies for RQ 1.

#### 1.1.7.1 Included studies

3432 records were assessed against the eligibility criteria.

3351 records were excluded based on information in the title and abstract. Both reviewers assessed all the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 81 documents were retrieved and assessed. 15 studies were assessed as meeting the eligibility criteria. Of these, 5 studies were assessed as meeting the eligibility criteria for RQ 5. Both reviewers assessed all the full texts. The level of agreement between the two reviewers was 100%.

#### 1.1.7.2 Excluded studies

66 full text documents were excluded for this guideline. The documents and the reasons for their exclusion are listed in Appendix J. Documents were excluded for the following reasons: review (n=32), no economic evaluation (n=18), ineligible outcomes (n=6), ineligible intervention (n=6), ineligible study design (n=2), and ineligible setting (n=2). The selection process is shown in Appendix G.

### 1.1.8 Summary of included economic evidence

**Table 5: Study details**

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| **Callander (2017)**<br>The Work Outcomes Research Cost-benefit (WORC) project intervention to reduce depressive symptoms vs. a control group with no further intervention.<br><br>The WORC intervention was spilt into a single intervention group who received one phone call from a project psychologist<br>and the care management group who received ongoing telephone-based support | Minor limitations [a] | Partly applicable [b] | The study conducted cost-benefit analysis (CBA) alongside randomised controlled trial (RCT) with a 12-month time horizon from an employer perspective. The outcome of interest was cost saved due to productivity from baseline to follow-up. Presenteeism, used to measure productivity, was calculated using the Health and Work Performance Questionnaire (HPQ). | **Incremental intervention costs per person [c]; AUD $:**<br>*CALCULATED BY YHEC* [d] Case management vs. single intervention<br>351.68<br>(=£248.06 in 2020 GBP) [d]<br><br>Case management vs. control<br>398.57<br>(=£281.13 in 2020 GBP) [d]<br><br>Single intervention vs. control<br>46.89<br>(=£33.07 in 2020 GBP) [d] | **Incremental effects:**<br>Not reported | **Net gain per person; AUS $:**<br>Case management<br>1,198.51<br>(=£845.37 in 2020 GBP) [d]<br><br>Single intervention<br>236.05<br>(=£166.50 in 2020 GBP) [d]<br><br>Control group<br>-2,625.83<br>(=-£1,852.12 in 2020 GBP) [d] | Not reported |

Abbreviations: CBA: cost-benefit analysis; HPQ: Health and Work Performance Questionnaire; ICER: incremental cost-effectiveness ratio; RCT: randomised controlled trial; WORC: Work Outcomes Research Cost-benefit

*(a) Sensitivity analyses were not conducted. Only presenteeism was considered. Other work-related costs were not included, such as sickness absence and staff turnover, and could affect cost-saving results from an employer's perspective.*

*(b) The intervention considered is relevant to the UK context, but caution is required when transferring the results of the study given the difference in prices and healthcare systems between the UK and the Australia.*
*(c) Intervention costs were set-up costs and treatment costs*
*(d) Converted by YHEC using historical exchange rates and PSSRU inflation indices.*

**Table 6: Study details**

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| **Ebert (2018)**<br>Guided internet-and-mobile supported occupational stress-management intervention (iSMI) vs. waitlist control (WLC) with treatment as usual | Minor limitations [a] | Partly applicable [b] | The study conducted cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) alongside a randomised controlled trial (RCT) with a 6-month time horizon from an employer's perspective | **Incremental total cost per person; mean, € [c]:**<br>iSMI vs. WLC<br>- 188<br>(=£177.54 in 2020 GBP) [f] | **Incremental effects:**<br>iSMI vs. WLC<br>0.36 more participants with symptom-free status [d] | **Incremental cost effectiveness ratios (ICER); €:**<br>iSMI vs. WLC<br>- 521 per symptom-free person<br><br>iSMI dominates WLC (lower cost and better outcomes)<br><br>Net benefit; €:<br>181 (-643 to 1042) saving per participant in first 6 months<br><br>ROI (95% CI); €:<br>0.61 (-2.2 to 3.5) per euro invested | There is a 67% probability that the iSMI generates better outcomes at lower costs compared with the WLC. If the employer is willing to pay €500, €1000 and €2000, respectively, for one additional symptom-free person, then there is an 80%, 90% and 98% probability that the iSMI is cost-effective compared with the WLC. |
| Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; ICER: incremental cost-effectiveness ratio; iSMI: internet stress-management intervention; perceived stress scale (PSS-10); QALY: quality-adjusted life year; RCT: randomised controlled trial; ROI: return on investment WLC; waitlist control | | | | | | | |

*(a) The trial had a short time-horizon that may not have captured the full effects of the intervention. Other work-related costs were not included, such as staff turnover, and could lead to greater cost-savings.*
*(b) The intervention considered is relevant to the UK context, but caution is required when transferring the results of the study given the difference in prices and healthcare systems between the UK and Germany.*
*(c) Total costs were the absenteeism, presenteeism and intervention costs.*
*(d) Symptom-free status was measured using the perceived stress scale (PPS-10). Symptom-free status was achieved when a participant scored > 2 standard deviations below then mean PPS-10 at baseline*
*(e) ROI was calculated as the total net benefit (from absenteeism and presenteeism) divided by the intervention cost.*
*(f) Converted by YHEC using historical exchange rates and PSSRU inflation indices.*

**Table 7: Study details**

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| **Geraedts (2015)**<br>A web-based guided self-help intervention for employees with depressive symptoms vs. care as usual (CAU) | Minor limitations [a] | Partly applicable [b] | The study conducted cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) alongside a randomised controlled trial (RCT) with a 12-month time horizon from an employer and societal perspective. The study considers 3 effect measures; depressive symptoms measured using the Center for Epidemiological Studies Depression- scale (CES-D) [c], clinical significant change | **Incremental total cost per person; € (95% CI):**<br>Intervention vs. control<br>Societal perspective [d]<br>-714 (-5018 to 3924)<br>(=-£656.42 in 2020 GBP) [h]<br><br>Employer perspective [e]<br>-508 (-8080 to 7088)<br>(=-£467.04 in 2020 GBP) [h] | **Incremental effects (95% CI):**<br>Intervention vs. control<br>Both perspectives<br>CES-D<br>-2.3 (-4.3 to -0.3)<br><br>*A negative value indicates that the intervention reduced depressive symptoms more than control.*<br><br>CSC<br>0.1 (0.0 to 0.2)<br><br>QALYs | **Incremental cost effectiveness ratio (ICER); €:**<br>Societal perspective<br>314 per 1-point decrease in depression symptoms<br><br>-6654 per extra participant with a clinically significant improvement in depression symptoms<br><br>532,959 per QALY gained<br><br>Employer perspective | Societal perspective<br>For depressive symptoms, 62.1% of cost-pairs indicated that the intervention was more-effective and less costly than CAU. At a willingness to pay (WTP) of zero and of €2,000 per point improvement, the probability of the intervention being cost-effective in comparison with CAU is 0.62 and 0.95, respectively.<br>For CSC, the probability of the intervention being cost-effective compared with CAU is 0.95 at a WTP of |

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| | | | (CSC) for depressive symptoms at 1-year and quality-adjusted life-years (QALYs) using EQ-5D | | 0.00 (-0.04 to 0.04) | 224 per 1-point decrease in depression symptoms<br><br>-4664 per extra participant with a clinically significant improvement in depression symptoms<br><br>382,354 per QALY gained<br><br>Net benefit (95% CI); €:<br>Employer perspective<br>508 (-7029 to 8160)<br><br>Benefit cost ratio (95% CI):<br>Employer perspective<br>2.8 (-25.7 to 27.6)<br><br>Return on investment [f], % (95% CI):<br>Employer | €44,000 per participant with a clinical significant change in depressive symptoms.<br>The maximum probability of the intervention being cost-effective in terms of QALYs gained was 0.62, irrespective of the WTP.<br>Employer perspective<br>For depressive symptoms, 62.0% of cost-pairs indicated that the intervention was more-effective and less costly than CAU. At a WTP of zero and of €3,500 per point improvement, the probability of the intervention being cost-effective in comparison with CAU is 0.55 and 0.95, respectively. For a participant with a clinical significant change in depressive |

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| | | | | | | perspective<br>178 (-2466 to 2863) | symptoms, a 0.95 probability of cost-effectiveness was reached at a WTP of €115,000.<br>The maximum probability of the intervention being cost-effective in terms of QALYs gained was 0.55, irrespective of the WTP.<br><br>Effect and cost differences were only slightly different in the sensitivity analyses and did not lead to different conclusions, indicating that the findings were robust.<br><br>There was a 0.63 probability that the intervention resulted in a positive financial return for the employer [f]. |

Abbreviations: CAU: care as usual; CES-D: Center for Epidemiological Studies Depression- scale; CI: confidence interval; CSC: clinical significant change; ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life-year; RCT: randomised controlled trial; WTP: willingness to pay

*(a) The trial had a short time-horizon that may not have captured the full effects of the intervention. Other work-related costs were not included, such as staff turnover, and could lead to greater cost-savings from an employer's perspective.*

*(b) The intervention considered is relevant to the UK context, but caution is required when transferring the results of the study given the difference in prices and healthcare systems between the UK and the Netherlands.*
*(c) CES-D scores range from zero to 60 with higher scores indicating the presence of more depressive symptoms.*
*(d) Costs were medical, domestic tasks, occupational health, absenteeism, presenteeism and intervention (excluding VAT) costs.*
*(e) Costs were occupational health, absenteeism, presenteeism and intervention costs.*
*(f) ROI was calculated as the total net benefit (from absenteeism, presenteeism and occupational health costs) divided by the intervention cost.*
*(g) Financial returns are positive if the following criteria are met: NB>0, BCR>1, and ROI>0.*
*(h) Converted by YHEC using historical exchange rates and PSSRU inflation indices.*

**Table 8: Study details**

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| **Kahlke (2019)**<br>Guided internet-and-mobile supported occupational stress-management intervention (iSMI) vs. waitlist control (WLC) with treatment as usual | Minor limitations [a] | Partly applicable [b] | The study conducted cost-effectiveness analysis (CEA) alongside a randomised controlled trial (RCT) with a 6-month time horizon from a societal perspective. | **Incremental total cost per person; mean, € [c]:**<br>iSMI vs. WLC<br>- 386<br>(=-£364.51 in 2020 GBP) [e] | **Incremental effects:**<br>iSMI vs. WLC<br>6.27 improvement in PSS-10 stress units<br><br>0.362 more participants with symptom-free status [d]<br><br>0.0074 QALYs per person | **Incremental cost effectiveness ratio (ICER); €:**<br>iSMI vs. WLC<br><br>iSMI dominates WLC (lower cost and better outcomes) for all 3 outcome measures (PSS-10, symptom-free status and QALYs) | There is a 70%, 70% and 69% probability that the iSMI dominates WLC for the 3 defined outcomes, respectively. Assuming a willing to pay (WTP) of €1000 and €3000 for gaining a symptom-free person, the intervention's probability rises to 85% and 97%, respectively. Assuming a WTP of €10,000 and €20,000 for 1 QALY gained, the probability rises to 73% and 76%, respectively. |

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| Abbreviations: CEA: cost-effectiveness analysis; ICER: incremental cost-effectiveness ratio; iSMI: internet stress-management intervention; perceived stress scale (PSS-10); QALY: quality-adjusted life year; RCT: randomised controlled trial; SD: standard deviation; WLC: waitlist control; WTP: willingness to pay | | | | | | | |

*(a) The trial had a short time-horizon that may not have captured the full effects of the intervention. Other work-related costs were not included, such as staff turnover, and could lead to greater cost-savings.*
*(b) The intervention considered is relevant to the UK context, but caution is required when transferring the results of the study given the difference in prices and healthcare systems between the UK and Germany.*
*(c) Total costs were health care costs (including the intervention), patient and family costs and productively losses (absenteeism, presenteeism).*
*(d) Symptom-free status was measured using the perceived stress scale (PPS-10). Symptom-free status was achieved when a participant scored > 2 standard deviations below then mean PPS-10 at baseline.*
*(e) Converted by YHEC using historical exchange rates and PSSRU inflation indices.*

**Table 9: Study details**

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| **Phillips (2014)** MoodGYM, an interactive computerized cognitive behavioural therapy, to improve employees' work-related performance and psychological well-being vs. an 'attentional' control [a] | Minor limitations [b] | Partly applicable [c] | The study conducted cost-effectiveness analysis (CEA) alongside a randomised controlled trial (RCT) evaluation with a 6-week and 12-week follow-up. Service use and sick leave were assessed via telephone interview using an adapted version of the | **Incremental total cost per person at 6-weeks [d]; mean, £:** *CALCULATED BY YHEC [e]* MoodGYM vs. control -24 (=£28.52 in 2020 GBP) [f] | **Incremental QALYs per person at 6-weeks:** *CALCULATED BY YHEC [e]* MoodGYM vs. control -0.001 | **Incremental cost effectiveness ratio (ICER); £:** *CALCULATED BY YHEC [e]* MoodGYM vs. control 24,000 At 6-weeks, MoodGYM resulted in slightly lower costs and a slightly lower QALY gain. | Not reported |

| Study | Limitations | Applicability | Other comments | Incremental | | | Uncertainty |
|---|---|---|---|---|---|---|---|
| | | | | Costs | Effects | Cost-effectiveness | |
| | | | Client Service Receipt Inventory (CSRI) and quality of life was assessed using the EQ-5D. | | | | |

Abbreviations: CSRI: Client Service Receipt Inventory; ICER: incremental cost-effectiveness ratio; QALY: quality adjusted life year; RCT: randomised controlled trial; YHEC: York Health Economic Consortium

*(a) MoodGYM consists of 5 interactive modules to complete weekly, whereas the control group were sent a weekly link to 5 websites with general information about mental health.*
*(b) The trial had a short time-horizon that may not have captured the full effects of the intervention. 12-week costs were not reported and the study did not conduct sensitivity analysis.*
*(c) The perspective was not clearly stated but it is assumed a societal perspective based on the costs that were included.*
*(d) Total costs were the costs associated with hospital services, community services and lost work. The intervention is a freely available course and therefore has no costs associated.*
*(e) Calculations performed by YHEC are unadjusted.*
*(f) Converted by YHEC using historical exchange rates and PSSRU inflation indices.*

### 1.1.9 Economic model

A simple cost-consequence model was developed which covers more than 1 evidence review in the guideline so the full write up is contained in a separate report (Evidence Review G).

The model was used to establish the impact of mental wellbeing interventions at work over a one-year time horizon from both the employer perspective and a wider perspective including employee outcomes. The model synthesized evidence from a range of sources including the effectiveness and cost-effectiveness reviews, and other relevant studies.

The number of employees receiving the intervention was multiplied by each category in the model: the cost of the intervention, the cost of absenteeism, the cost of presenteeism, and the cost of staff turnover. These figures were then summed in order to produce the net cost impact of the intervention.

A hypothetical case study was modelled using a combination of published data and assumptions. In addition, several hypothetical scenarios were considered which were based on entirely assumption-based inputs. It is intended that the model will be used as an interactive cost-calculator for employers who are considering implementing a mental health intervention at work, or other interested parties. The model allows users to input values and generate bespoke results, specific to their workplace.

The hypothetical case study analysis (based on a combination of published evidence and assumptions) showed that mental health interventions at work can be cost saving for an employer. However, the results depend on a myriad of factors such as the size of the organisation and the cost of absenteeism.

From an employer's perspective, an intervention is more likely to result in cost savings when: (i) the baseline level of absenteeism is high, (ii) baseline presenteeism is relatively low, (iii) baseline staff turnover is high, (iv) the intervention is low cost, and (iv) the intervention is demonstrated to have a positive influence on absenteeism, presenteeism or turnover. Every single employer will have a unique set of characteristics and, therefore, it is not possible to make a generalised statement about which interventions are likely to be cost-effective.

### 1.1.10 Summary of the quality of the effectiveness evidence, certainty of the qualitative evidence and economic evidence statements

#### Quantitative evidence

#### Cognitive behavioural therapy (CBT)

See forest plots for Cognitive behaviour therapy (E1.1 to E1.8) and GRADE profile F.1.1

| **CBT versus control OK for** | | | | | | |
|---|---|---|---|---|---|---|
| **Patient or population:**<br>**Settings:**<br>**Intervention:** CBT versus control OK | | | | | | |
| **Outcomes** | **Illustrative comparative risks* (95% CI)** | | **Relative effect (95% CI)** | **No of Participants (studies)** | **Quality of the evidence (GRADE)** | **Comments** |
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **CBT versus control OK** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.48 standard deviations** | | 89<br>(2 studies) | ⊕⊕⊖⊖<br>**low** [1,2,3,4] | Benefit |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **lower** (0.91 to 0.06 lower) | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.15 standard deviations lower** (0.41 lower to 0.12 higher) | | 586 (3 studies) | ⊕⊖⊖⊖ **very low**[1,3,5,6] | No difference |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.36 standard deviations lower** (0.6 to 0.12 lower) | | 996 (6 studies) | ⊕⊕⊖⊖ **low**[3,4,5,7] | Benefit |
| **Productivity** | | The mean productivity in the intervention groups was **0.07 lower** (0.3 lower to 0.15 higher) | | 300 (1 study) | ⊕⊕⊖⊖ **low**[3,6,7,8] | No difference |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.15 standard deviations lower** (0.43 lower to 0.14 higher) | | 570 (2 studies) | ⊕⊖⊖⊖ **very low**[3,5,6,7] | No difference |
| **Absenteeism** | **115 per 1000** | **130 per 1000** (29 to 584) | **RR 1.13** (0.25 to 5.06) | 49 (1 study) | ⊕⊕⊖⊖ **low**[3,6,7,8] | No difference |
| **Presenteeism** | | The mean presenteeism in the intervention groups was **0.25 standard deviations lower** (0.43 to 0.06 lower) | | 688 (3 studies) | ⊕⊕⊕⊖ **moderate**[3,4,5,7] | Benefit |
| **Job satisfaction** | | The mean job satisfaction in the intervention groups was 0.09 standard deviations higher (0.2 lower to 0.38 higher) | | 356 (2 studies) | ⊕⊕⊖⊖ **low**[2,3,6,7] | No difference |
| **Mental health literacy** | | The mean mental health literacy in the intervention groups was **0. lower** (0.02 lower to 0.21 higher) | | 300 (1 study) | ⊕⊕⊖⊖ **low**[3,6,7,8] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Very serious concerns due to self-reported outcomes and missing outcome data[2] No concerns over inconsistency (I2 < 50%)
[3] No concerns over directness (Population, intervention and outcome match review protocol)
[4] No concerns over imprecision (95% CI do not cross line of no effect)
[5] Serious concerns over inconsistency (I2 50%-75%)
[6] No concerns over inconsistency (Single-study analysis)
[7] Serious concerns due to self-reported outcomes
[8] No concerns over inconsistency (Single-study analysis)

## 1 Mindfulness

2 See forest plots Mindfulness (E.2.1 to E.2.4) and GRADE profile F.1.2

**Mindfulness for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** mindfulness

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Mindfulness** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.57 standard deviations lower** (0.8 to 0.33 lower) | | 283 (3 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Mental wellbeing - HCP** | | The mean mental wellbeing - hcp in the intervention groups was **0.55 standard deviations lower** (0.96 to 0.14 lower) | | 95 (1 study) | ⊕⊕⊕⊖ **moderate**[1,3,4,5] | Benefit |
| **Mental wellbeing - Non-HCP** | | The mean mental wellbeing - non-hcp in the intervention groups was **0.57 standard deviations lower** (0.87 to 0.28 lower) | | 188 (2 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Job stress** | | The mean job stress in the intervention groups was **0.75 standard deviations lower** (1.47 to 0.03 lower) | | 369 (5 studies) | ⊕⊖⊖⊖ **very low** [1,3,4,6] | Benefit |
| **Job stress - HCP** | | The mean job stress - hcp in the intervention groups was **1.62 standard deviations lower** (2.05 to 1.2 lower) | | 117 (2 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Job stress - Non-HCP** | | The mean job stress - non-hcp in the intervention groups was **0.29 standard deviations lower** (0.97 lower to 0.39 higher) | | 188 (2 studies) | ⊕⊖⊖⊖ **very low**[3,6,7,8] | No difference |
| **Job stress - Not specified** | | The mean job stress - not specified in the intervention groups was **0.17 standard deviations lower** (0.67 lower to 0.32 higher) | | 64 (1 study) | ⊕⊕⊖⊖ **low**[1,3,5,8] | No difference |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.49 standard deviations lower** (0.79 to 0.19 lower) | | 347 (4 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Mental health symptoms - HCP** | | The mean mental health symptoms - hcp in the intervention groups was **0.68 standard deviations lower** (1.09 to 0.26 lower) | | 95 (1 study) | ⊕⊕⊕⊖ **moderate**[1,3,4,5] | Benefit |
| **Mental health symptoms - Non-HCP** | | The mean mental health symptoms - non-hcp in the intervention groups was **0.58 standard deviations lower** (0.88 to 0.29 lower) | | 188 (2 studies) | ⊕⊕⊖⊖ **low**[2,3,4,7] | Benefit |
| **Mental health symptoms - Not specified** | | The mean mental health symptoms - not specified in the intervention groups was **0 standard deviations higher** (0.49 lower to 0.49 higher) | | 64 (1 study) | ⊕⊕⊖⊖ **low**[1,3,5,8] | No difference |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.81 standard deviations lower** (1.15 to 0.47 lower) | | 144 (1 study) | ⊕⊕⊕⊖ **moderate**[1,3,4,5] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] No concerns as I-squared is less than 50%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Single-study analysis
[6] Very serious concerns as I-squared is greater than 75%
[7] Very serious concerns due to self-reported outcomes and missing outcome data
[8] Serious concerns as 95% CIs cross the line of no effect

## 1 Stress management

2 See forest plots Stress management (E.3.1 to E.3.7) and GRADE profile F.1.3

**Stress management for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** stress management

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Stress management** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.79 standard deviations lower** (0.98 to 0.6 lower) | | 883 (4 studies) | ⊕⊕⊖⊖ **low**[1,2,3,4] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.67 standard deviations lower** (0.93 to 0.4 lower) | | 959 (5 studies) | ⊕⊖⊖⊖ **very low**[1,3,4,5] | Benefit |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.06 standard deviations lower** (0.24 lower to 0.12 higher) | | 867 (4 studies) | ⊕⊕⊖⊖ **low**[2,3,6,7] | No difference |
| **Presenteeism** | | The mean presenteeism in the intervention groups was **0.16 standard deviations lower** (0.32 lower to 0.01 higher) | | 791 (3 studies) | ⊕⊕⊖⊖ **low**[1,2,3,7] | No difference |
| **Job satisfaction** | | The mean job satisfaction in the intervention groups was **0.17 standard deviations lower** (0.31 to 0.03 lower) | | 791 (3 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Quality of life** | | The mean quality of life in the intervention groups was **0.58 standard deviations lower** (0.77 to 0.4 lower) | | 527 (2 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Mental health literacy** | | The mean mental health literacy in the intervention groups was **0.51 standard deviations lower** (0.65 to 0.37 lower) | | 791 (3 studies) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Very serious concerns due to self-reported outcomes, missing outcome data and lack of reporting for all outcomes
[2] No concerns as I-squared is less than 50%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Serious concerns as I-squared is between 50% and 75%
[6] Serious concerns due to self-reported outcomes
[7] Serious concerns as 95% CIs cross the line of no effect

## 2 Problem-solving training

3 See forest plots Problem-solving (E.4.1 to E.4.4) and GRADE profile F.1.4

**Problem solving for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** problem solving

| **Outcomes** | **Illustrative comparative risks* (95% CI)** | | **Relative effect (95% CI)** | **No of Participants (studies)** | **Quality of the evidence (GRADE)** | **Direction of effect** |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Problem solving** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.4 standard deviations lower** (0.72 to 0.07 lower) | | 150 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.39 standard deviations lower** (0.72 to 0.07 lower) | | 150 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.25 standard deviations lower** (0.57 lower to 0.07 higher) | | 150 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,5] | No difference |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Quality of life** | | The mean quality of life in the intervention groups was **0.27 standard deviations lower** (0.59 lower to 0.05 higher) | | 150 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,5] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Serious concerns as 95% CIs cross the line of no effect

## 1 Acceptance and commitment therapy

2 See forest plots Acceptance and commitment (E.5.1 to E.5.4) and GRADE profile F.1.5

**Acceptance and commitment therapy for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** acceptance and commitment therapy

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Acceptance and commitment therapy** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **1.23 standard deviations lower** (2.99 lower to 0.53 higher) | | 106 (2 studies) | ⊕⊖⊖⊖ **very low**[1,2,3,4] | No difference |
| **Job stress** | | The mean job stress in the intervention groups was **0.73 standard deviations lower** (1.14 to 0.33 lower) | | 106 (2 studies) | ⊕⊕⊕⊖ **moderate**[1,3,5,6] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.7 standard deviations lower** (1.36 to 0.04 lower) | | 38 (1 study) | ⊕⊕⊕⊖ **moderate**[1,3,6,7] | Benefit |
| **Job satisfaction** | | The mean job satisfaction in the intervention groups was **0.35 standard deviations lower** (1.22 lower to 0.53 higher) | | 106 (2 studies) | ⊕⊖⊖⊖ **very low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Very serious concerns as I-squared is greater than 75%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as I-squared is less than 50%
[6] No concerns as 95% CIs do not cross the line of no effect
[7] Single-study analysis

## 1 Auriculotherapy

2 See forest plot Auriculotherapy (E.6.1) and GRADE profile F.1.6

**Auriculotherapy for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** auriculotherapy

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Auriculotherapy** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.86 standard deviations lower** (1.36 to 0.35 lower) | | 173 (2 studies) | ⨁⨁⊖⊖ **low**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Serious concerns as I-squared is between 50% and 75%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 3 Internet sleep recovery

4 See forest plots Internet sleep recovery (E.7.1 to E.7.3) and GRADE profile F.1.7

**Internet sleep recovery for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** internet sleep recovery

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Internet sleep recovery** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **1.07 standard deviations lower** (1.44 to 0.7 lower) | | 128 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Job stress** | | The mean job stress in the intervention groups was **0.73 standard deviations lower** (1.09 to 0.37 lower) | | 128 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.57 standard deviations lower** (0.93 to 0.22 lower) | | 128 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 1 Web-guided self help

2 See forest plots Web-guided self-help (E.8.1 to E.8.5) and GRADE profile F.1.8

**Web guided self-help for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** web guided self-help

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Web guided self-help** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.15 standard deviations lower** (0.5 lower to 0.2 higher) | | 125 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.23 standard deviations lower** (0.59 lower to 0.12 higher) | | 125 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Productivity** | | The mean productivity in the intervention groups was **0.06 standard deviations lower** (0.41 lower to 0.29 higher) | | 125 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.02 standard deviations higher** (0.33 lower to 0.37 higher) | | 125 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Uptake of support services** | **202 per 1000** | **95 per 1000** (48 to 186) | **RR 0.47** (0.24 to 0.92) | 230 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,5] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

## 1 Individualised mailed advice

2 See forest plots Mailed advice (E.9.1 to E.9.2) and GRADE profile F.1.9

**Individualised mailed advice versus control OK for Individual targeted**

**Patient or population:** patients with Individual targeted
**Settings:**
**Intervention:** Individualised mailed advice versus control OK

| **Outcomes** | **Illustrative comparative risks* (95% CI)** | | **Relative effect (95% CI)** | **No of Participants (studies)** | **Quality of the evidence (GRADE)** | **Comments** |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Individualised mailed advice versus control OK** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.04 standard deviations lower** (0.35 lower to 0.28 higher) | | 158 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Absenteeism** | **623 per 1000** | **655 per 1000** (517 to 829) | **RR 1.05** (0.83 to 1.33) | 158 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Concerns over risk of bias (Use of self-reported outcome)
[2] No concerns over inconsistency (Single-study analysis)
[3] No concerns over directness (Population, intervention and outcome match review protocol)
[4] Concerns over imprecision (95% CI cross line of no effect)

## 1 Brief education

2 See forest plots Brief education (E.10.1 to E.10.2) and GRADE profile F.1.10

**Brief educational intervention for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** brief educational intervention

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Brief educational intervention** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.28 standard deviations higher** (0.35 lower to 0.9 higher) | | 40 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Job stress** | | The mean job stress in the intervention groups was **0.28 standard deviations higher** (0.35 lower to 0.9 higher) | | 40 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## 3 Expressive writing

4 See forest plots Expressive writing (E.11.1 to E.11.3) and GRADE profile F.1.11

**Expressive writing for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** expressive writing

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Expressive writing** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.8 standard deviations lower** (1.49 to 0.1 lower) | | 35 (1 study) | ⊕⊖⊖⊖ **very low**[1,2,3,4] | Benefit |
| **Job stress** | | The mean job stress in the intervention groups was **0.91 standard deviations lower** (1.61 to 0.21 lower) | | 35 (1 study) | ⊕⊖⊖⊖ **very low**[1,2,3,4] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **1.39 standard deviations lower** (2.14 to 0.64 lower) | | 35 (1 study) | ⊕⊖⊖⊖ **very low**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 1 CBT combined with problem solving training

2 See forest plots Cognitive behaviour therapy combined with problem-solving training (E.12.1
3 to E.12.3) and GRADE profile F.1.12

**CBT + PST versus control OK for Individual targeted**

**Patient or population:** patients with Individual targeted
**Settings:**
**Intervention:** CBT + PST versus control OK

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **CBT + PST versus control OK** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.30 standard deviations lower** (0.63 lower to 0.04 higher) | | 139 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.41 standard deviations** | | 139 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,5] | Benefit |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **lower** (0.75 to 0.07 lower) | | | | |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.22 standard deviations lower** (0.55 lower to 0.11 higher) | | 139 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Absenteeism** | **314 per 1000** | **204 per 1000** (113 to 365) | **RR 0.65** (0.36 to 1.16) | 139 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Concerns over risk of bias (Use of self-reported outcome)
[2] No concerns over inconsistency (Single-study analysis)
[3] No concerns over directness (Population, intervention and outcome match review protocol)
[4] Concerns over imprecision (95% CI cross line of no effect)
[5] No concerns over imprecision (95% CI do not cross line of no effect)

## 1 CBT combined with Complementary Alternative Therapy

2 See forest plots Cognitive behaviour therapy combined with Complementary Alternative
3 Therapy (E.13.1 to E.13.4) and GRADE profile F.1.13

**CBT + CAM for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** CBT + CAM

| **Outcomes** | **Illustrative comparative risks* (95% CI)** | | **Relative effect (95% CI)** | **No of Participants (studies)** | **Quality of the evidence (GRADE)** | **Direction of effect** |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **CBT + CAM** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.38 standard deviations higher** (0.03 lower to 0.79 higher) | | 93 (1 study) | ⨁⨀⨀⨀ **very low**[1,2,3,4] | No difference |
| **Job stress** | | The mean job stress in the intervention groups was **0.57 standard deviations lower** (0.99 to 0.16 lower) | | 93 (1 study) | ⨁⨀⨀⨀ **very low**[1,2,3,5] | Benefit |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.11 standard deviations lower** (0.52 lower to 0.29 higher) | | 93 (1 study) | ⨁⨀⨀⨀ **very low**[1,2,3,4] | No difference |
| **Job satisfaction** | | The mean job satisfaction in the intervention groups was **0.06 standard deviations higher** (0.34 lower to 0.47 higher) | | 93 (1 study) | ⨁⨀⨀⨀ **very low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

## 1 CBT combined with a discussion group

See forest plots Cognitive behaviour therapy combined with a discussion group (E.14.1 to E.14.5) and GRADE profile F.1.14

**CBT + Discussion versus control OK for Individual targeted**

**Patient or population:** patients with Individual targeted
**Settings:**
**Intervention:** CBT + Discussion versus control OK

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **CBT + Discussion versus control OK** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **0.14 standard deviations lower** (0.67 lower to 0.39 higher) | | 54 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Job stress** | | The mean job stress in the intervention groups was **0.30 standard deviations lower** (0.84 lower to 0.24 higher) | | 54 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.05 standard deviations lower** (0.59 lower to 0.48 higher) | | 54 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Absenteeism** | **231 per 1000** | **46 per 1000** (7 to 348) | **RR 0.2** (0.03 to 1.51) | 48 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |
| **Job satisfaction** | | The mean job satisfaction in the intervention groups was **0 standard deviations higher** (0.53 lower to 0.53 higher) | | 54 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Concerns over risk of bias (Use of self-reported outcome)
[2] No concerns over inconsistency (Single-study analysis)
[3] No concerns over directness (Population, intervention and outcome match review protocol)
[4] Concerns over imprecision (95% CI cross line of no effect)

## 1 Stress management combined with coping skills

2 See forest plot Stress management combined with coping skills (E.15.1) and GRADE profile
3 F.1.15

**Stress management + coping for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** Stress management + coping

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Stress management + coping** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.28 standard deviations lower** (0.66 lower to 0.11 higher) | | 104 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## 4 Positive psychotherapy

5 See forest plot Positive psychotherapy (E.16.1) and GRADE profile F.1.16

**Positive psychotherapy for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** positive psychotherapy

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Positive psychotherapy** | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **1 standard deviations lower** (1.45 to 0.56 lower) | | 97 (1 study) | ⨁⨁⨀⨀ **low**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Ver serious concerns due to self-reported outcomes and lack of primary outcome reporting
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 1 Imagery

2 See forest plot Imagery (E.17.1) and GRADE profile F.1.17

**Imagery for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** imagery

| **Outcomes** | **Illustrative comparative risks* (95% CI)** | | **Relative effect (95% CI)** | **No of Participants (studies)** | **Quality of the evidence (GRADE)** | **Direction of effect** |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | **Control** | **Imagery** | | | | |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.1 standard deviations higher** (0.33 lower to 0.53 higher) | | 104 (1 study) | ⨁⨁⨁⨀ **moderate**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 955 CIs cross the line of no effect

## 3 Massage therapy

4 See forest plot Massage therapy (E.18.1) and GRADE profile F.1.18

**Massage therapy for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** massage therapy

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk<br>**Control** | Corresponding risk<br>**Massage therapy** | | | | |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **1.37 standard deviations lower** (1.94 to 0.8 lower) | | 60 (1 study) | ⨁⨁⨁⊖ **moderate**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 1 Occupational health consultation

2 See forest plot Occupational health consultation (E.19.1) and GRADE profile F.1.19

**Occupational health consultation for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** OH Consultation

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk<br>**Control** | Corresponding risk<br>**OH Consultation** | | | | |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.22 standard deviations lower** (0.42 to 0.02 lower) | | 384 (1 study) | ⨁⨁⨁⨁ **high**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 1 Physical exercise

2 See forest plot Physical exercise (E.20.1 to E20.3) and GRADE profile F.1.20

**Exercise for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** exercise

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk **Control** | Corresponding risk **Exercise** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **0.38 standard deviations lower** (0.87 lower to 0.12 higher) | | 64 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Mental health symptoms** | | The mean mental health symptoms in the intervention groups was **0.53 standard deviations lower** (1.9 lower to 0.84 higher) | | 64 (2 studies) | ⊕⊖⊖⊖ **very low**[1,3,4,5] | No difference |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.63 standard deviations lower** (1.49 lower to 0.24 higher) | | 22 (1 study) | ⊕⊕⊕⊖ **moderate**[2,3,4,6] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] Serious concerns as I-squared is greater than 50%
[6] No concerns

## 1 Accelerated recovery programme

2 See forest plot Accelerated recovery programme (E.21.1) and GRADE profile F.1.21

**Accelerated recovery programme for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** accelerated recovery programme

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk<br>**Control** | Corresponding risk<br>**Accelerated recovery programme** | | | | |
| **Job stress** | | The mean job stress in the intervention groups was **4.39 standard deviations lower** (5.06 to 3.72 lower) | | 120 (1 study) | ⨁⨁⨁⊖ **moderate**[1,2,3,4] | Benefit |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## 3 Medical counselling

4 See forest plot Medical counselling (E.22.1) and GRADE profile F.1.22

**Medical counselling for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** medical counselling

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk<br>**Control** | Corresponding risk<br>**Medical counselling vs control** | | | | |
| **Absenteeism** | | The mean absenteeism in the intervention groups was **0.01 standard deviations higher** (0.17 lower to 0.18 higher) | | 502 (1 study) | ⨁⨁⨁⊖ **moderate**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## 1 Affect School

2 See GRADE profile Affect school (F.1.23) (There are no forest plots for these outcomes)

**Affect school for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** affect school

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk **Control** | Corresponding risk **Affect school** | | | | |
| **Job stress** | Effect size 1.16 | Effect size 0.26 | | 37 (1 study) | ⊕⊕⊖⊖ **low**[2,3,4,5] | No difference |
| **Mental health symptoms** | Effect size 0.47 | Effect size 0.11 | | 37 (1 study) | ⊕⊕⊖⊖ **low**[2,3,4,5] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Effect size calculation so that positive = improvement and negative = deterioration
[2] Serious concerns due to self-reported outcomes
[3] Single-study analysis
[4] No concerns as population, intervention, comparator and outcome match the review protocol
[5] Concerns over imprecision as no variance was provided

## 3 Preventive coaching

4 See forest plot (for 2 outcomes only) Preventive coaching E.23.1 to E.23.2 and GRADE
5 profile F.1.24

**Preventive coaching for employees who experience or are at risk of poor mental wellbeing**

**Patient or population:** employees who experience or are at risk of poor mental wellbeing
**Settings:** workplace
**Intervention:** preventive coaching

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Direction of effect |
|---|---|---|---|---|---|---|
| | Assumed risk<br>**Control** | Corresponding risk<br>**Preventive coaching** | | | | |
| **Mental wellbeing** | | The mean mental wellbeing in the intervention groups was **2.24 lower** (4.9 lower to 0.42 higher) | | 151 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Job stress** | | The mean job stress in the intervention groups was **0.51 lower** (0.83 to 0.18 lower) | | 151 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,5] | Benefit |
| **Mental health symptoms** | | The mean job stress in the intervention groups was **1.43 lower** (2.47 to 0.4 lower) | | 151 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,5] | Benefit |
| **Quality of life** | | The mean job stress in the intervention groups was **0.39 lower** (0.66 to 0.11 lower) | | 151 (1 study) | ⊕⊕⊕⊖ **moderate**[1,2,3,5] | Benefit |
| **Job satisfaction** | **612 per 1000** | **569 per 1000** (434 to 753) | **RR 0.93** (0.71 to 1.23) | 137 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |
| **Absenteeism** | **746 per 1000** | **761 per 1000** (634 to 925) | **RR 1.02** (0.85 to 1.24) | 139 (1 study) | ⊕⊕⊖⊖ **low**[1,2,3,4] | No difference |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

# 1 Qualitative evidence

## 2 Table 10: Summary of key themes

| Review theme and subthemes | Studies contributing | Informants | Summary | Supporting statements | CERQual – confidence in the evidence |
|---|---|---|---|---|---|
| **Positive aspects of digital mental health interventions** | | | | | |
| Convenience | Carolan 2017 | Employees | Participants liked being able to access the intervention a t their own pace and when convenient to them. Some participants valued the ability to take time out from a stressful situation in the workplace and to focus on themselves | 'It's incredibly accessible both in terms that I could choose when I was engaging with it, and it allowed me therefore to kind of pace myself and reflect on things and then go back to things when I wanted to rather than saying: "Well you've got a session, it's at 2 o'clock on a Friday and that's it, that's your only window". So I think it made it in some senses more live for me rather than an event that you go to'. [Robert, 46 years, university one] | Low |
| Discreteness and anonymity. | Carolan 2017 | Employees | Participants felt that the anonymity of the intervention help overcome their fear of being stigmatised for revealing their mental health issues or colleagues and employers. It was seen as a useful way of engaging with support. | I think also it's very discreet. If you have to shuffle off and actually see somebody you know face to face, it's a bit more public, people are more likely to know about it. [Fiona, 62 years, third sector] | Low |
| Need for discipline | Carolan 2017 | Employees | Some missed the discipline that having a fixed appointment gives. | 'It's good not to have to do things in a certain time but it's also not good because you can often think" Actually I'll do it later," and never get round to it.[...] If it's online it's down to the individual themselves to go and do what they are required to do'.[Simon, 48 years, university two]. | Low |
| **Barriers to the intervention** | | | | | |

| Review theme and subthemes | Studies contributing | Informants | Summary | Supporting statements | CERQual – confidence in the evidence |
|---|---|---|---|---|---|
| Time needed for the intervention | Carolan 2017 | Employees | Over half of the participants found it difficult to fine the time to do the intervention citing lack of time and workloads as the main reasons for not engaging as much as they would have liked. | "Oh god, have I really got time to do this today? Am I going to feel guilty for leaving my colleagues?" [Jane, 28 years, third sector] | Low |
| Motivation | Carolan 2017 | Employees | it was noted that for some people the mental health symptoms they were experiencing may mean they lacked the motivation to engage with the intervention. | Probably at the time, um I was very low, very depressed. …….. I didn't have any motivation at all. [Chloe, 44 years, telecommunication] | Low |
| Self-image. | Carolan 2017 | Employees | Some were aware that they presented themselves as strong and capable to colleagues. Having to reflect on their mental health while in the workplace may make them feel exposed | .'….it starts you having to think about the other stuff that's affecting you internally but you're managing to put on a pretty OK persona when you're at work so then it just felt like I was having to...I didn't want to expose myself too much I suppose'. [Anna, 47 years, third sector] | Low |
| Physical space in the workplace. | Carolan 2017 | Employees | There were concerns over accessing the system in an open-plan office where privacy was a concern. | 'And the other problem is sitting in an open plan, hot-desking space. ……So I don't know if there's a sense of feeling that other colleagues can see what you're working on, they can see the screen of your computer'. [Natalie, 40 years, third sector] | Low |
| Separating work from therapy. | Carolan 2017 | Employees | Some participants that they missed out on they did not benefit from having the spatial distance or temporal space from work that they would with a face- to-face appointment | ''You're doing something very reflective and personal that might make you feel uncomfortable feelings, and then to go back into work mode immediately. I guess think even if you go to a counselling | Low |

| Review theme and subthemes | Studies contributing | Informants | Summary | Supporting statements | CERQual – confidence in the evidence |
|---|---|---|---|---|---|
| | | | | session you have that physical journey back to work which helps switch modes back and so you've got time to kind of leave those feelings behind'. [Sue, 43 years, university two] | |
| **Facilitators** | | | | | |
| Programme content and design | Carolan 2017 | Employees | It was noted that interesting content and interactive features made it easier for participants to engage with the intervention. For example, know how long each module would take allowed participants to schedule and plan while progress meters and reminders and weekly motivational message from e-Coach were also useful features. | 'It was in nice bite size chunks. It was well presented. It was quite enjoyable. Yeah, it was quite enjoyable to do. It was good taking yourself out of the work situation for a bit, before going back in again. So I mean it was just a very positive experience so I think that just encouraged me to carry on with it. [Claire,57 years, university one]. | Moderate |
| Promotion by managers and employers | Carolan 2017 | Employees | Participants consider it imported to have the support of line-managers and employers and they considered that this give the intervention a level of legitimacy. | I think probably the fact that this was circulated by the university, it probably added a bit of...almost legitimacy about it, I guess. This was something that was supported by the university, which is probably a little bit silly but when you're in a stressed situation it is just the knowledge that yeah well the university said this is an ok thing to do, it's ok for me to take time to be working through this and it's to their benefit because if I'm working more effectively then they benefit as well. [Claire, | Moderate |

| Review theme and subthemes | Studies contributing | Informants | Summary | Supporting statements | CERQual – confidence in the evidence |
|---|---|---|---|---|---|
| | | | | 57 years, university one] | |

See GRADE-CERQual profiles F.2.1 to F.2.3

## Mixed methods

Meta-analyses from 6 RCTs showed that digital cognitive behavioural therapy (CBT)-based interventions are effective in improving mental wellbeing and mental health symptoms. These findings are supported by qualitative evidence from 1 study (Carolan et al 2018), where participants reported positive aspects associated with digital mental health interventions, including convenience, and discreteness and anonymity. However, the quantitative evidence showed no difference in outcomes of job stress, productivity, absenteeism, presenteeism, or mental health literacy. The qualitative evidence indicated that time was a barrier to participation in digital mental health interventions; these time pressures could contribute to the lack of improvement in job stress or productivity. The quantitative evidence indicated that the intervention did not improve mental health literacy, which has not been explored in the qualitative evidence. The qualitative evidence also highlights that promotion of the intervention by managers and employers was a facilitator to the programme, however, the quantitative evidence did not explore whether the intervention led to any improvements in work climate.

No qualitative evidence was identified for most of the interventions covered in the quantitative evidence, including mindfulness, stress management, problem solving, acceptance and commitment therapy, auriculotherapy, internet sleep recover, web-guided self-help. Individualised mailed advice, brief education, positive psychotherapy, imagery, massage therapy, occupational health consultation, physical exercise, accelerated recovery programme, medical counselling, affect school, and preventive coaching, as well as interventions combining CBT and problem solving training, CBT and complementary alternative therapy, and CBT with discussion group.

## Cost effectiveness

- Callander (2017) found that the Work Outcome Cost-benefit (WORC) project for early intervention for depression was effective as increasing productivity of employees with depressive symptoms. The study demonstrated that the costs associated with implementing the intervention were offset by the value of the productivity gains. Participants in the case management group, with ongoing telephone support, showed the highest level of net gain of $1199 (=£845.71 in 2020 GBP) per person, with participants in the single intervention group, receiving one telephone call, showed a smaller net gain of $236 (=£166.46 in 2020 GBP) per person. The control group, who received no intervention, showed a net gain of -$2,626 (=-£1,852.24 in 2020 GBP). The benefits associated with the intervention were limited to productivity, and sensitivity analyses were not explored. The analysis was assessed as partly application to the review question, with minor limitations.

- Ebert (2018) found that an internet-based stress management intervention (iSMI) for stress reduction was cost-effective compared with a waitlist control group (WLC) in a population with elevated symptoms of perceived stress. The economic evaluation showed iSMI dominates WLC (lower cost and better outcomes) for symptom-free status from an employer's perspective. There was a net benefit saving of £181 (=£201.10 in 2020 GBP) per participant in first 6 months and a return on investment of €0.61 per euro invested. Sensitivity analysis found a 67% probability that the iSMI generates better outcomes at lower costs compared with the WLC. At a willingness to pay (WTP) threshold of €500 (=£472.17 in 2020 GBP) for an additional symptom-free person, there is an 82% probability iSMI is cost-effective compare to WLC. Sensitivity analyses confirmed the robustness of the findings. The author comments that the generalizability of the study findings may be limited due to the self-selection of participants and that including additional work-related costs (such as staff turnover) could affect the results. The economic analysis was conducted alongside the same randomised controlled trial (RCT) used in Kahlke (2019). The analysis was assessed as partly applicable to the review question, with minor limitations.
- Geraedts (2015) found the Happy@Work intervention was effective in reducing depressive symptoms but may not be judged as cost- effective in comparison with care as usual (CAU) due to costs . The cost-effectiveness of the intervention will depend on the decision-makers (societal or company) willingness to pay (WTP) for an improvement in depressive symptoms and the probability of cost-effectiveness they perceive to be acceptable. At a WTP of zero per point improvement in depressive symptoms and clinical significant change, the intervention's probabilities of cost-effectiveness were 0.62 (societal) and 0.55 (employer), increasing to 0.95 with a WTP of €2,000 (=£1,838.72 in 2020 GBP) (societal) and €3,500 (=£3,217.77 in 2020 GBP) (employer). For quality-adjusted life-year (QALYs), the maximum probabilities of cost-effectiveness were low (≤ 0.62). Effect and cost differences were only slightly different in the sensitivity analyses and did not lead to different conclusions, indicating that the findings were robust. The analysis was assessed as partly application to the review question, with minor limitations.
- Kahlke (2019) found that an internet-based stress management intervention (iSMI) for stress reduction was cost-effective compared with a waitlist control group (WLC) in a population with elevated symptoms of perceived stress. The economic evaluation showed iSMI dominates WLC (lower cost and better outcomes) for 3 outcome measures (PSS-10, symptom-free status and QALYs) from a societal perspective. There is a 70%, 70% and 69% probability that the iSMI dominates WLC for the 3 defined outcomes, respectively. The overall conclusion of the study did not change when assumptions were explored in sensitivity analyses. The author comments that conclusions of the long-term effects cannot be made due to the 6-month time horizon and that the generalizability of the study findings may be limited due to the self-selection of participants. The economic analysis was conducted alongside the same randomised controlled trial (RCT) used in Ebert (2018). The analysis was assessed as partly application to the review question, with minor limitations.
- Phillips (2014) found the MoodGYM intervention, an interactive computerized cognitive behavioural therapy to improve employees' work-related performance and psychological well-being, resulted in slightly lower costs and a slightly lower QALY gain compared with an 'attentional' control at 6-week follow-up. At 6-week follow-up the total QALYs gained were 0.082 for the MoodGYM group and 0.083 for the control group and estimated mean costs per person were £125 for the MoodGYM group and £149 for the control group. At 12-week follow-up the total QALYs gained was 0.170 for the MoodGYM group and 0.167 for the control group. However, 12-week costs were not reported. The author notes that the most serious limitations of the study are the low retention rate (likely due to no face-to-face interaction between participants and the research team) and the short follow-up period that make it difficult to comment on the full effects of the intervention over time. Sensitivity analyses were not explored. The analysis was assessed as directly application to the review question, with minor limitations.

- De novo economic modelling was undertaken for this guideline. The cost-consequences analysis demonstrated scenarios in which mental health interventions are cost saving and scenarios in which they are not. The results depended on a myriad of factors and, as such, the analysis could not produce generalisable results. The model is intended to be used by decision makers to generate bespoke results, specific to their workplace. The analysis was assessed as directly applicable and with minor limitations.

## 1.1.11 The committee's discussion and interpretation of the evidence

### 1.1.12.1 The outcomes that matter most

The committee prioritised employee outcomes for decision-making purposes over outcomes of interest to employers but agreed that employer outcomes were important in terms of cost effectiveness. Outcomes in the employee category included mental wellbeing, job stress and symptoms of employee mental health, for example depression and anxiety. The committee agreed that outcomes at longest follow up in each study were preferred as the committee was interested to see the sustainability of the targeted interventions and any impact on inequalities as regards low-income groups. The committee noted that there was limited evidence for some of the outcomes of interest to them such as job satisfaction. The committee were also interested in any barriers and facilitators, and the acceptability of interventions to employees and employers.

### 1.1.12.2 The quality of the evidence

***Quantitative evidence***

The evidence came from 35 RCTs and 2 non-randomised controlled trials. According to GRADE, the quality of the evidence ranged from moderate to very low with roughly half of the evidence graded as moderate. The main reasons for downgrading were concerns of risk of bias (due to the use of self-reported outcomes), inconsistency (percentage of heterogeneity ≥50%), and imprecision (the confidence intervals of the pooled studies crossed the line of no effect).

The committee discussed the evidence and noticed that studies were carried out in 17 different countries (UK, Germany, Sweden, Japan, Brazil, USA, The Netherlands, Australia, Spain, Italy, Hong Kong, China, New Zealand, India, South Korea, Finland, and Poland) and recognised that the culture towards employee wellbeing in these countries may be different. They noted that in many ways the UK was most similar to the US, with workers in Europe having better rights. The committee also noted that the studies were carried out in both the private and public sectors. Around half of the studies did not report the size of the organisation in which they were delivered. Of those that did, all except one were delivered in large organisations. This was of concern as it mitigated the ability to generalise the finding to small and medium sized organisations. Details on the seniority of the participants or their contract type was also reported sparsely which limited the ability of the committee to interpret the identified evidence within context. The committee also queried the relevance of some of the interventions reviewed, for example, auriculotherapy or expressive writing, as these are not commonly used in the UK.

The majority of the interventions were short in duration, up to 8 sessions. The majority were delivered online or remotely, but there were some exceptions, for example mindfulness which were delivered face-to-face. The committee acknowledged that online or remotely delivered interventions are attractive as they can be regarded as a quick solution for staff who have stress or mental wellbeing concerns. However, the committee were concerned that when delivered remotely and as a sole intervention, they did not afford an opportunity to change the working environment or culture which may be the source of/underlying the symptom, nor to agree or provide ongoing support for the future.

The length of follow-up after the intervention was also a concern of the committee as many of the studies did not follow-up after the intervention ended and if they did it was generally no more than 3 months after the intervention ended. The committee would have liked to have evidence of the longer-term effectiveness of these interventions.

The committee, taking into account the quality of the evidence, acknowledged that there was evidence of the effectiveness of some of the targeted interventions identified in the review especially in relation to employee outcomes, such as mental wellbeing, job stress and mental health symptoms.

The committee noted several gaps in the evidence for some outcomes including adverse effects or unintended consequences. The committee noted that there was a lack of detail on socioeconomic status, income level and location in terms of remote working in the description of the populations of the included studies.

***Qualitative evidence***

One UK study contributed to the qualitative findings. This study focused on the views of the employees with elevated stress levels who took part in an online CBT-based mental health programme. The study had poor follow-up rates and poor adherence to the intervention, however, the committee did accept the findings of the study The committee agreed that the identified barriers and facilitators were generalisable to the private sector. This is because lack of time is a key issue in both sectors and senior management buy-in and support is needed to facilitate employee access to these interventions.

#### 1.1.12.3 Benefits and harms

6 RCTs reported on the use of CBT in a targeted population, where the intervention was delivered either digitally (5 studies), or over the telephone (1 study). Low quality evidence indicated that CBT may be effective in improving mental wellbeing and mental health symptoms, and moderate quality evidence indicated that CBT reduces presenteeism. However, low quality evidence showed no benefit for the outcomes of productivity, absenteeism, or mental health literacy, and very low-quality evidence showed no benefit to the outcomes of job stress or absenteeism.

Only one qualitative study was identified which was concerned with digital CBT with or without an additional discussion group, in individuals with elevated stress levels. This identified facilitators and barriers to the implementation of the intervention, as well as the views of those who took part. Important themes were identified, including that staff liked the content and how it was delivered online. There were mixed views on the practicality of delivering an online intervention in the workplace where privacy and confidentiality would have to be ensured for example, in an open plan workplace such as an office or a factory floor and concerns over having time to engage with the intervention.

This evidence is consistent with the committee's experience, as clients reported liking the flexibility of online sessions being available all the time, and they also liked the short nature of the support, usually no more than 8 sessions. However, the committee did have concerns over the lack of evidence for face-to-face CBT as there is a degree of variability over how these are delivered, group or individual, and there is also some variability in the quality of the counsellors. The committee also accepted that there are concerns over the generic nature of online interventions and also accepted that a 'one size fits all approach' probably does not work. The committee discussed that the key barrier to uptake (lack of time to take part) was a key consideration and they agreed that if dedicated time was allowed to support interventions, then the impact of the intervention might be greater. The committee recognised that senior management buy-in and support for the intervention empowered staff to take part as this was consistent with their experience. The committee considered that targeted interventions should be delivered in the context of a whole workplace approach which is both positive and supportive [rec 1.2.1]. Overall, based on the evidence, and committee

experience, the committee drafted a recommendation for CBT sessions in people with poor mental health [rec 1.7.4]. As the committee did not want to specify the format and nature of the CBT, they were minded to write a recommendation around CBT sessions that could be delivered in any format.

5 RCTs reported on the use of mindfulness in a targeted population. Moderate quality evidence indicated that mindfulness is effective in improving mental wellbeing, mental health symptoms, and absenteeism in a targeted population, and very low-quality evidence suggested that mindfulness may improve job stress in a targeted population. The committee did note that some interventions have contra-indications for example, mindfulness is contra-indicated for PTSD symptoms, but agreed that these are rare. As the evidence supported the use of mindfulness, the committee recommended it as an option for people with poor mental health [rec 1.7.4].

5 RCTs reported on the use of stress management in a targeted population. Moderate quality evidence indicated that stress management was effective in improving job satisfaction, quality of life, and mental health literacy in a targeted population. Low and very low-quality evidence indicated that stress management may improve job stress and mental health symptoms in a targeted population respectively. However, there was low quality evidence that stress management did not improve absenteeism and presenteeism in a targeted population. As the evidence indicated that stress management is effective in improving employee outcomes, the committee recommended stress management as an option for people with poor mental health [rec 1.7.4].

The committee discussed the average duration of the interventions was up to 8 sessions and also acknowledged that workload and time pressure of employees, was the main barrier for low adherence as reported in the qualitative study. The committee recognised that the interventions, as used in the studies, shown to be effective were, except for mindfulness, mostly delivered remotely or with minimal professional support and therefore could be regarded as a form of self-help interventions. The committee wanted to distinguish between interventions delivered remotely with minimal professional support including mindfulness and those variations delivered with full professional support, as the relationship between the therapist and client is key in face-to-face sessions. However, given the waiting list for face-to-face sessions the committee agreed that self-help style interventions do have a place in the current healthcare landscape.

There was very low to moderate quality evidence that indicated some positive effects on outcomes in several interventions including: problem solving, acceptance and commitment therapy, auriculotherapy, internet sleep recovery, positive psychotherapy, massage therapy, occupational health consultation, accelerated recovery, preventive coaching, web-guided self-help, individualised mailed advice, brief education, expressive writing, combined CBT and problem solving, and combined CBT and complementary alternative therapy. However, evidence for these interventions was only derived from 1 or 2 studies, and therefore the committee were unsure about the generalisability of the findings. Consequently, the committee did not draft any recommendations around these interventions. There was also very low to moderate quality evidence around several interventions that did not indicate any positive effects on any of the outcomes measured including: combined CBT and discussion group, stress management stress management combined with coping skills, imagery, physical therapy, medical counselling, and affect school. Due to a lack of evidence showing any effectiveness, the committee did not draft any recommendations around these interventions.

The committee acknowledged the complexity of the mental wellbeing interventions discussed and agreed that wider factors, including wider organisational and individual factors, should also be considered. They further explained that these interventions will probably have no lasting impact on employee outcomes, if there were no consequential changes to working arrangements and other elements of work such as, poorly designed jobs or job insecurity.

The committee further stressed that a whole workplace approach to mental wellbeing at work was needed. The committee discussed the practical limitations to research on employees' personal issues and circumstances. They acknowledged, based on their experience, that flexible working policies and living wages were important factors that affected mental wellbeing in general and also in the workplace. The committee also discussed that wellness action plans can be used to open a dialogue between managers and employees and allow sources of support to be identified, so that employers can recognise and offer organisational support to employees that have poor mental wellbeing, or are at risk of poor mental wellbeing [rec 1.7.2].

Expert testimony also highlighted that many small and medium business owners are at high risk of poor mental wellbeing and exhaustion, and that this has been exacerbated by COVID-19. Therefore, the committee drafted a recommendation for SMEs that leaders and business owners should address their own mental health needs [rec 1.11.1].

The committee also emphasized that it is the employee's individual choice to take up an intervention and the employer's/manager's role to signpost/make referrals where appropriate [rec 1.7.3]. It was also accepted that an individual may take up an intervention confidentially and the employer may not then be aware that they have done so. The committee considered that employers and managers can provide an environment where employees are more likely to accept an intervention if it is offered. This includes making employees aware that they can stop an intervention at any time and restart the intervention if they would like to do so [rec 1.7.5]. The committee were concerned that managers could face difficulties relating to confidentiality if they feel that an employee is at risk of harming themselves or someone else. To address this and ensure that additional burden is not placed on managers, the committee made recommendations that organisations should have clear policies in relation to confidentiality [recs 1.2.2 and 1.7.1].

#### 1.1.12.4 Cost effectiveness and resource use

The committee discussed evidence from 5 published studies on the cost effectiveness of targeted individual level interventions for employees who are experiencing or who are identified as being at risk of poor mental wellbeing.

The committee noted the studies were carried out in different countries (1 in Australia, 2 in Germany, 1 in the Netherlands and 1 in the United Kingdom) which led them to question the generalisability of the findings. They also noted the studies covered a range of interventions (internet-based stress management, computerised CBT, telephone support and web-based CBT with a problem solving focus) and targeted different populations which again limits the generalisability of the findings.

The study by Phillips (2014) was a randomized controlled trial of computerized cognitive behavioural therapy for depressive symptoms. The results showed the intervention had slightly lower costs and a slightly lower QALY gain compared with the control group that were sent weekly links to 5 websites with general information about mental health. . The committee noted it had a low retention rate (likely due to no face-to-face interaction between participants and the research team) and the short follow-up period made it difficult to comment on the full effects of the intervention over time. They noted QALY gains were reported at two follow up periods - 6 weeks and 12 weeks - but costs were reported only at 6 weeks which made it difficult to interpret the economic results. They also noted there were no sensitivity analyses.

The study by Callander (2017) was a cost benefit analysis conducted alongside an RCT of the WORC intervention which comprised a single, one hour telephone call from a psychologist. The study adopted a 12-month time horizon and employer perspective. The results showed the intervention was cost effective - it increased the productivity of employees with depressive symptoms and the costs of intervening were offset by the value of the

productivity gains. The committee noted the benefits were limited to productivity and sensitivity analyses were not undertaken.

The study by Ebert (2018) was a cost-benefit (CBA) and cost-effectiveness analysis (CEA) conducted alongside an RCT of an internet-based stress management intervention. The study adopted a 6-month time horizon and employer perspective. The results showed the intervention was cost effective compared with a waitlist control group in a population with elevated symptoms of perceived stress. However, the results are uncertain and depends on the willingness to pay. A sensitivity analysis found a 67% probability that the intervention generates better outcomes at lower costs compared to the control at a willingness-to-pay ceiling of €0 for one additional symptom free employee. If the willingness to pay increases, it would become more cost-effective. The committee noted the RCT was underpowered for the economic analysis and that the generalizability of the study findings may be limited due to the population including only those who were severely distressed and who were willing to use the intervention. They also noted that including additional work-related costs (such as staff turnover) might affect the results and make it more cost-effective.

The study by Kahlke (2019) was a cost utility analysis (CUA) and CEA conducted alongside an RCT of an internet-based stress management intervention. The study adopted a 6-month time horizon and societal perspective. Compared with the waiting list control, the results showed the intervention was cost effective (dominant) – it was less costly and generated better outcomes for all three outcomes – perceived stress, symptom free status and quality adjusted life years. With a willingness to pay of €0 to get an additional symptom-free person there was a 70% probability that the intervention is more cost-effective than the waitlist control group. The committee noted the study was essentially the same as Ebert (2018) as they both drew on the same RCT. They agreed the study was limited by the short time horizon which prevented any long-term conclusions being drawn and that self-reporting of costs and effects might have led to social desirability and/or recall bias. They also noted the majority of the sample were female which limits the generalisability of the findings. The committee noted the reviewers had identified some inconsistencies in the figures that were reported which were not clearly explained and that this study evaluated the same intervention as that reported by Ebert (2018).

The study by Geraedts (2015) was a CBA and CEA conducted alongside an RCT of a web-based guided self-help intervention for employees with depressive symptoms. The study adopted a 12-month time horizon from an employer and a societal perspective. At 12 months, a significant intervention effect on depressive symptoms was found. At a willingness to pay of 0 (€/unit of effect), the intervention's probabilities of cost-effectiveness were 62% from a societal perspective and 55% from an employer's perspective indicating some uncertainty in the cost effectiveness. There was a 63% probability that the intervention resulted in a positive financial return for the employer. The authors concluded that the intervention's cost-effectiveness with regard to depressive symptoms depends on the willingness to pay of societal and company decision makers, as well as the probability of cost-effectiveness that they consider acceptable. The intervention is not cost-saving to the employer. The committee agreed that the short time horizon may not have captured the full effects of the intervention and as other work-related costs such as staff turnover were not included the study may have underestimated the greater cost savings from an employers' perspective.

Overall, the committee thought the findings were consistent in showing that interventions were cost-effective and, in some cases, actually dominant (i.e. cheaper and more effective) despite a variety of interventions, populations, cost-perspectives and follow-up. They noted limitations in all and had questions about generalisability.

The committee noted the bespoke economic analysis supported these findings indicating that interventions in the workplace could be cost saving over a one-year time horizon. They also noted the findings of multiple sensitivity analyses showed the results varied by key model

inputs such as the cost and effectiveness of the intervention as well as the cost of absenteeism, presenteeism and staff turnover.

The committee observed that employee outcomes could be positive or negative or a combination of the two. For positive outcomes they considered the model may have under-estimated the overall benefits whereas for negative outcomes it may have overestimated the total benefit. In addition, they were mindful that some negative outcomes can be difficult to interpret e.g. an increase in incidence might indicate an improvement in the organisational environment where employees are able to discuss issues and seek help without judgement. Nevertheless, the committee believed it crucially important for employers to take account of any potential adverse consequences in deciding whether to fund an intervention. Further, they highlighted that employers have a legal duty to properly address mental health issues – that is to promote mental wellbeing and prevent ill mental health.

1.1.12.5 Other factors the committee took into account

***Considerations on COVID-19 and lockdown***

The committee discussed the impact of COVID-19 and the subsequent lockdown on the evidence and agreed that working arrangements have changed dramatically. The committee were mindful that the new ways of working had positive impacts for some people and negative for others. The committee acknowledged that different groups, for example, health and social care professionals, those now working from home and those unable to work from home will have been affected differently by the coronavirus pandemic and also noted that health inequalities have been highlighted and exacerbated by the pandemic and restrictions related to lockdown. For example, those in higher income occupations may have had the opportunity to work from home, whereas those in low-income occupations may not have this option and so have an increased risk of infection as a result. These same groups may also have other risk factors for negative outcomes of COVID-19 as subgroups such as those from BAME backgrounds, those living in deprived areas, those living in over-crowded accommodation, will also increase the risk of poorer mental wellbeing at work.

Given the impact that COVID-19 has had on how work is organised, the committee re-emphasised that organisational culture and environment is key to delivering interventions to support those individuals who have or are at risk of poor mental wellbeing. The committee were also mindful of the new challenges in supporting staff members and also the added complexity involved in delivered interventions to support staff in a safe 'socially distant' way,

The committee also acknowledged that all organisations had to change working practices to take account of social distancing and health and safety concerns and referred to guidance and advice from a variety of sources, such as Public Health England and the Health and Safety Executive.

The committee agreed that it was important to distinguish between interventions that were individually tailored and delivered by a therapist and those that were pre-designed self -help online modules. The committee also noted that many interventions that were previously delivered face -to- face were now being delivered remotely, due to the pandemic. However, they noted that in terms of managing the symptoms of poor mental health and in the context of waiting lists for face-to-face interventions, it was appropriate to recommend these interventions.

## 1.1.12 Recommendations supported by this evidence review

This evidence review supports recommendations 1.2.1 – 1.2.2, 1.7.1 – 1.7.5, 1.11.1, and the research recommendation on Individual-level interventions, Approaches for micro, small and medium enterprises, Addressing study reporting and Needs of different employee groups. Other evidence supporting these recommendations can be found in the evidence reviews: organisational universal level approaches: Review A; universal approaches for managers:

Review B; targeted organisational level approaches: Review C; individual universal approaches: Review D; and barriers and facilitators to the implementation and delivery of interventions to improve and protect mental wellbeing at work: Review F.

## 1.1.13 References – included studies

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#### 1.1.13.3 Economic

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# Appendices

## Appendix A – Review protocols

**Review protocol for targeted individual approaches**

| ID | Field | Content |
|---|---|---|
| 0. | PROSPERO registration number | CRD42020178815 |
| 1. | Review title (50 Words) | Workplace individual-level interventions targeted to employees who experience or who are identified as being at risk of poor mental wellbeing |
| 2. | Review question (250 words) | Quantitative<br>What individual-level interventions targeted to employees who experience, or are identified as being at risk of, poor mental wellbeing at work are effective and cost effective for:<br>• promoting positive mental wellbeing?<br>• improving mental wellbeing?<br>• preventing poor mental wellbeing?<br>Qualitative<br>For the following groups in relation to individual-level targeted interventions, what are their views and experiences of what and why certain approaches may or may not work, and how it could be improved:<br>• those receiving them?<br>• employers?<br>• those delivering them? |
| 3. | Objective<br><br>NB – this section does not appear in the submission on the Prospero system | Quantitative<br>To identify what interventions delivered at an individual level and targeted to employees who experience, or who are identified as being at risk of, poor mental wellbeing are effective for:<br>• promoting positive mental wellbeing<br>• improving mental wellbeing<br>• preventing poor mental wellbeing? |

| ID | Field | Content |
|---|---|---|
| | | Qualitative<br>To understand the views and experiences (including acceptability of and barriers & facilitators to) of interventions delivered at an individual level and targeted to employees who experience, or who are identified as being at risk of, poor mental wellbeing.<br><br>Quantitative and qualitative<br>To examine whether effectiveness and cost-effectiveness of interventions varies according to a range of factors including how the intervention is delivered and by whom, the study population, and the nature of the organisation. |
| 4. | Searches (300 words) | The following databases will be searched:<br><br>• Cochrane Central Register of Controlled Trials (CENTRAL)<br>• Cochrane Database of Systematic Reviews (CDSR)<br>• Embase<br>• MEDLINE<br>• Psycinfo<br>• Econlit<br>• Epistemonikos<br>• ASSIA<br>• HealthEvidence.org<br><br>Search strategies will be adapted to take account of the limitations of each database.<br><br>The same search strategy will be used for questions 1-5 for this guideline, with all retrieved studies potentially being includable in each review.<br><br>Searches will be limited by the use of |

| ID | Field | Content |
|---|---|---|
| | | validated filters as follows:<br>○ Date : Studies published from 2007 to present (though included studies from the previous NICE guideline, PH22, will also be considered for inclusion)<br>○ Language : English language<br>○ Study design : RCT filter<br>Search strategies<br>○ OECD countries plus Brazil, China, Russia, India and South Africa<br>○ Non-randomised controlled studies<br><br>Searches will exclude the following publication types:<br>• Editorials<br>• news articles<br>• Letters<br>• Conference abstracts<br>• "Notes"<br>• Other non-research publications<br><br>Other searches:<br>Forwards and backwards citation searching will be carried out in Web of Science using any included studies or relevant systematic reviews as a starting point.<br><br>The What Works Wellbeing and Department for Work and Pensions research reports websites will also browsed for relevant evidence<br><br>The searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion.<br>The full search strategies for MEDLINE database will be published in the final review. |
| 5. | Condition or domain being studied (200 words) | Mental wellbeing in the workplace |

| ID | Field | Content |
|---|---|---|
| | | |
| 6. | Population (200 words) | Inclusion:<br>Quantitative and Qualitative<br>Employees who are:<br>• Experiencing poor mental wellbeing (self-identified or identified using objective measures and/ or validated self-report measures)<br>• Identified as being at risk of experiencing poor mental wellbeing (due to factors at work or outside of work)<br><br>Studies will be eligible where participants include those who are aged 16 years or older in full or part time employment including:<br>• those on permanent, training, temporary or zero hours contracts<br>• those who are self-employed<br>• those who are volunteers<br><br>Qualitative only<br>• employers, managers<br>• those delivering the interventions<br><br>Exclusion:<br>• Quantitative and qualitative<br>• People who are not employed<br>• Prisoners who engage in work activities<br>• Inpatients in mental health institutions who engage in work activities<br>• Military personnel<br>• People not identified as being at risk of, or experiencing, poor mental wellbeing |
| 7. | Intervention/Exposure/Test (200 words) | • Inclusion: |

| ID | Field | Content |
|---|---|---|
| | | • Quantitative and Qualitative<br>• Individual-level approaches delivered to a selected population in addition to usual practice that aim to (one or more of):<br>• improve mental wellbeing<br>• promote positive mental wellbeing<br>• prevent poor mental wellbeing<br>•<br>• This may include approaches such as:<br>• stress management and burnout prevention<br>• workplace adjustments<br>• workload review<br>• signposting to health services or voluntary sector providers for advocacy or representation, support or treatment<br>• self-referral or referral through services such as occupational health or employment assistance programmes for support such as counselling.<br>•<br>• Interventions are eligible that are delivered in a workplace setting, or outside of a workplace where there is employer involvement in the intervention. (Employer involvement may include the initiation, design, delivery, management, funding of, or signposting to, an intervention, including those delivered online or digitally.)<br>•<br>• Exclusion:<br>• Quantitative and qualitative<br>• Interventions that are universally available for all employees regardless of their mental wellbeing status<br>• Therapy-based interventions for clinically diagnosed mental health conditions<br>• Interventions that are part of a return-to-work programme or aimed at employees on a long-term sickness absence<br>• Physical activity interventions that do not include mental wellbeing as a primary outcome |

| ID | Field | Content |
|---|---|---|
| | | • Interventions delivered outside of work without workplace involvement or collaboration. |
| 8. | Comparator/Reference standard/Confounding factors (200 words) | Quantitative<br>• Usual practice (this may be called a control group or waiting list control group or other terms in the individual studies)<br><br>Qualitative<br>Not applicable |
| 9. | Types of study to be included (150 words) | Inclusion:<br>Quantitative<br>Effectiveness studies that include one or more intervention and comparison groups including:<br>• Systematic reviews (published in 2019 or 2020 to ensure currency)<br>• Randomised controlled trials<br>• Non-randomised comparative studies.<br>Qualitative<br>• Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies will also be included provided they contain relevant qualitative data<br><br>Exclusion:<br>Quantitative<br>• Correlation studies<br>• Cross-sectional surveys<br>• Case studies<br>• Single-arm studies |
| 10. | Other exclusion criteria | Quantitative and Qualitative |

| ID | Field | Content |
|---|---|---|
| | | • Papers published in languages other than English<br>• Studies not published in full (e.g. study protocols where no results are published, summary articles)<br>• Studies published before 2007 will be excluded, except studies that were included in the previous NICE guideline PH22<br><br>Quantitative only<br>• Studies carried out in non-OECD and non-BRICS countries<br><br>Qualitative only<br>• Studies conducted outside the UK |
| 11. | Context (250 words) | Since NICE guideline PH22 Mental wellbeing at work was published in 2009, the nature of the workforce has changed in the UK. Increasing amounts of employees are on part-time, temporary or zero-hours contracts. The variations between workplaces and differences in the nature of employment are important to consider when looking at approaches to improve and protect employee mental wellbeing.<br><br>Since 2009 there has been increasing recognition of mental wellbeing and how it is associated with the workplace and work outcomes. Experiences in the workplace can affect mental wellbeing positively and negatively.<br><br>Good employee mental wellbeing is positive for employees and their employers. For example, better mental wellbeing and job satisfaction are associated with increased workplace performance and productivity.<br><br>Poorer mental wellbeing however is associated with increased absenteeism and presenteeism and lost output costs the economy upwards of £74 billion annually. |

| ID | Field | Content |
|---|---|---|
| | | It is therefore important to implement interventions in the workplace to promote and improve mental wellbeing, and to prevent poor mental wellbeing amongst the workforce. |
| 12. | Primary outcomes (critical outcomes) (200 words) | Quantitative<br>Employee outcomes<br>• Any measure of mental wellbeing (using objective measures and/ or validated self-report measures)<br>• Job stress, burnout or fatigue (using objective measures and/ or validated self-report measures)<br>• Symptoms of mental health conditions such as depression, anxiety, insomnia (using validated self-report measures)<br>• Absenteeism<br>• Presenteeism<br>• Productivity<br>• Job satisfaction, engagement or motivation<br>• Uptake of support services<br>• Quality of life<br><br>Employer outcomes<br>• Productivity<br>• Absenteeism<br>• Presenteeism<br><br>Qualitative<br>Eligible studies will include as outcomes the views and experiences of:<br>• Employees receiving the interventions<br>• Employers<br>• Those delivering the interventions |
| 12a | Timing | Timing and measures: |

| ID | Field | Content |
|---|---|---|
| | | Quantitative<br>We will consider outcomes at any follow up. Priority will be given to the longest follow up time for an outcome.<br><br>For interventions with a defined period of delivery (for example a training programme), the follow up period refers to the length of time since the delivery of the intervention was completed.<br><br>For ongoing interventions with no specific completion point (for example the implementation of a new policy), the follow up period refers to the length of time since the intervention was implemented.<br><br>Qualitative<br>We will consider outcomes at any time point following implementation. |
| 13. | Secondary outcomes (important outcomes) (200 words) | Quantitative<br>• Patient and public safety<br>• Employee retention<br>• Mental health literacy, such as knowledge and awareness about mental wellbeing<br>• Unintended consequences or adverse effects<br><br>Qualitative<br>Not applicable |
| 14. | Data extraction (selection and coding) (300 words) | All references identified by the searches and from other sources will be uploaded into EPPI-R5 and de-duplicated.<br><br>This review will use the EPPI-R5 priority screening functionality. At least 60%-70% of the identified abstracts will be screened. After this point, screening will only be terminated if a pre-specified threshold is met for a number of abstracts being screened without a single new include being identified. This threshold is set according to the expected proportion of |

| ID | Field | Content |
|---|---|---|
| | | includes in the review (with reviews with a lower proportion of includes needing a higher number of papers without an identified study to justify termination) and is always a minimum of 250.<br><br>A random 10% sample of the studies remaining in the database when the threshold is met will be additionally screened, to check if a substantial number of relevant studies are not being correctly classified by the algorithm, with the full database being screened if concerns are identified.<br><br>10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer.<br><br>The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above.<br><br>A standardised EPPI-R5 template will be used when extracting data from studies (this is consistent with the Developing NICE guidelines: the manual section 6.4). Details of the intervention will be extracted using the TIDieR checklist in EPPI-R5.<br><br>Outcome data will be extracted into EPPI-R5 as reported in the full text. Where appropriate, outcomes will be transformed from “as reported“ into data we can use in the meta-analysis<br><br>Study investigators may be contacted for missing data where time and resources allow. |
| 15. | Risk of bias (quality) assessment (200 words) | Risk of bias will be assessed using the appropriate preferred checklist as described in Developing NICE guidelines: the manual.<br><br>Quantitative<br>For systematic reviews, we will use the ROBIS tool<br>For randomised controlled trials we will use Cochrane Risk of Bias Tool 2.0.<br>For non- randomised controlled trials we will use the ROBINS-I tool |

| ID | Field | Content |
|---|---|---|
| | | Qualitative<br>For qualitative studies we will use the CASP qualitative checklist |
| 16. | Strategy for data synthesis (300 words) | Quantitative<br><br>Studies will be grouped according to the type of intervention as appropriate.<br><br>Where appropriate, meta-analysis will be used and data will be pooled within the categories above using a random effects model to allow for the anticipated heterogeneity.<br>• Dichotomous data will be pooled where appropriate and the effect size will be reported using risk ratios in a standard pair-wise meta-analysis.<br>• Continuous outcomes reported on the same scale will be pooled in a standard pair-wise meta-analysis using mean difference where possible.<br>• Continuous outcomes not reported on the same scale will be pooled using a standardised mean difference in a standard pair-wise meta-analysis.<br><br>Methods for pooling cluster randomised controlled trials will be considered where appropriate. Unit of analysis issues will be dealt with according to the methods outlined in the Cochrane Handbook.<br><br>Unexplained heterogeneity will be examined where appropriate with a sensitivity analysis based on risk of bias.<br><br>Where appropriate, the quality or certainty across all available evidence will be evaluated for each outcome using an the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/<br><br>Qualitative |

| ID | Field | Content |
|---|---|---|
| | | The key themes from the studies will be categorised into themes relevant to the review across all studies using a thematic analysis. Supporting quotations and summaries of data will be included.<br><br>Where possible we will categorise groups views and experiences relating to acceptability into the following categories:<br>• affective attitude (how the participant feels about the intervention)<br>• burden (perceptions about the amount effort required to participate)<br>• perceived effectiveness<br>• ethicality (whether the intervention fits within the participant's value system)<br>• intervention coherence (whether the participant understands the intervention)<br>• opportunity costs for engaging<br>• self-efficacy to participate<br><br>The quality or certainty across all available evidence will be evaluated for each outcome using the GRADE CERQual approach.<br><br>Integration of data<br>As we have included different types of data from different sources as follows:<br>• Quantitative<br>  ○ effectiveness data from intervention studies<br>• Qualitative<br>  ○ Views and experiences data related to interventions<br><br>An inductive convergent segregated approach will be undertaken to combine findings from each review. Where possible qualitative and quantitative data will be integrated using tables.<br><br>Where quantitative and qualitative data comes from |

| ID | Field | Content |
|---|---|---|
| | | the same study, the technical team will present the qualitative analytical themes next to quantitative effectiveness data for the committee to discuss.<br>different studies, the committee will be asked to interpret both sets of finding using a matrix approach for the committee discussion section. |
| 17. | Analysis of sub-groups (250 words) | Quantitative<br>Where evidence allows, subgroup analyses will be conducted. Depending on the evidence available, some or all of the following subgroups will be explored, including:<br>• Gender<br>• Age<br>• Disability or other long-term physical or mental health condition status<br>• Socioeconomic status (e.g. type of industry: manual, semi-skilled, skilled).<br>• Occupational groups or roles at increased risk of poor mental wellbeing<br>• Work sector (voluntary, public, private)<br>• Organisation size (micro, small, medium and large)<br>• Type of employment contract (part-time, temporary, full-time, voluntary, training)<br>• Other groups for consideration listed in the EIA<br><br>Qualitative<br>Not applicable |
| 18. | Type of method of review | • Intervention |
| 19. | Language | English |
| 20. | Country | England |
| 21. | Anticipated or actual start date | [For the purposes of PROSPERO, the date of commencement for the systematic review can be defined as any point after completion of a protocol but before formal screening of the identified studies against the eligibility criteria begins.<br><br>A protocol can be deemed complete after sign-off by the NICE team with responsibility for quality assurance.] |

| ID | Field | Content | | |
|---|---|---|---|---|
| 22. | Anticipated completion date | [Give the date by which the guideline is expected to be published. This field may be edited at any time. All edits will appear in the record audit trail. A brief explanation of the reason for changes should be given in the Revision Notes facility.] | | |
| 23. | Stage of review at time of this submission | Review stage | Started | Completed |
| | | Preliminary searches | ☐ | ☐ |
| | | Piloting of the study selection process | ☐ | ☐ |
| | | Formal screening of search results against eligibility criteria | ☐ | ☐ |
| | | Data extraction | ☐ | ☐ |
| | | Risk of bias (quality) assessment | ☐ | ☐ |
| | | Data analysis | ☐ | ☐ |
| 24. | Named contact | 5a. Named contact<br>Public Health Guideline Development Team<br><br>5b Named contact e-mail<br>[Guideline email]@nice.org.uk<br>[Developer to check with Guideline Coordinator for email address]<br><br>5c Named contact address<br>National Institute for Health and Care Excellence<br>10 Spring Gardens<br>London<br>SW1A 2BU<br><br>5d Named contact phone number<br>+44 (0)300 323 0148 | | |

| ID | Field | Content |
|---|---|---|
| | | 5e Organisational affiliation of the review<br>National Institute for Health and Care Excellence (NICE) and NICE Public Health Guideline Development Team. |
| 25. | Review team members | [Give the title, first name, last name and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong.]<br><br>From the Centre for Guidelines:<br>[Tech lead]<br>[Tech analyst]<br>[Health economist]<br>[Information specialist]<br>[Others] |
| 26. | Funding sources/sponsor | This systematic review is being completed by the Centre for Guidelines which receives funding from NICE. |
| 27. | Conflicts of interest | All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline. |
| 28. | Collaborators | Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. |

| ID | Field | Content |
|---|---|---|
| | | Members of the guideline committee are available on the NICE website: [NICE guideline webpage].<br><br>Or<br><br>Members of the guideline committee are:<br><br>Chair, Name…<br>Name, Role |
| 29. | Other registration details (50 words) | [Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.] |
| 30. | Reference/URL for published protocol | [Give the citation and link for the published protocol, if there is one.] |
| 31. | Dissemination plans | NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as:<br><br>notifying registered stakeholders of publication<br>publicising the guideline through NICE's newsletter and alerts<br>issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.<br><br>[Add in any additional agree dissemination plans.] |
| 32. | Keywords | [Give words or phrases that best describe the review.] |

| ID | Field | Content | |
|---|---|---|---|
| 33. | Details of existing review of same topic by same authors<br>(50 words) | [Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible. NOTE: most NICE reviews will not constitute an update in PROSPERO language. To be an update it needs to be the same review question/search/methodology. If anything has changed it is a new review] | |
| 34. | Current review status | ☐ | Ongoing |
| | | ☐ | Completed but not published |
| | | ☐ | Completed and published |
| | | ☐ | Completed, published and being updated |
| | | ☐ | Discontinued |
| 35.. | Additional information | [Provide any other information the review team feel is relevant to the registration of the review.] | |
| 36. | Details of final publication | https://www.nice.org.uk/ | |

1

2

3

# Appendix B – Literature search strategies

### Database strategies

Searches were run and re-run in Applied Social Science Index and Abstracts (ASSIA), Cochrane Central Register of Controlled Trials (CENTRAL) / Cochrane Database or Systematic Reviews (CDSR), Econlit, Embase, Epistemonikos, HealthEvidence.org, MEDLINE ALL and PsycINFO. Additional website browsing was undertaken (Department for Work & Pensions Research Reports, What Works Wellbeing Centre) with additional Reference harvesting (backwards citation searching) & forward citation searching undertaken. The ASSIA search undertaken is outlined as an example.

**Database name: Applied Social Science Index and Abstracts (ASSIA)**

**Original searches**

| Set# | Searched for | Results |
|---|---|---|
| S3 | ((((MAINSUBJECT.EXACT.EXPLODE("Employment") OR MAINSUBJECT.EXACT("Occupational stress" OR "Occupational stress management" OR "Job satisfaction" OR "Job involvement" OR "Workaholism") OR TI,AB("job satisfaction" OR ((satisfaction OR satisfied OR engaged OR engagement OR motivation OR motivated) NEAR/3 (work OR worker OR workers OR job OR jobs OR workforce OR workplace)))) OR ((MAINSUBJECT.EXACT("Absenteeism" OR "Work behaviour" OR "Job Performance") OR MAINSUBJECT.EXACT.EXPLODE("Wellbeing" OR "Adaptation") OR TI,AB(absenteeism OR presenteeism OR (work NEAR/3 performance) OR (job NEAR/3 performance))) AND (MAINSUBJECT.EXACT("Resilience") OR MAINSUBJECT("Mental Health" OR "Psychological") OR TI,AB("well-being" OR mental OR mentally OR psychology OR psychological OR psychologically OR psychiatry OR psychiatric OR psychiatrically))) OR (TI(wellbeing OR "well-being" OR stress OR burnout OR fatigue OR fatigued OR tired OR tiredness OR depression OR depressed OR anxiety OR insomnia OR sleep OR productivity OR (confidence NOT ("confidence interval" OR "confidence intervals")) OR "self esteem" OR (mental NEAR/9 (literacy OR knowledge OR attitude OR attitudes OR awareness OR communication OR communications OR communicative OR communicativeness OR skill OR skills OR competent OR competency OR competence OR competencies OR competently OR uptake OR "take-up")) OR ("quality of life" OR "quality adjusted life" OR qaly OR qalys OR qald OR qalds OR qale OR qales OR qtime OR qtimes)) AND (MAINSUBJECT.EXACT.EXPLODE("Employment" OR "Employees" OR "Employees" OR "Work" OR "Working Hours" OR "Work commitment" OR "Work values" OR "Occupational health" OR "Jobs" OR "Corporate culture" OR "Work organization" | 9926 |

| | | |
|---|---|---|
| | OR "Professionals" OR "Personnel management" OR "Human resources management" OR "Staffing") OR MAINSUBJECT.EXACT("Labour force" OR "Workplace control" OR "Workplace learning" OR "Workplaces" OR "Working style" OR "Work status" OR "Work-family conflict" OR "Work-leisure conflict" OR "Work-leisure attitudes" OR "Work-school conflict" OR "Work site programmes" OR "Organizational policy" OR "Organizational factors" OR "Organizational environment" OR "Work environment" OR "Organizational models" OR "Organizational structure" OR "Organizational support" OR "Personnel" OR "Manpower planning" OR "Staffing levels" OR "Occupational diseases") OR MAINSUBJECT("Occupational" OR "Employment" OR "Colleagues" OR "Staff") OR TI,AB,PUB(employee OR employees OR employment OR employed OR work OR worker OR workers OR workload OR workloads OR workplace OR workplaces OR worksite OR worksites OR occupational OR job OR jobs OR organisation OR organization OR organisations OR organizations OR organisational OR organizational OR company OR companies OR corporation OR corporations OR personnel OR staff OR staffing OR colleague OR colleagues OR coworker OR coworkers) OR TI,PUB (profession OR professions OR professional OR professionals))) OR ((MAINSUBJECT.EXACT.EXPLODE("Wellbeing" OR "Depression" OR "Anxiety" OR "Sleep" OR "Productivity" OR "Selfesteem") OR MAINSUBJECT.EXACT("Stress" OR "Daily Stress" OR "Critical incident stress" OR "Life Stress" OR "Nervous breakdown" OR "Role stress" OR "Social stress" OR "Traumatic stress" OR "Burnout" OR "Fatigue" OR "Mental fatigue" OR "Anxiety-Depression" OR "Anxiety disorders" OR "Acute Stress disorder" OR "Generalized anxiety disorders" OR "Panic disorders" OR "Sleep problems" OR "Sleep deprivation" OR "Selfconfidence" OR "Selfacceptance" OR "Selfactualization" OR "Selfcongruence" OR "Selfefficacy" OR "Mental health perspectives" OR "Quality adjusted life years" OR "Quality of life") OR TI,AB(wellbeing OR "well-being" OR stress OR burnout OR fatigue OR fatigued OR tired OR tiredness OR depression OR depressed OR anxiety OR insomnia OR sleep OR productivity OR (confidence NOT ("confidence interval" OR "confidence intervals")) OR "self esteem" OR (mental NEAR/9 (literacy OR knowledge OR attitude OR attitudes OR awareness OR communication OR communications OR communicative OR communicativeness OR skill OR skills OR competent OR competency OR competence OR competencies OR competently OR uptake OR "take-up")) OR ("quality of life" OR "quality adjusted life" OR qaly OR qalys OR qald OR qalds OR qale OR qales OR qtime OR qtimes))) AND (TI,PUB(employee OR employees OR employment OR employed OR work OR worker OR workers OR workload OR workloads OR workplace OR | |

| | | |
|---|---|---|
| | workplaces OR worksite OR worksites OR occupational OR job OR jobs OR organisation OR organization OR organisations OR organizations OR organisational OR organizational OR company OR companies OR corporation OR corporations OR personnel OR staff OR staffing OR colleague OR colleagues OR coworker OR coworkers) OR TI,PUB(profession OR professions OR professional OR professionals)))) AND (MAINSUBJECT.EXACT.EXPLODE("Randomized controlled trials") OR MAINSUBJECT.EXACT("Prospective controlled trials" OR "Case controlled studies") OR TI,AB(randomised OR randomized OR intervention OR interventions OR program OR programme OR trial))) AND pd(20070101-20191128)) AND la.exact("ENG") | |
| S4 | (MAINSUBJECT.EXACT.EXPLODE("Personnel management" OR "Human resources management")) OR (TI,AB(manager OR managers OR management OR supervisor OR supervisors OR "team leader" OR "team leaders" OR "team leadership" OR "line leader" OR "line leaders" OR "line leadership")) | 80131 |
| S5 | S3 AND S4 | 1537 |
| S6 | S3 NOT S4 | 8389 |

Notes

1. ProQuest runs together search lines into a single block once they're OR-ed together but the main cluster above (S3) is the equivalent of line 130 in Medline with a publication date limited added.

2. There is a discrepancy between the number of hits returned in ASSIA (line S5 for question 2 and line S6 for the rest of questions 1-5) and the number of references downloaded. The totals in the tables on pages 7 and 8 reflect the number of references downloaded and included in the review. We have had a persistent problem with ProQuest databases whereby we are unable to download entire reference sets and therefore take the pragmatic decision to download what we can and report both totals. The same problem did not reoccur for the rerun searches.

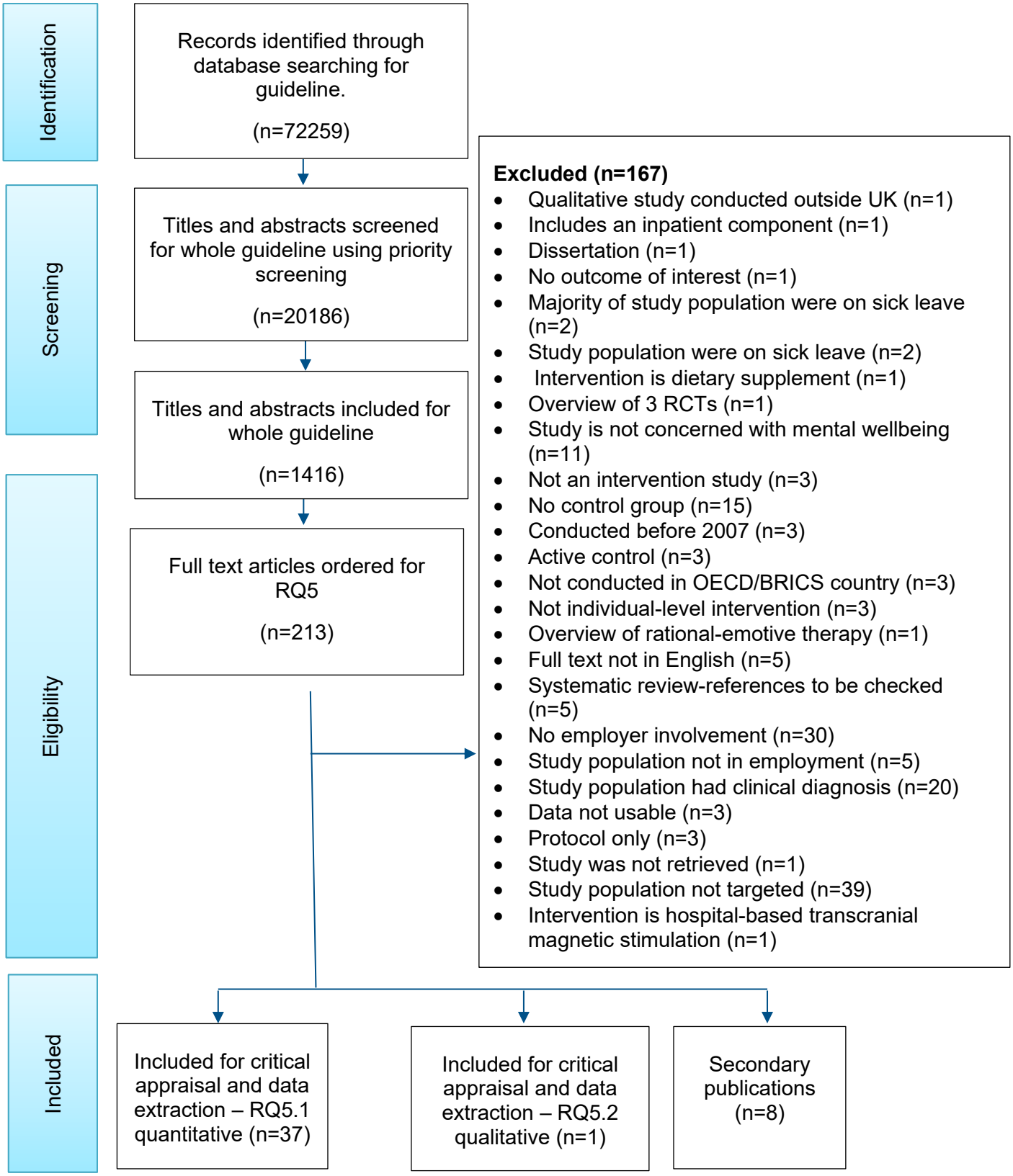
**Rerun searches**

| Set# | Searched for | Results |
|---|---|---|
| S1 | ((((MAINSUBJECT.EXACT.EXPLODE("Employment") OR MAINSUBJECT.EXACT("Occupational stress" OR "Occupational stress management" OR "Job satisfaction" OR "Job involvement" | 3905 |

| | | |
|---|---|---|
| | OR "Workaholism") OR TI,AB("job satisfaction" OR ((satisfaction OR satisfied OR engaged OR engagement OR motivation OR motivated) NEAR/3 (work OR worker OR workers OR job OR jobs OR workforce OR workplace)))) OR ((MAINSUBJECT.EXACT("Absenteeism" OR "Work behaviour" OR "Job Performance") OR MAINSUBJECT.EXACT.EXPLODE("Wellbeing" OR "Adaptation") OR TI,AB(absenteeism OR presenteeism OR (work NEAR/3 performance) OR (job NEAR/3 performance))) AND (MAINSUBJECT.EXACT("Resilience") OR MAINSUBJECT("Mental Health" OR "Psychological") OR TI,AB("well-being" OR mental OR mentally OR psychology OR psychological OR psychologically OR psychiatry OR psychiatric OR psychiatrically))) OR (TI(wellbeing OR "well-being" OR stress OR burnout OR fatigue OR fatigued OR tired OR tiredness OR depression OR depressed OR anxiety OR insomnia OR sleep OR productivity OR (confidence NOT ("confidence interval" OR "confidence intervals")) OR "self esteem" OR (mental NEAR/9 (literacy OR knowledge OR attitude OR attitudes OR awareness OR communication OR communications OR communicative OR communicativeness OR skill OR skills OR competent OR competency OR competence OR competencies OR competently OR uptake OR "take-up")) OR ("quality of life" OR "quality adjusted life" OR qaly OR qalys OR qald OR qalds OR qale OR qales OR qtime OR qtimes)) AND (MAINSUBJECT.EXACT.EXPLODE("Employment" OR "Employees" OR "Employees" OR "Work" OR "Working Hours" OR "Work commitment" OR "Work values" OR "Occupational health" OR "Jobs" OR "Corporate culture" OR "Work organization" OR "Professionals" OR "Personnel management" OR "Human resources management" OR "Staffing") OR MAINSUBJECT.EXACT("Labour force" OR "Workplace control" OR "Workplace learning" OR "Workplaces" OR "Working style" OR "Work status" OR "Work-family conflict" OR "Work-leisure conflict" OR "Work-leisure attitudes" OR "Work-school conflict" OR "Work site programmes" OR "Organizational policy" OR "Organizational factors" OR "Organizational environment" OR "Work environment" OR "Organizational models" OR "Organizational structure" OR "Organizational support" OR "Personnel" OR "Manpower planning" OR "Staffing levels" OR "Occupational diseases") OR MAINSUBJECT("Occupational" OR "Employment" OR "Colleagues" OR "Staff") OR TI,AB,PUB(employee OR employees OR employment OR employed OR work OR worker OR workers OR workload OR workloads OR workplace OR workplaces OR worksite OR worksites OR occupational OR job OR jobs OR organisation OR organization OR organisations OR organizations OR organisational OR organizational OR company OR companies OR corporation OR corporations OR personnel OR staff OR staffing OR colleague OR colleagues OR coworker OR coworkers) OR TI,PUB (profession OR professions OR professional OR professionals))) OR | |

| | | |
|---|---|---|
| | ((MAINSUBJECT.EXACT.EXPLODE("Wellbeing" OR "Depression" OR "Anxiety" OR "Sleep" OR "Productivity" OR "Selfesteem") OR MAINSUBJECT.EXACT("Stress" OR "Daily Stress" OR "Critical incident stress" OR "Life Stress" OR "Nervous breakdown" OR "Role stress" OR "Social stress" OR "Traumatic stress" OR "Burnout" OR "Fatigue" OR "Mental fatigue" OR "Anxiety-Depression" OR "Anxiety disorders" OR "Acute Stress disorder" OR "Generalized anxiety disorders" OR "Panic disorders" OR "Sleep problems" OR "Sleep deprivation" OR "Selfconfidence" OR "Selfacceptance" OR "Selfactualization" OR "Selfcongruence" OR "Selfefficacy" OR "Mental health perspectives" OR "Quality adjusted life years" OR "Quality of life") OR TI,AB(wellbeing OR "well-being" OR stress OR burnout OR fatigue OR fatigued OR tired OR tiredness OR depression OR depressed OR anxiety OR insomnia OR sleep OR productivity OR (confidence NOT ("confidence interval" OR "confidence intervals")) OR "self esteem" OR (mental NEAR/9 (literacy OR knowledge OR attitude OR attitudes OR awareness OR communication OR communications OR communicative OR communicativeness OR skill OR skills OR competent OR competency OR competence OR competencies OR competently OR uptake OR "take-up")) OR ("quality of life" OR "quality adjusted life" OR qaly OR qalys OR qald OR qalds OR qale OR qales OR qtime OR qtimes))) AND (TI,PUB(employee OR employees OR employment OR employed OR work OR worker OR workers OR workload OR workloads OR workplace OR workplaces OR worksite OR worksites OR occupational OR job OR jobs OR organisation OR organization OR organisations OR organizations OR organisational OR organizational OR company OR companies OR corporation OR corporations OR personnel OR staff OR staffing OR colleague OR colleagues OR coworker OR coworkers) OR TI,PUB(profession OR professions OR professional OR professionals)))) AND (MAINSUBJECT.EXACT.EXPLODE("Randomized controlled trials") OR MAINSUBJECT.EXACT("Prospective controlled trials" OR "Case controlled studies") OR TI,AB(randomised OR randomized OR intervention OR interventions OR program OR programme OR trial))) AND ud(20191128-20210201)) AND la.exact("ENG") | |
| S2 | (MAINSUBJECT.EXACT.EXPLODE("Personnel management" OR "Human resources management")) OR (TI,AB(manager OR managers OR management OR supervisor OR supervisors OR "team leader" OR "team leaders" OR "team leadership" OR "line leader" OR "line leaders" OR "line leadership")) | 84384 |
| S3 | S1 AND S2 | 631 |
| S4 | S1 NOT S2 | 3274 |

# Appendix C – Effectiveness evidence study selection



# Appendix D – Effectiveness evidence

## D.1 Bergdahl, 2005

**Bibliographic Reference** Bergdahl, J; Larsson, A; Nilsson, LG; Ahlstrom, KR; Nyberg, L; Treatment of chronic stress in employees: subjective, cognitive and neural correlates.; Scandinavian journal of psychology; 2005; vol. 46 (no. 5); 395-402

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To examine whether a potential intervention effect affected the neural correlates of episodic memory processing. |
| **Country/geographical location** | Sweden |
| **Setting** | • Public sector<br>• Industry - Social services / education<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | A high stress level at both the initial screening and the testing six months later, prior to the intervention. |
| **Exclusion criteria** | None reported |

| | |
|---|---|
| **Method of randomisation** | Not reported |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | No report of a power calculation.<br><br>No information on how missing data were dealt with<br><br>Independent t-tests for between-group comparisons and paired sample t-test for within group comparisons before and after intervention.<br><br>Effect sizes were calculated so that positive value of ES indicated improvement and negative deterioration. The ES-values were interpreted as follows<br><br>• ES > ± 0.20 indicate small,<br>• ES > ± 0.50 moderate, and<br>• ES > ± 0.80 large improvement/deterioration. |
| **Attrition** | Complete data was available for 20 out of 27 (74.1%) in the intervention group and 17 out of 23 (73.9%) of the control group |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Follow-up (5 weeks after intervention) |

| | |
|---|---|
| | Primary outcome was not specified.<br><br>Outcomes were<br><br>• Perceived Stress Questionnaire<br>• Symptom Check List-90<br>• fMRI scanning.(subset only) |
| **Study limitations (author)** | • a relatively small number of participants were included<br>• all participants did not complete all rating forms<br>• an active control group would have helped identify specific treatment effects |
| **Study limitations (reviewer)** | • lack of information on how missing data was dealt with so completer only analysis |
| **Source of funding** | This study was supported by grants from Umea Municipality, Sweden. |

**Study arms**

Affect School (N = 27)

No intervention (N = 23)

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 50)** |
|---|---|
| **Age** (years) | 20 to 62 |

| Characteristic | Study (N = 50) |
|---|---|
| Range | |
| **Female**<br><br>Sample size | n = 50 ; % = 100 |

**Outcomes**

Study timepoints

5 week (data collected 5 weeks after the intervention)

**Employee outcomes**

| Outcome | Affect School, 5 week, N = 27 | No intervention, 5 week, N = 23 |
|---|---|---|
| **Job stress**<br>Reported as effect size on Perceived Stress Questionnaire (PSQ)<br><br>Sample size | n = 20 ; % = 74.1 | n = 17 ; % = 73.9 |
| **Job stress**<br>Reported as effect size on Perceived Stress Questionnaire (PSQ)<br><br>Custom value | 1.16 | 0.26 |
| **Mental health symptoms**<br>Symptom Check List-90 (SCL-90)<br><br>Sample size | n = 20 ; % = 74.1 | n = 17 ; % = 73.9 |
| **Mental health symptoms**<br>Symptom Check List-90 (SCL-90)<br><br>Custom value | 0.47 | 0.11 |

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Affect School vs No intervention (5 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Mental health symptoms - Affect School vs No intervention (5 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

## Study arms

**Affect School (N = 27)**

| | |
|---|---|
| **Brief name** | Affect School [Abstract] |
| **Rationale/theory/Goal** | The goal is to increase affect awareness, and the ability to perceive and express affects in order to improve the ability to cope with stress. It is based on Tomkins affect theory. [P  396] |
| **Materials used** | Manual, handouts, didactic presentations [P 397] |
| **Procedures used** | Each session consisted of three parts: a general topic, a specific affect and a group discussion of a specific affect..<br><br>The intervention started with an introduction of the participants and leaders  as well as a presentation of format, rules and goals of the intervention.<br><br>Handouts for the sessions were distributed to the participants at the beginning of each session. The sessions began with a 30-minute didactic presentation of topics, such as the mechanism of stress reactions and affective scripts. followed by a |

| | |
|---|---|
| | break  In the next step of the session, the participants were asked to remember and present a specific stress-related situation. [P 397] |
| **Provider** | Each group was led by two psychologists [P 396-7] |
| **Method of delivery** | Group sessions [P 397] |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Seven 2-hours sessions over 7 weeks [P 397] |
| **Tailoring/adaptation** | None reported |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Structured Affect-Focussed Training**

No intervention (N = 23)

| | |
|---|---|
| **Brief name** | Control group [Abstract] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |

| | |
|---|---|
| **Procedures used** | The control group received equal attention before and after intervention as the treatment group [P 397] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.2 Birney, 2016

| | |
|---|---|
| **Bibliographic Reference** | Birney, AJ; Gunn, R; Russell, JK; Ary, DV; MoodHacker Mobile Web App With Email for Adults to Self-Manage Mild-to-Moderate Depression: Randomized Controlled Trial.; JMIR mHealth and uHealth; 2016; vol. 4 (no. 1); e8 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |

| | |
|---|---|
| **Trial registration number** | ClinicalTrials.gov NCT02335554 |
| **Study start date** | Aug-2012 |
| **Study end date** | Apr-2013 |
| **Aim** | To evaluate a self-guided intervention, using the "MoodHacker" mobile Web app to activate the use of cognitive behavioural therapy (CBT) skills in working adults with mild-to-moderate depression |
| **Country/geographical location** | USA |
| **Setting** | Workplace<br>• Sector - Not specified<br>• Industry - Not specified<br>• Size - Not specified<br>• Contract - Mixed (Full-time, part-time, self-employed)<br>• Seniority - Not specified |
| **Inclusion criteria** | • 18 years or older;<br>• mild-to-moderate depressive symptoms as measured by the Patient Health Questionnaire-9 (PHQ-9) (score of 10-19);<br>• not currently suicidal or meeting criteria for bipolar or schizoaffective disorder;<br>• employed at least part time; English speaking;<br>• have access to a high-speed Internet connection. |
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | Block randomisation - blocked on race/ethnicity and randomised within block into intervention or control |

| | |
|---|---|
| **Method of allocation concealment** | Research assistants were aware of group assignment, all other interactions with subjects were delivered by emails that were standardized across groups and fully automated to avoid differential interactions by group assignment.<br><br>All other research team members were blinded and, aside from crisis calls, no research team members had direct interaction with subjects after randomisation. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | Statistical power calculations for the analysis of covariance (ANCOVA) indicated that a sample size of 300 yielded sufficient power (>.80) to detect a condition effect of Cohen's d=0.34 or larger (moderately small effect size).<br><br>Univariate effects of intervention condition, EAP access, and their interaction on outcome measures were examined using between-subjects ANCOVA, adjusting for pre-test outcomes.<br><br>All subjects were included in intent-to-treat (ITT) analyses.<br><br>Missing data were accounted for using the single imputation procedure available in SPSS, version 21.0 |
| **Attrition** | 10/150 (6.6%) in the intervention group and 5/150 (3.3%) in the control group did not complete the follow-up assessment. |
| **Assessments and timepoints** | The following assessment were made at these times<br><br>• Baseline<br>• Endpoint (6 weeks after baseline)<br>• Follow-up (4 weeks after endpoint)<br><br>Primary outcome<br><br>• Depressive symptoms using PHQ-9<br><br>Secondary outcomes |

| | |
|---|---|
| | • Behavioral Activation for Depression Scale<br>• Automatic Thoughts Questionnaire-Revised (ATQ-R) scale Short Form<br>• Knowledge<br>• Worker productivity using the Work Limitations Questionnaire (WLQ)<br>• Workplace Outcome Suite<br>• System Usability Scale, |
| **Study limitations (author)** | • Convenience sample (all volunteers) therefore not necessarily representative of the working population;<br>• Self-report measures; Some outcome measures were of moderate reliability which may have attenuated the effect size of the intervention effects found in the study;<br>• Subjects were compensated for completing assessments which may have influenced attrition rates and the study may have had differing completion rates in the absence of compensation;<br>• Attenuation of outcomes at 10-week follow-up suggests a need for more potent activation of CBT-based skills or a need for extended app contacts to drive continued engagement. |
| **Study limitations (reviewer)** | • Allocation concealment and blinding of evaluators was not undertaken although strategies were put into place to mitigate the potential impact of the lack of these processes.<br>• Conflict of interest as principle investigator is employed by the company who developed the MOODHACKER app - this is stated in the paper |
| **Source of funding** | Grant from the US National Institutes of Health, National Institute of Mental Health (R44MH073280). |

**Study arms**

MoodHacker (N = 150)

Light-touch, mobile, Web CBT-based experience as a fully self-guided intervention

Control (N = 150)

E-mail with links to vetted online information about depression

**Characteristics**

**Arm-level characteristics**

| Characteristic | MoodHacker (N = 150) | Control (N = 150) |
|---|---|---|
| **Age**<br>Mean (SD) | 40.6 (11.5) | 40.7 (11.2) |
| **Female**<br>Sample size | n = 112 ; % = 74.6 | n = 118 ; % = 78.7 |
| **Male**<br>Sample size | n = 37 ; % = 24.7 | n = 32 ; % = 21.3 |
| **Asian**<br>Sample size | n = 3 ; % = 2 | n = 6 ; % = 4 |
| **Hawaiian**<br>Sample size | n = 1 ; % = 0.7 | n = 0 ; % = 0 |
| **African-American**<br>Sample size | n = 32 ; % = 21.3 | n = 25 ; % = 16.7 |
| **Caucasian**<br>Sample size | n = 102 ; % = 68 | n = 105 ; % = 70 |
| **Mixed**<br>Sample size | n = 9 ; % = 6 | n = 9 ; % = 6 |
| **Full-time**<br>Sample size | n = 84 ; % = 56 | n = 92 ; % = 61.3 |

| Characteristic | MoodHacker (N = 150) | Control (N = 150) |
|---|---|---|
| **Part-time**<br><br>Sample size | n = 53 ; % = 35.3 | n = 46 ; % = 30.7 |
| **Self-employed**<br><br>Sample size | n = 13 ; % = 8.7 | n = 12 ; % = 8 |

**Outcomes**

**Study timepoints**

- Baseline
- 4 week (follow-up (4 weeks after endpoint and 10 weeks after baseline))

**Employee Outcomes**

| Outcome | MoodHacker , Baseline, N = 150 | MoodHacker , 4 week, N = 150 | Control , Baseline, N = 150 | Control , 4 week, N = 150 |
|---|---|---|---|---|
| **Mental health symptoms**<br>Reported as Depression - using self-reported PHQ-9<br><br>Mean (SD) | 13.2 (4.3) | 8.8 (5.1) | 13.6 (3.8) | 9.5 (5) |
| **Mental health literacy**<br>Reported as Knowledge about depression<br><br>Mean (SD) | 57 (18.3) | 63.3 (18.9) | 60 (15.5) | 63 (16.6) |
| **productivity**<br>Reported using Work Limitations Questionnaire (WLQ) productivity loss<br><br>Mean (SD) | 6 (7.3) | 8.6 (5.3) | 4.6 (6.5) | 9 (5.5) |

| Outcome | MoodHacker , Baseline, N = 150 | MoodHacker , 4 week, N = 150 | Control , Baseline, N = 150 | Control , 4 week, N = 150 |
|---|---|---|---|---|
| **Job stress**<br>Reported using Workplace Outcome Suite (WOS) - Workplace distress<br><br>Mean (SD) | 16.1 (4.8) | 14.3 (5.2) | 15.3 (5) | 14.2 (5.3) |
| **absenteeism**<br>Reported as Workplace Outcome Suite (WOS) Absenteeism<br><br>Mean (SD) | 39.7 (56.8) | 21.7 (40) | 30.9 (38.2) | 21.9 (40.3) |
| **Presenteeism**<br>Reported as Workplace Outcome Suite (WOS) Presenteeism<br><br>Mean (SD) | 18.3 (4.3) | 14.4 (5.6) | 18.2 (4.9) | 15.2 (5.8) |
| **Engagement**<br>Reported as Workplace Outcome Suite (WOS) Engagement<br><br>Mean (SD) | 13.7 (4.7) | 14.4 (4.6) | 14.8 (4.2) | 15.2 (4.5) |

Mental health symptoms - Polarity - Lower values are better

Mental health literacy - Polarity - Higher values are better

productivity - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

absenteeism - Polarity - Lower values are better

Presenteeism - Polarity - Lower values are better

Engagement - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms-- MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Mental health literacy - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Productivity - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Job stress - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Absenteeism - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Presenteeism - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Engagement - MoodHacker vs Control (4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Study arms**

MoodHacker (N = 150)

| | |
|---|---|
| **Brief name** | Web CBT-based experience (MoodHacker) [P 6] |
| **Rationale/theory/Goal** | Based on cognitive-behavioural therapy principles. [P 6] |
| **Materials used** | Online application [P 6] |
| **Procedures used** | Content is sequenced to follow the enhanced CWD approach and delivered through daily emails, in-app messaging, and in the Articles & Videos library.<br><br>Daily emails are sent to engage users in program content, provide sequenced guidance through the learning objectives in the articles and whiteboard-style videos, give tips for getting the most out of MoodHacker, and prompt the user to track their mood and activities daily. P 6] |
| **Provider** | ORCAS, a health innovation and technology company [P 6] |
| **Method of delivery** | Online [P 6] |
| **Setting/location of intervention** | Online from a location of the participants choosing [P 6] |
| **Intensity/duration of the intervention** | 6 weeks [P 6] |
| **Tailoring/adaptation** | No changes were made to the app during the study period [P 6] |

| | |
|---|---|
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Light-touch, mobile, Web CBT-based experience as a fully self-guided intervention**

Control (N = 150)

| | |
|---|---|
| **Brief name** | Alternative care {P 7] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Email with links to vetted online information about depression from Help Guide, the Mayo Clinic, Mental Health America, and the National Institute of Mental Health. [P 7] |
| **Procedures used** | The educational links were emailed after the baseline assessment. Participants in the alternative care group were then given access to the MoodHacker program after the 10-week assessment. [P 7] |
| **Provider** | Not applicable |
| **Method of delivery** | Online [P 7] |
| **Setting/location of intervention** | Not applicable |

| | |
|---|---|
| **Intensity/duration of the intervention** | Participants were encouraged to browse these sites on their own schedule for 6 weeks.[P 7] |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

E-mail with links to vetted online information about depression

## D.3 Bostock, 2016

| | |
|---|---|
| **Bibliographic Reference** | Bostock, Sophie; Luik, Annemarie I; Espie, Colin A; Sleep and Productivity Benefits of Digital Cognitive Behavioral Therapy for Insomnia: A Randomized Controlled Trial Conducted in the Workplace Environment.; Journal of occupational and environmental medicine; 2016; vol. 58 (no. 7); 683-9 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To investigate if dCBT would improve both sleep and workplace performance in a population of employees who reported poor sleep. |

| | |
|---|---|
| **Country/geographical location** | UK |
| **Setting** | Workplace<br>• Private sector<br>• Industry not specified<br>• Large organisation<br>• Full-time contracts<br>• Seniority - not reported<br>• Office based |
| **Inclusion criteria** | • self-identification as having poor sleep.<br>• aged 18 or over<br>• had reliable internet access<br>• able to read and understand English |
| **Exclusion criteria** | • Use of sleep medication for sleep and other health problems as long as they reported their health to be stable. |
| **Method of randomisation** | Simple online randomisation tool |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |

| | |
|---|---|
| **Statistical method(s) used to analyse the data** | The study was planned with 80% power to detect an ES = 0.4, thus requiring a minimum sample of 200 (> 100 per group) at P value less than 0.05.<br><br>Data were analysed using Linear Mixed Models using SPSS.<br><br>Fixed effects included group allocation, time (pre-, posttreatment), with particular interest in the group x time interaction<br><br>Random effects were run to account for between-subject variation. |
| **Attrition** | 98 out of 135 (73%) in the intervention group and 116 out of 135 (86%) completed post-intervention assessment |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Endpoint (8 weeks after baseline)<br><br>Primary outcome<br><br>• Sleep Condition Indicator<br><br>Secondary outcomes<br><br>• Work Productivity and Impairment questionnaire Absenteeism<br>• Work Productivity and Impairment questionnaire Absenteeism<br>• Sleepiness<br>• Generalized Anxiety Disorder-2) |
| **Study limitations (author)** | • did not include formal screening of other sleep disorders so it is possible that some participants may (also) have had other sleep problems.<br>• Control group did not keep a sleep diary.<br>• a larger sample size may have enabled us to test whether or not statistically significant effects might be demonstrable across the full range of daytime outcomes |

| | |
|---|---|
| | • Results, though based on a substantial sample, represent data form a single company and may not be generalizable |
| **Source of funding** | • Big Health (Sleepio) Ltd supports the authors |

**Study arms**

Digital Cognitive Behavioral Therapy (N = 135)

Fully automated and highly interactive, with no human contact; content based on validated CBT manuals is presented by an animated virtual therapist (‘‘The Prof’’) and tailored by the program’s algorithms to each individual’s characteristics, personal goals, sleep diary data, and progress. Further support is provided

Waiting list (N = 135)

Did not receive any intervention or advice. They completed all major assessments for the trial and were offered dCBT upon completion of the post-treatment evaluation

**Characteristics**

**Arm-level characteristics**

| Characteristic | Digital Cognitive Behavioral Therapy (N = 135) | Waiting list (N = 135) |
|---|---|---|
| **Age**<br>Mean (SD) | 33.9 (6.41) | 33.3 (5.59) |
| **Female**<br>Sample size | n = 47 ; % = 34.8 | n = 43 ; % = 31.9 |
| **Male**<br>Sample size | n = 88 ; % = 65.2 | n = 92 ; % = 68.1 |

| Characteristic | Digital Cognitive Behavioral Therapy (N = 135) | Waiting list (N = 135) |
|---|---|---|
| **Full-time**<br>Sample size | n = 131 ; % = 97 | n = 133 ; % = 98.5 |
| **Part-time**<br>Sample size | n = 4 ; % = 3 | n = 2 ; % = 1.5 |

**Outcomes**

**Study timepoints**

**Baseline**

0 week (Endpoint assessment)

**Employee outcome**

| Outcome | Digital Cognitive Behavioral Therapy, Baseline, N = 135 | Digital Cognitive Behavioral Therapy, 0 week, N = 135 | Waiting list, Baseline, N = 135 | Waiting list, 0 week, N = 135 |
|---|---|---|---|---|
| **Mental health symptoms**<br>Insomnia reported as Sleep Condition Indicator<br>Mean (SE) | 4.78 (0.14) | 6.44 (0.16) | 4.72 (0.14) | 5.24 (0.15) |
| **absenteeism**<br>Reported as Work Productivity and Impairment questionnaire - Absenteeism<br>Mean (SE) | 4.16 (0.52) | 2.06 (0.48) | 4.16 (0.62) | 3.93 (0.6) |

| Outcome | Digital Cognitive Behavioral Therapy, Baseline, N = 135 | Digital Cognitive Behavioral Therapy, 0 week, N = 135 | Waiting list, Baseline, N = 135 | Waiting list, 0 week, N = 135 |
|---|---|---|---|---|
| **Presenteeism**<br>Reported as Work Productivity and Impairment questionnaire - Presenteeism<br><br>Mean (SE) | 43.6 (1.87) | 28.2 (2.2) | 40.9 (1.7) | 38.5 (2.07) |

Mental health symptoms - Polarity - Higher values are better

absenteeism - Polarity - Lower values are better

Presenteeism - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Digital Cognitive Behavioral Therapy vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Absenteeism - Digital Cognitive Behavioral Therapy vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Presenteeism - Digital Cognitive Behavioral Therapy vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Study details**

| | |
|---|---|
| **Brief name** | Digital Cognitive Behavioral Therapy |

**Study arms**

Digital Cognitive Behavioral Therapy (N = 135)

| | |
|---|---|
| **Brief name** | Digital Cognitive Behavioral Therapy [P 685] |
| **Rationale/theory/Goal** | Based on cognitive behavioural therapy [P 683] |

| | |
|---|---|
| **Materials used** | Digital program and app [ |
| **Procedures used** | dCBT was delivered using an established program with content based on validated CBT manuals is presented by an animated virtual therapist and tailored by the program's algorithms to each individual's characteristics, personal goals, sleep diary data, and progress. Further support is provided by system-generated email/SMS prompts and access to a post-moderated online community. [P 685] |
| **Provider** | Animated therapist [P 685] |
| **Method of delivery** | Online [P 685] |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | 6 sessions over 8 weeks {Abstract and P 685] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Waiting list (N = 135)**

| | |
|---|---|
| **Brief name** | Waiting list [P 686] |
| **Rationale/theory/Goal** | Not applicable |

| | |
|---|---|
| **Materials used** | Not applicable |
| **Procedures used** | Participants in the waiting list group did not receive any intervention or advice. They completed all major assessments for the trial and were offered dCBT upon completion of the posttreatment evaluation |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.4 Brinkborg, 2011

| | |
|---|---|
| **Bibliographic Reference** | Brinkborg, Hillevi; Michanek, Josefin; Hesser, Hugo; Berglund, Gunilla; Acceptance and commitment therapy for the treatment of stress among social workers: a randomized controlled trial.; Behaviour research and therapy; 2011; vol. 49 (no. 67); 389-98 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | The aim of the present study was to examine the effect of a brief stress management intervention based on the principles of Acceptance and Commitment Therapy (ACT) on stress and general mental health for Swedish social workers. |
| **Country/geographical location** | Sweden |
| **Setting** | Workplace<br>• Public sector<br>• Social care industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • High levels of stress > 25 on Perceived Stress Scale (PSS) |
| **Exclusion criteria** | No exclusion criteria |

| | |
|---|---|
| **Method of randomisation** | The random allocation sequence was generated with a true random-number service by a researcher who was blind to participants' identity and was not otherwise involved in the study. Participants were informed of allocation by email. |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | No report of a power calculation.<br><br>Intention to treat analysis undertaken using the data missing principle of last observation carried forward. Independent t-tests were performed to check for differences in mean score between the groups at baseline.<br><br>Mean differences at post-treatment between the two conditions were analysed with analysis of variance with the pre-treatment score as a covariate (ANCOVA).<br><br>Effect sizes were calculated using the standardized difference in means between treatment and control at post-treatment (Cohen's d), with the pooled standard deviation. |
| **Attrition** | 34/45 (75.6%) in the intervention group and 23/23 (100%) in the control group completed post-treatment assessment. |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Follow-up (2 weeks after intervention had ended)<br><br>Primary outcomes<br><br>• Perceived Stress Scale (PSS)<br>• The General Health Questionnaire (GHQ-12) |

| | |
|---|---|
| | Secondary outcomes<br><br>• Maslach Burnout Inventory (MBI)<br>• Performance-based self-esteem scale<br>• Demand Control Support Questionnaire (DCSQ)<br>• Acceptance and Action Questionnaire (AAQ) |
| **Study limitations (author)** | • Intervention not compared to another active intervention and/or placebo.<br>• No long-term follow-up was included; Last outcome carried forward used to account for missing data may not accurately estimate treatment effects in certain scenarios;<br>• Number of available participants was low and statistical power may be an issue<br>• AAQ used to measure some participant outcomes has not been validated as a psychometric tool; The Swedish version of the ACT-SMI manual utilised in this study differs from other versions (it includes one more session, is extended over a shorter time period and focuses on daily practice) which may limit its transferability. |
| **Study limitations (reviewer)** | • Lack of details regarding the specific process for allocation concealment.<br>• Two therapists were licensed psychologists (A therapists) and two were master level students in psychology (B therapists) which may have impacted the delivery of interventions across study arms |
| **Source of funding** | The authors received no financial support for the research and/or authorship of this article. |

**Study arms**

ACT-SMI (N = 45)

Acceptance and Commitment Therapy - Stress Management Intervention

Waiting list (N = 23)

**Characteristics**

**Study-level characteristics**

| Characteristic | Study (N = 106) |
|---|---|
| **Age**<br>Reported for full sample of both High stress and Low stress RCTs<br><br>Mean (SD) | 44 (11.1) |
| **Female**<br><br>Sample size | n = 94 ; % = 89 |
| **University or college degree**<br><br>Sample size | n = 106 ; % = 100 |

**Outcomes**

**Study timepoints**

**Baseline**

2 week (after endpoint)

**Employee outcomes**

| Outcome | ACT-SMI, Baseline, N = 45 | ACT-SMI, 2 week, N = 45 | Waiting list, Baseline, N = 23 | Waiting list, 2 week, N = 23 |
|---|---|---|---|---|
| **Job stress**<br>Reported as Perceived Stress Scale (PSS)<br><br>Mean (SD) | 31.9 (4.6) | 24.1 (7.9) | 32.4 (6.4) | 29.7 (6.4) |
| **Mental wellbeing**<br>Reported as General Health Questionnaire (GHQ-12) | 14.8 (3.6) | 11.7 (5) | 14.1 (3.5) | 13.4 (4) |

| Outcome | ACT-SMI, Baseline, N = 45 | ACT-SMI, 2 week, N = 45 | Waiting list, Baseline, N = 23 | Waiting list, 2 week, N = 23 |
|---|---|---|---|---|
| Mean (SD) | | | | |
| **job satisfaction**<br>Reported as Acceptance and Action Questionnaire (AAQ)<br><br>Mean (SD) | 27.5 (5.7) | 30.6 (6.7) | 28.4 (6.3) | 31.1 (6.2) |

Job stress - Polarity - Lower values are better

Mental wellbeing - Polarity - Lower values are better

job satisfaction - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Acceptance and Commitment Therapy (ACT-SMI) vs Waiting list (2 weeks follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Job satisfaction - Acceptance and Commitment Therapy (ACT-SMI) vs Waiting list (2 weeks follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Mental wellbeing - Acceptance and Commitment Therapy (ACT-SMI) vs Waiting list (2 weeks follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome measure was self-reported)* |

**Study arms**

ACT-SMI (N = 45)

| | |
|---|---|
| **Brief name** | Acceptance and Commitment Therapy stress management intervention therapy (ACT-SMI) |
| **Rationale/theory/Goal** | ACT-SMI focuses on acceptance of unpleasant internal events rather than on changing or eliminating stressors that give rise to such events. It is based on behavioural principles formalized in Relational Frame Theory [P 390] |
| **Materials used** | Treatment protocol, exercises, homework assignments and daily practice between sessions [P 390] |
| **Procedures used** | Throughout the treatment, metaphors and interactive exercises are used to illustrate key components of the intervention. Each session has a specific theme and follows the same structure. |

| | |
|---|---|
| | Between sessions, the participants complete homework assignments, including physical exercise and mindfulness practice.<br><br>• Theme of session 1 is stress, acceptance and language.<br>• Theme of session 2 is values.<br>• Theme of session 3 is obstacles and flexibility.<br>• Theme of session 4 is compassion and communication, as well as maintenance of change. [P 391] |
| **Provider** | Four therapists (2 licensed psychologists and 2 master level students in psychology) specialised in cognitive behavioural therapy delivered the intervention working in pairs.<br><br>All had completed training in the method and had access to supervision. [P 391 - 2] |
| **Method of delivery** | Not reported |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Four sessions of 3 hours each, provided every other week [P 391] |
| **Tailoring/adaptation** | 1 additional session added [P 390] |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Adherence to the manual was controlled using a checklist after each session. [P 392] |
| **Actual treatment fidelity** | No exceptions to manual were reported [P 392] |

**Waiting list (N = 23**)

| | |
|---|---|
| **Brief name** | Waiting list [ |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Those in the waiting list group were offered the intervention after the final assessment [P 392] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.5 Carolan, 2017

| | |
|---|---|
| **Bibliographic Reference** | Carolan, S; Harris, PR; Greenwood, K; Cavanagh, K; Increasing engagement with an occupational digital stress management program through the use of an online facilitated discussion group: Results of a pilot randomised controlled trial.; Internet interventions; 2017; vol. 10; 1-11 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT02729987 |
| **Study start date** | Mar-2016 |
| **Study end date** | Oct-2016 |
| **Aim** | To compare a minimally supported CBT based digital mental health program (WorkGuru) delivered in the workplace with and without access to a facilitated discussion group with a wait list control group, and to explore whether increased engagement suggests increased effectiveness |
| **Country/geographical location** | UK |
| **Setting** | Workplace<br>• Sector - Not specified<br>• Industry - Not specified<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Mix of senior managers / administrators, professionals, technical / craft, clerical /intermediate occupations |

| | |
|---|---|
| **Inclusion criteria** | Participants who were:<br>• aged 18 or over,<br>• employed by a participating organisation,<br>• willing to engage with a web-based CBT based stress management intervention,<br>• had access to the Internet,<br>• had access to a tablet or computer,<br>• had an elevated level of stress, as demonstrated by a score of ≥20 on the PSS-10 |
| **Exclusion criteria** | No exclusion criteria |
| **Method of randomisation** | On completion of the baseline questionnaire, participants were randomised to one of the three study arms. An allocation schedule was created using a computer generated randomisation sequence (random.org). An independent researcher allocated each group (A, B, or C) as an active condition (with or without a facilitated bulletin board) or the WLC. |
| **Method of allocation concealment** | An independent researcher allocated each group (A, B, or C) as an active condition (with or without a facilitated bulletin board) or the WLC. The study researchers were blind to the group allocation. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | Inferential analyses were conducted using ANCOVA and t-test. Intention-to-treat analysis; Sensitivity analysis undertaken including per-protocol analysis |
| **Attrition** | 16 weeks after randomisation - Discussion group 21/26 (19% attrition); Non discussion group (23/28 (18% attrition); Control 26/28 (7% attrition) |
| **Assessments and timepoints** | The following assessments were made at<br>• T1:- 2 weeks after randomisation (baseline)<br>• T2 - 8 weeks after randomisation (endpoint) |

| | |
|---|---|
| | • T3 - 16 weeks after randomisation (8 week follow-up)<br><br>Primary outcome<br><br>• engagement (measured using the number of logins to the site)<br><br>Secondary outcomes:<br><br>• psychological outcomes: a measure of depression, anxiety and stress (DASS-21)<br>• Wellbeing at work (IWP Multi-Affect Indicator).<br>• client satisfaction (CSQ)<br>• treatment credibility and patient expectancy (CEQ)<br>• system usability<br>• negative effects of treatment,<br>• job autonomy,(Work Design Questionnaire, autonomy subscale)<br>• time perception<br>• Views and experiences<br>• Online Support Group Questionnaire |
| **Study limitations (author)** | • Individual level randomising can increase the potential for contamination between groups;<br>• Pilot study - generalisability to wider population (increased stress and predominantly female);<br>• Targeted sampling (stress) may have impacted reach and uptake;<br>• Measures to assess outcomes have low reliability;<br>• failure in randomisation in the occupational groups could have affected the outcomes;<br>• measures of engagement used confined to measures of exposure |
| **Study limitations (reviewer)** | Principle investigator is also the founder of WorkGuru and has a financial interest; |
| **Source of funding** | Self-funded by principal investigator for their doctoral thesis. |

**Study arms**

WorkGuru + discussion group (DG) (N = 26)

Engagement with a minimally supported CBT based digital mental health program (WorkGuru) delivered in the workplace with a discussion group (DG)

WorkGuru without a discussion group (MSG) (N = 28)

Engagement with a minimally supported CBT based digital mental health program (WorkGuru) delivered in the workplace without a discussion group (MSG)

Waiting list (N = 28)

**Characteristics**

**Arm-level characteristics**

| Characteristic | WorkGuru + discussion group (DG) (N = 26) | WorkGuru without a discussion group (MSG) (N = 28) | Waiting list (N = 28) |
|---|---|---|---|
| **Age**<br>Mean (SD) | 40.2 (9.8) | 43.4 (9.9) | 39.2 (10.6) |
| **Female**<br>Sample size | n = 21 ; % = 81 | n = 24 ; % = 86 | n = 25 ; % = 89 |
| **UK**<br>Sample size | n = 23 ; % = 86 | n = 20 ; % = 71 | n = 23 ; % = 82 |
| **Non-UK**<br>Sample size | n = 2 ; % = 8 | n = 8 ; % = 29 | n = 5 ; % = 18 |
| **Masters, Doctorate or equivalent**<br>Sample size | n = 25 ; % = 58 | n = 12 ; % = 43 | n = 5 ; % = 18 |

| Characteristic | WorkGuru + discussion group (DG) (N = 26) | WorkGuru without a discussion group (MSG) (N = 28) | Waiting list (N = 28) |
|---|---|---|---|
| **First degree or equivalent**<br><br>Sample size | n = 8 ; % = 31 | n = 12 ; % = 43 | n = 14 ; % = 50 |
| **A level or equivalent**<br><br>Sample size | n = 2 ; % = 8 | n = 0 ; % = 0 | n = 7 ; % = 25 |
| **GCSE Grade A*–C or equivalent**<br><br>Sample size | n = 1 ; % = 4 | n = 4 ; % = 14 | n = 2 ; % = 7 |

**Outcomes**

**Study timepoints**

Baseline

8 week (8 weeks follow-up (16 weeks after baseline))

Employee outcomes

| Outcome | WorkGuru + discussion group (DG), Baseline, N = 26 | WorkGuru + discussion group (DG), 8 week, N = 26 | WorkGuru without a discussion group (MSG), Baseline, N = 28 | WorkGuru without a discussion group (MSG), 8 week, N = 28 | Waiting list, Baseline, N = 28 | Waiting list, 8 week, N = 28 |
|---|---|---|---|---|---|---|
| **Mental health symptoms**<br>Reported as DASS-21 - Depression | 19.9 (10.2) | 15.5 (8.5) | 20.2 (9.6) | 13.8 (9.5) | 20.5 (9.4) | 16 (9.9) |

| Outcome | WorkGuru + discussion group (DG), Baseline, N = 26 | WorkGuru + discussion group (DG), 8 week, N = 26 | WorkGuru without a discussion group (MSG), Baseline, N = 28 | WorkGuru without a discussion group (MSG), 8 week, N = 28 | Waiting list, Baseline, N = 28 | Waiting list, 8 week, N = 28 |
|---|---|---|---|---|---|---|
| Mean (SD) | | | | | | |
| **Job stress** Reported as DASS-21 stress<br><br>Standardised Mean (SD) | 23.3 (7.7) | 18.1 (7.7) | 24 (9.4) | 15.9 (6.6) | 24.1 (8) | 20.6 (8.7) |
| **Absenteeism** Reported as number absent from work<br><br>No of events | n = 4 ; % = 15.4 | n = 1 ; % = 4.5 | n = 7 ; % = 25 | n = 3 ; % = 13 | n = 8 ; % = 28.6 | n = 6 ; % = 23.1 |
| **Absenteeism** Reported as number absent from work<br><br>Sample size | n = 26 ; % = 100 | n = 22 ; % = 84.6 | n = 28 ; % = 100 | n = 23 ; % = 82.1 | n = 28 ; % = 100 | n = 26 ; % = 92.9 |
| **Mental wellbeing** Reported as IWP - Comfort<br><br>Mean (SD) | 7.4 (2.2) | 9.5 (3.3) | 7.6 (2.7) | 11 (5.1) | 7.2 (2.3) | 9 (3.7) |

| Outcome | WorkGuru + discussion group (DG), Baseline, N = 26 | WorkGuru + discussion group (DG), 8 week, N = 26 | WorkGuru without a discussion group (MSG), Baseline, N = 28 | WorkGuru without a discussion group (MSG), 8 week, N = 28 | Waiting list, Baseline, N = 28 | Waiting list, 8 week, N = 28 |
|---|---|---|---|---|---|---|
| **job satisfaction**<br>Reported as IWP - Enthusiasm<br><br>Mean (SD) | 8.6 (2.8) | 9.3 (3.7) | 8.4 (3.5) | 10 (4) | 7.9 (2.4) | 9.3 (4.3) |

Mental health symptoms - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Mental wellbeing - Polarity - Higher values are better

Job satisfaction - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - WorkGuru without a discussion group vs Waiting list (8 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Absenteeism - WorkGuru without a discussion group vs Waiting list (8 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Job stress - WorkGuru without a discussion group vs Waiting list (8 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Mental wellbeing - WorkGuru without a discussion group vs Waiting list (8 weeks follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Study arms**

WorkGuru + discussion group (DG) (N = 26)

| | |
|---|---|
| **Brief name** | Online CBT with discussion group support. |
| **Rationale/theory/Goal** | This study compares engagement with a minimally guided digital mental health program (WorkGuru) delivered in the workplace with a discussion group (DG) and without a discussion group (MSG), and with a wait list control (WLC); (pilot phase of a definitive trial). |
| **Materials used** | Access to the internet and a tablet or computer |

| | |
|---|---|
| **Procedures used** | Participants allocated to the discussion group were able to access the intervention immediately, but were asked to wait for up to three weeks for the start of the group.<br><br>The programme was based on the psychological principles of CBT, positive psychology, mindfulness and problem solving.<br><br>There were seven core modules (information and exercises on stress, resilience, values, cognitive restructuring, automatic thoughts, unhelpful thinking styles and time management) and three additional modules (mindfulness, problem solving and imagining the future self).<br><br>The modules were a combination of educational reading, audio, brief animations and interactive exercises.<br><br>Participants completed the modules at their own pace. Participants could also complete eight self-monitoring standardised questionnaires and able to opt-in to a weekly motivational email.<br><br>An e-coach contacted participants at first log in and at 2 and 6 weeks, with personalised messages. Participants could contact the coach for advice and expect a response within 24 hours.<br><br>For discussion group participants, there was the additional feature of an eight-week online guided discussion group that was delivered via a bulletin board. Each week the coach introduced a module and encouraged discussion on the topic. Participants could remain anonymous. |

| | |
|---|---|
| **Provider** | University of Sussex and Sussex Partnership NHS Foundation Trust. |
| **Method of delivery** | The programme was presented on a secure platform that participants logged-on to using an email address and a self-generated password. |
| **Setting/location of intervention** | Online. |
| **Intensity/duration of the intervention** | The programme lasted for eight weeks.<br><br>The coach spent over 1 hour each week per group 41.5 min per participant across the eight-weeks.<br><br>Participating organisations were encouraged to allow staff a minimum of an hour a week to complete the modules. |
| **Tailoring/adaptation** | Not reported. |
| **Unforeseen modifications** | Not reported. |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | Not reported |

Engagement with a minimally supported CBT based digital mental health program (WorkGuru) delivered in the workplace with a discussion group (DG)

**WorkGuru without a discussion group (MSG) (N = 28)**

| | |
|---|---|
| **Brief name** | Online CBT without discussion group support. |
| **Rationale/theory/Goal** | This study compares engagement with a minimally guided digital mental health program (WorkGuru) delivered in the workplace with a discussion group (DG) and without a discussion group (MSG), and with a wait list control (WLC); (pilot phase of a definitive trial). |
| **Materials used** | Access to the internet and a tablet or computer |
| **Procedures used** | Participants allocated to the Minimal Support Group (MSG - no discussion group) were able to access the intervention immediately.<br><br>The programme was based on the psychological principles of CBT, positive psychology, mindfulness and problem solving.<br><br>There were seven core modules (information and exercises on stress, resilience, values, cognitive restructuring, automatic thoughts, unhelpful thinking styles and time management) and three additional modules (mindfulness, problem solving and imagining the future self).<br><br>The modules were a combination of educational<br>reading, audio, brief animations and interactive exercises.<br><br>Participants completed the modules at their own pace. Participants could also complete eight self-monitoring standardised questionnaires and able to opt-in to a weekly motivational email.<br><br>An e-coach contacted participants at first log in and at 2 and 6 weeks, with personalised messages. Participants could contact the coach for advice and expect a response within 24 hours. |
| **Provider** | University of Sussex and Sussex Partnership NHS Foundation Trust. |
| **Method of delivery** | The programme was presented on a secure platform that participants logged-on to using an email address and a self-generated password. |
| **Setting/location of intervention** | Online. |

| | |
|---|---|
| **Intensity/duration of the intervention** | The programme lasted for eight weeks.<br><br>The coach spent over 1 hour each week per group 41.5 min per participant across the eight-weeks.<br><br>Participating organisations were encouraged to allow staff a minimum of an hour a week to complete the modules. |
| **Tailoring/adaptation** | Not reported. |
| **Unforeseen modifications** | Not reported. |
| **Planned treatment fidelity** | Pilot RCT-  no reference to sample size estimates or power calculations. |
| **Actual treatment fidelity** | Protocol adherence was achieved by 70% of participants. |
| **Other details** | Not reported. |

Engagement with a minimally supported CBT based digital mental health program (WorkGuru) delivered in the workplace without a discussion group (MSG)

**Waiting list (N = 28)**

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | This study compares engagement with a minimally guided digital mental health program (WorkGuru) delivered in the workplace with a discussion group (DG) and without a discussion group (MSG), and with a wait list control (WLC); (pilot phase of a definitive trial). |
| **Materials used** | None reported |
| **Procedures used** | All participants including those allocated to WLC had unrestricted access to care as usual. |
| **Provider** | Not applicable |

| | |
|---|---|
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Pilot RCT - no reference to sample size estimates or power calculations. |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | Participants allocated to the waiting list were able to access the intervention after 16 weeks. |

## D.6 Carolan, 2018

| | |
|---|---|
| **Bibliographic Reference** | Carolan, Stephany; de Visser, Richard O; Employees' Perspectives on the Facilitators and Barriers to Engaging With Digital Mental Health Interventions in the Workplace: Qualitative Study.; JMIR mental health; 2018; vol. 5 (no. 1); e8 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Statistical method(s) used to analyse the data** | **Qualitative methods**<br><br>All RCT participants were invited to take and those who had not engaged with the intervention were particularly encouraged to do so.<br><br>• 18 semi-structured telephone interviews were conducted by the 1st author<br>• Interview duration 20-50 mins |

| | |
|---|---|
| | • Participants received an information sheet and provided informed consent<br>• Interviews were recorded, transcribed verbatim and anonymised<br>• Thematic analysis was undertaken using Braun and Clarke method<br>• Both authors reviewed and coded a subset of transcripts and resolved any differences through discussion.<br>• The first author then reviewed and code the remaining transcripts and the second author then reviewed these for inconsistencies.<br><br>**Characteristics**<br><br>• All participants were white<br>• The sample was older than that in the RCT (average age 45 versus 41 years)<br>• There were less females than in the RCT (78% versus 85%)<br>• No participants were recruited from the local authorities, but more were recruited from the third sector organisations that in the original RCT<br>• The number of participants who recalled being randomised to the minimal support group was higher and those recalled being randomised to the discussion group lower than in the original RCT<br>• 78% reported being primarily office based with the remainder a mixture of office based and client focused<br>• 39% said they had engaged well with the intervention, 44% not very well and 17% had never logged on to the intervention |
| **Theme - Positive aspects of digital mental health interventions** | **Convenience (time and place)**<br><br>Participants appreciated the fact that they could access the intervention at a time and place convenient for them. *'……I can get help as soon as possible and I can get it anywhere because it's online on the Internet.'* [Sara, 31 years, university one]<br><br>The flexibility of being to access the intervention at their own convenience also allowed participants to work at their own pace. *'It's incredibly accessible both in terms that I could choose when I was engaging with it, and it allowed me therefore to kind of pace myself and reflect on things and then go back to things when I wanted to rather than saying: "Well you've got a session, it's at 2 o'clock on a Friday and that's it, that's your only window". So I think it made it in some senses more live for me rather than an event that you go to'.* [Robert, 46 years, university one] |
| **Theme - Positive aspects of digital** | **Discreteness and anonymity** |

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| **mental health interventions** | Participants reported that the discreteness and anonymity of the intervention helped them to overcome their fear of stigma of revealing mental health issues to their employer or colleagues. "*I think also it's very discreet. If you have to shuffle off and actually see somebody you know face to face, it's a bit more public, people are more likely to know about it.* [Fiona, 62 years, third sector]<br><br>The anonymity of the internet-based intervention helped some participants take the initial step of engaging with it, as they did not have to speak to someone i order to make an appointment. *'Personally it was easier to say, "I'm doing something to help myself," but without actually having to speak to someone. You know it's quite daunting if you've got a worry to actually pick up the phone and speak to someone'.* [Anna, 47 years, third sector] |
| **Theme - Positive aspects of digital mental health interventions** | **Being able to take time out**<br><br>Some participants also reported valuing being able to take time out from a stressful situation in the workplace and to focus on themselves. *'To be able to in a workplace setting after dealing with a particularly stressful case, being able to remove yourself and do something just for you with permission from your employer, was really an empowering tool that they gave us'.* [Jane, 28 years, third sector] |
| **Theme - Negative aspects of digital mental health interventions** | **Need for a dedicated time and private space.**<br><br>Although participants appreciated the flexibility and convenience of being able to access the intervention at any time and from any place, some reported that they felt they needed more self -discipline to stay engaged with the intervention when there was no dedicated appointment time that they needed to adhere to. *'It's good not to have to do things in a certain time but it's also not good because you can often think" Actually I'll do it later," and never get round to it.[...] If it's online it's down to the individual themselves to go and do what they are required to do'.*[Simon, 48 years, university two].<br><br>Others had concerns about privacy, especially if working in an open-plan space. *'And the other problem is sitting in an open plan, hot-desking space. ……So I don't know if there's a sense of feeling that other colleagues can see what you're working on, they can see the screen of your computer'.* [Natalie, 40 years, third sector] |
| **Theme - Negative aspects of digital mental health interventions** | **Being able to separate therapy from work**<br><br>Some participants felt that while being able to access the intervention from their desks may be convenient, they did not benefit from having the spatial distance or temporal space from work that they would with a face- to- face appointment. *'If you go somewhere else to an appointment, I think on the whole you're going to get more out of it than if you're fitting it in* |

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| | *but you're still at your desk and you can see the invoices that need approving and your to-do list'.* [Katy, 63 years, university one]<br><br>*'You're doing something very reflective and personal that might make you feel uncomfortable feelings, and then to go back into work mode immediately. I guess think even if you go to a counselling session you have that physical journey back to work which helps switch modes back and so you've got time to kind of leave those feelings behind'.* [Sue, 43 years, university two] |
| **Theme - Negative aspects of digital mental health interventions** | **Self-image**<br><br>Some participants were conscious that at work they presented themselves as strong and capable to colleagues. Having to reflect on their mental health while in the workplace could make them feel exposed. *.'….it starts you having to think about the other stuff that's affecting you internally but you're managing to put on a pretty OK persona when you're at work so then it just felt like I was having to...I didn't want to expose myself too much I suppose'.* [Anna, 47 years, third sector] |
| **Theme - Negative aspects of digital mental health interventions** | **Lack of human interaction**<br><br>Although some participants liked the fact that with a minimally guided intervention they didn't have to speak to anyone, others felt this allowed them to disengage more easily. *'It does allow you to maybe explore these things without having to open up directly to a person. But then the downside to that is that it also allows you to walk away from it more easily'.* [Tony, 56 years, third sector]<br><br>The lack of one-to-one interaction also meant that some participants felt that they maybe chose to engage with the easier elements rather than the more challenging elements. Some others felt that the lack of human interaction left them feeling isolated and that they hadn't shared their experience or made an emotional connection. *'I guess it's the isolation, with doing everything anonymously and just taking time out on your own to do it there's no real sharing involved in it'* [Jane, 28 years, third sector] |
| **Theme - Facilitators to engagement** | **Programme content and design**<br><br>In addition to convenience, anonymity and flexibility, participants reported that interesting programme content and the interactive design were factors that encouraged them to engage with the intervention. *'It was in nice bite size chunks. It was well presented. It was quite enjoyable. Yeah, it was quite enjoyable to do. It was good taking yourself out of the work situation for a bit, before going back in again. So I mean it was just a very positive experience so I think that just encouraged me to carry on with it.* [Claire, 57 years, university one]. |

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| | Particular features that participants found helpful included: an indication of the time required to complete each module to enable participants to plan when they would complete the module, a progress tracker showing modules completed or to be completed, and reminders to log in. *You can see on screen you've done this and you've done this and you've done this, but you still need to do this. It was almost like playing an online game*. Katy, 63 years, university one] |
| **Theme - Facilitators to engagement** | **Promotion by employers/ managers**<br><br>Participants reported that it was important to feel they had the support and encouragement of the organisation and line managers to use the intervention and that this gave the intervention legitimacy. *I think probably the fact that this was circulated by the university, it probably added a bit of...almost legitimacy about it, I guess. This was something that was supported by the university, which is probably a little bit silly but when you're in a stressed situation it is just the knowledge that yeah well the university said this is an ok thing to do, it's ok for me to take time to be working through this and it's to their benefit because if I'm working more effectively then they benefit as well.* [Claire, 57 years, university one] |
| **Theme - Barriers to engagement** | **Time, capacity and motivation**<br><br>Over half of participants noted that lack of time and their workload were the main reasons why they may not engage with the intervention, even though it may be something they wanted to do. *"Oh god, have I really got time to do this today? Am I going to feel guilty for leaving my colleagues?"* [Jane, 28 years, third sector]<br><br>In addition it was noted that for some people the mental health symptoms they were experiencing may mean they lacked the motivation to engage with the intervention. "*Probably at the time, um I was very low, very depressed. …….. I didn't have any motivation at all.* [Chloe, 44 years, telecommunication] |
| **Theme - Barriers to engagement** | **The e-coach**<br><br>There were mixed experiences, expectations of and views on the usefulness of the e- coach. some did not engage with the coach, others were unclear what their role was. Where participants had engaged with the e-coach some found it helpful while others found it less so, "*I actually found the initial contact, really really, almost like validating. I was an individual I wasn't just a number, which I kind of really, really...really impressed me.* [Robert, 46 years, university one]<br><br>*Yeah it just, it seemed like an automated thing. I didn't really, I mean obviously I thought if you sent them an email it would get through to someone but um it just didn't feel very personal I guess.* [Rose, 38 years, university one] |
| **Theme - Perfect digital intervention** | **Format, design and content** |

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| | When asked what a perfect digital mental health intervention would like, participants were almost evenly divided between wanting to access it on a computer only, or via a computer and smartphone, with just two wanting it to be accessible only via a smart phone.<br><br>Participants reported wanting the intervention to be anonymous, confidential and capable of being adapted or tailored to the needs of different people. "*It's just remembering that everyone is different and everyone's moods has ups and downs, and depressions and joys are addressed in different ways and I guess a single program that takes everyone through a singular route probably doesn't hit the nail on the head.* [Tony, 56 years, third sector)<br><br>Almost all participants described their perfect intervention as short course that they could work through independently and indefinite access to a regularly updated website that would provide information and personalised advice. *'….a short, fairly intensive course that you were checked up on whether you'd done it or not which would really help followed by the availability continuously after that, um, just for dipping into or for necessarily contacting somebody in person if possible'.* [Rachel, 55 years, university one]<br><br>A simple structure and layout would be helpful, particularly for those not confident with technology *'…….I am a bit of a, yeah a technology dinosaur to be honest so it would have to be very simple and accessible'.* [Natalie, 40 years, third sector]<br><br>And the content would be interactive. *It's got to be something like this [WorkGuru] ...for me anyway, something that is interactive...because that's how I engage with stuff, it can't be just reading .I like that this was a mixture of reading, listening and actually doing stuff because I think it would be very easy not to take it in if it was just reading from a screen'.* [Claire, 57 years, university one] |
| **Theme - Perfect digital intervention** | **Peer support**<br><br>Participants were split over whether they wanted peer support as part of an ongoing provision. One suggested that peer support should be provided in small groups, whereas others would prefer not to engage with a support group. *'…….I would probably want a smaller peer group, as in the sort of size that was in the discussion group that was active with WorkGuru rather than it being a kind of Facebook type thing where anybody can get involved because I think that floods it, and it becomes too much to actually digest and get involved with'.* [Jill, 31 years, third sector] |

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| | *'I'm not good with groups of people really so that's not something I'd make much use of myself.* [Rose, 38 years, university one]<br><br>Some participants suggested it would be useful to have monitoring such as self- tracking of stress symptoms but would not want this information shared with their employer. The majority of participants wanted to be able to contact a coach of they needed to |

**Critical appraisal - CASP qualitative checklist**

| Section | Question | Answer |
|---|---|---|
| Overall risk of bias and relevance | Overall risk of bias | Low |
| Overall risk of bias and relevance | Relevance | Highly relevant |

## D.7 Clemow, 2018

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|---|---|
| **Bibliographic Reference** | Clemow, LP; Pickering, TG; Davidson, KW; Schwartz, JE; Williams, VP; Shaffer, JA; Williams, RB; Gerin, W; Stress management in the workplace for employees with hypertension: a randomized controlled trial.; Translational behavioral medicine; vol. 8 (no. 5); 761-770 |

### Study details

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT01262066 |
| **Aim** | To evaluate the effectiveness of a standardised stress management program delivered in groups at the workplace for reducing BP compared with enhanced usual care. |
| **Country/geographical location** | US |

| | |
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| **Setting** | Workplace:<br>• Sector: not reported<br>• Industry: healthcare<br>• Organisation size: large<br>• Contract type: not reported<br>• Seniority: not reported<br>• Income: mixed (above and below $50,000) |
| **Inclusion criteria** | Employees whose screening BP (average of three measurements) was greater than or equal to140 mm Hg SBP or 90 mm Hg diastolic BP (DBP) and whose average readings did not exceed 180/110 mm Hg at both this screening and the subsequent baseline evaluation were eligible and invited to participate in the RCT. |
| **Exclusion criteria** | Pregnancy and end-stage renal disease |
| **Method of randomisation** | Randomisation performed using random-sized randomisation blocks provided by the study statistician, in accordance with CONSORT (Consolidated Standards of Reporting Trials) guidelines. To ensure that any observed treatment benefits were not occurring only in patients with high hostility levels, the randomisation was stratified for baseline hostility (two categories based on Barefoot's criterion of a score =13 on the Cook-Medley Hostility Scale. |
| **Method of allocation concealment** | Randomization was done by calling an off-site person holding the randomisation envelopes. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • An intent-to-treat analysis was performed on all randomised participants. A multilevel, repeated-measures regression analysis was performed to generate full information maximum likelihood estimates of the group-specific average change in SBP and DBP between baseline and the 2-month posttreatment assessments and to estimate and test the differential change between the intervention and usual care groups. Consistent with intent-to-treat principles, all participants who were randomised, including two participants who were subsequently deemed ineligible, were included in the analysis. In the multilevel model, treatment group, time (baseline vs. 2-month follow-up), and the interaction of treatment group and time were entered as fixed effects predicting the |

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|---|---|
| | primary outcomes, SBP, and DBP. Because the randomization was stratified by hostility group, hostility group and the interaction of hostility group and time were included as covariates.<br>• In secondary analyses, analysis was repeated excluding those who did not complete the study and repeated the intent-to-treat analysis controlling for the use of hypertension medications at baseline and changes in medication use.<br>• Psychosocial variables were tested for baseline group differences, and change scores from baseline to 2-month follow-up were tested using t-tests for group differences.<br>• Correlational analyses were conducted to explore relationships between change scores for BP and psychosocial variables.<br>• Exploratory analyses were performed to test whether psychosocial variables that changed significantly mediated the differential decline in BP associated with the intervention. |
| **Attrition** | Of the 392 eligible employees, 211 declined to participate in this study or could not be contacted after three telephone messages. The remaining 181 employees agreed to participate, but 88 of these individuals were ineligible because the average of their second set of baseline BP readings was below 140/90 mm Hg. One additional person was eligible but declined to participate prior to randomisation. Of the 92 who were randomized, 46 were assigned to the intervention group, and 46 were assigned to the usual care control group. Eleven participants dropped out after randomisation (six in the intervention group and five in the usual care control group). Two participants, both in the intervention group, were later found to have been ineligible because their average BP measurements were computed in error and were actually<br><br>below the cut-off. |
| **Assessments and timepoints** | The following outcomes were measured:<br><br>• Blood pressure measurements<br>• Psychosocial measures including the 27-item Barefoot version of the Cook-Medley Hostility Scale, Centers for Epidemiological Studies–Depression Scale (CESD), the 10-item Perceived Stress Scale, the Maslach Burnout Scale, the Karasek Job Content Questionnaire, the Personal Assertion Analysis (PAA), the Interpersonal Support Evaluation List, and the Ruminative Response Scale.<br><br>At the following timepoints:<br><br>• baseline |

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| | • 2 months post-intervention |
| **Study limitations (author)** | • Research staff were not blinded to participant group assignment.<br>• In the absence of an attention-control group, it is not possible to be sure how much of the positive BP change was due to the intervention content itself or the psychologist-led meetings with employees in a group setting.<br>• Specific cost data were not collected, so cost-effectiveness analyses could not be performed. |
| **Study limitations (reviewer)** | • Results from perceived stress scale measures were not reported<br>• Self-reported outcomes<br>• Long-term outcomes were not measured |
| **Source of funding** | NIH grant from the National Heart, Lung, and Blood Institute |

**Study arms**

Stress management (N = 46)

46 participants were randomised to receive stress management.

Minimally-enhanced usual care (N = 46)

46 participants were randomised to receive minimally-enhanced usual care.

**Characteristics**

**Arm-level characteristics**

| Characteristic | Stress management (N = 46) | Minimally-enhanced usual care (N = 46) |
|---|---|---|
| **Age**<br><br>Mean (SD) | 48.4 (8.4) | 48.7 (9) |
| **Women** | n = 38 ; % = 83 | n = 33 ; % = 72 |

| Characteristic | Stress management (N = 46) | Minimally-enhanced usual care (N = 46) |
|---|---|---|
| No of events | | |
| **Men**<br>No of events | n = 8 ; % = 17 | n = 13 ; % = 28 |
| **White, Non-Hispanic**<br>No of events | n = 8 ; % = 17 | n = 6 ; % = 13 |
| **White Hispanic**<br>No of events | n = 8 ; % = 17 | n = 6 ; % = 13 |
| **Black non-Hispanic**<br>No of events | n = 22 ; % = 48 | n = 20 ; % = 43 |
| **Black (Hispanic)**<br>No of events | n = 3 ; % = 7 | n = 5 |
| **Asian/Indian**<br>No of events | n = 2 ; % = 4 | n = 2 ; % = 4 |
| **Asian/Pacific islander**<br>No of events | n = 1 ; % = 2 | n = 3 ; % = 7 |
| **Other**<br>No of events | n = 2 ; % = 4 | n = 4 ; % = 9 |
| **$50,000 or less**<br>No of events | n = 25 ; % = 58 | n = 23 ; % = 54 |

| Characteristic | Stress management (N = 46) | Minimally-enhanced usual care (N = 46) |
|---|---|---|
| **More than $50,000**<br><br>No of events | n = 18 ; % = 42 | n = 20 ; % = 47 |

**Outcomes**

**Study timepoints**

Baseline

2 month (Outcomes were measured at 2-months post-intervention.)

**Employee outcomes**

| Outcome | Stress management, Baseline vs 2 month, N = 46 | Minimally-enhanced usual care, Baseline vs 2 month, N = 46 |
|---|---|---|
| **Job stress**<br>Self-reported - emotional exhaustion subscale of Maslach Burnout Inventory<br><br>Mean (SD) | -2.5 (9.6) | 3.12 (9.7) |
| **Mental health symptoms**<br>Self-reported - Centers for Epidemiological Studies–Depression Scale (CESD)<br><br>Mean (SD) | 0.1 (8.9) | 1 (5.9) |

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Job stress - Stress management - Minimally-enhanced usual care**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Self-reported outcomes)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns<br>*(Not all outcomes reported)* |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and lack of reporting for all outcomes)* |

**Employee outcomes - Mental health symptoms - Stress management - Minimally-enhanced usual care**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Self-reported outcomes)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns<br>*(Not all outcomes reported)* |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and lack of reporting for all outcomes)* |

**Study arms**

Stress management (N = 46)

| | |
|---|---|
| **Brief name** | Stress management programme [page 761 - abstract] |
| **Rationale/theory/Goal** | The LifeSkills Workshop is a structured cognitive-behavioural group intervention that draws on cognitive-behavioural techniques and stress reduction approaches. It is framed as training to increase a person's resiliency for coping with stressful situations, rather than as treatment for a mental disorder. [page 746] |
| **Materials used** | Videos that were integrated into sessions [page 764] |

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| **Procedures used** | • Participants attended 10 weekly 1-hr sessions in groups of 8–10 participants.<br>• The facilitator lead participants through each of several behavioural skills, modelling them as necessary.<br>• Skills included self-monitoring, such as identification and evaluation of thoughts, feelings, and behaviours in response to stressful situations; problem solving; assertiveness in dealing with anger- and stress-inducing events and/or demands; deflection skills to reduce distress in stressful situations, such as breathing and muscle relaxation, distraction, and increasing distress tolerance; communication skills; and increasing empathy and building positive relationships.<br>• The same facilitator worked with the same group of participants throughout the course of the intervention.<br>• Facilitators offered individual consultation to participants who missed a session.<br><br>[page 764] |
| **Provider** | Three doctoral-level clinical or counselling psychologists who were trained according to the guidelines used by Williams LifeSkills, Inc., to serve as group facilitators; they received ongoing supervision from the senior study clinician (L.P.C.) to ensure fidelity to<br><br>the material. [page 764] |
| **Method of delivery** | Group sessions [page 764] |
| **Setting/location of intervention** | Group sessions were conducted at midday lunch breaks, during the workday, between 12 noon and 2:00 pm. [page 764] |
| **Intensity/duration of the intervention** | 10 weekly 1-hr sessions [page 764] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Sessions followed the Williams LifeSkills Workshop manual and video. The weekly sessions were audio recorded to monitor treatment fidelity and to allow for supervision of the facilitators. [page 764] |

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| **Actual treatment fidelity** | Not reported |
| **Other details** | Participants were paid $125 for completing the trial. [page 762] |

**Minimally-enhanced usual care (N = 46)**

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|---|---|
| **Brief name** | Minimally-enhanced usual care [page 764] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Brochure on BP control developed by the National Heart, Lung, and Blood Institute [58], containing information about hypertension and suggestions for making lifestyle changes to reduce BP. [page 764] |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |

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| **Actual treatment fidelity** | Not applicable |
| **Other details** | Participants were paid $125 for completing the trial. [page 762] |

## D.8 de Zeeuw, 2010

**Bibliographic Reference** de Zeeuw, Eveline LEJ; Tak, Erwin CPM; Dusseldorp, Elise; Hendriksen, Ingrid JM; Workplace exercise intervention to prevent depression: a pilot randomized controlled trial; Mental Health and Physical Activity; 2010; vol. 3 (no. 2); 72-77

**Study details**

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|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Study start date** | 2008 |
| **Aim** | To determine whether it is feasible to deliver an exercise program to inactive employees with minimal symptoms of depression, and the size of effects on the mental and physical health of employees. |
| **Country/geographical location** | The Netherlands |
| **Setting** | Workplace:<br>• Sector: private<br>• Industry: insurance<br>• Organisation size: large<br>• Contract type: not reported<br>• Seniority: not reported<br>• Income: white collar-workers |

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| **Inclusion criteria** | • Willingness to participate in the exercise program<br>• Having minimal symptoms of depression (sub-threshold depression) based on a score of minimally 5 and maximally 9 on the Patient Health Questionnaire (PHQ- 9)<br>• No history of psychological treatment, not being physically active according to current physical activity guidelines<br>• No intention to start with exercise during the study period<br>• No medical contraindications to exercise according to the Physical Activity Readiness Questionnaire (PARQ) |
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | By drawing sealed envelopes |
| **Method of allocation concealment** | Sealed envelopes |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Descriptive data were determined for the baseline characteristics, and differences between the control and the exercise groups were tested using a t-test for the continuous variables and a chi-squared test for the categorical variables.<br>• Variables with significant differences between the exercise group and the control group were treated as covariates in all further ANCOVAs.<br>• Change scores were computed for all outcome variables by subtracting the baseline score from the post-test score. For the primary outcome variable (depression), also an imputed change score was computed using baseline value carried forward to follow-up.<br>• Differences between the groups in average change score were tested using ANCOVAs, with the change score as dependent variable, the group-variable as independent, and variables showing significant baseline differences as covariates.<br>• Effect sizes were calculated by taking the square root of the division of the difference between the mean change score between the exercise group and the control group by the pooled standard deviation of the change scores. |

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| | Standard errors of the effect sizes were calculated using the effect size and the number of participants in both the control and the exercise group.<br>• For all analyses, two-tailed p-values of <0.05 indicated statistical significance.<br>• An intention-to-treat analysis was performed for the primary outcome variable.<br>• No sample sizes were reported |
| **Attrition** | • Intervention: 14 participants completed out of 15 randomised<br>• Control: 13 participants completed out of 15 randomised |
| **Assessments and timepoints** | The following outcomes were measured:<br>• Depression<br>• Physical measures and exercise behaviour<br>• Sick leave<br>At the following timepoints:<br>• Baseline<br>• After the intervention (10 weeks) |
| **Study limitations (author)** | • More than half of the contacted employees (56%) did not respond to our screening questionnaire.<br>• There was a lack of a long-term follow up.<br>• Although all participants were given an individual lifestyle advice at the end of the study, the effect of this advice on their physical activity in the long term has not been measured. |

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| **Study limitations (reviewer)** | Outcome measure of depression was self-reported |
| **Source of funding** | Dutch Ministry of Health, Welfare and Sport |

**Study arms**

Exercise (N = 15)

15 participants were randomised to the intervention group.

Control (N = 15)

15 participants were randomised to the control group.

**Characteristics**

**Arm-level characteristics**

| **Characteristic** | **Exercise (N = 15)** | **Control (N = 15)** |
|---|---|---|
| **Age**<br><br>Mean (SD) | 41.3 (6.5) | 41 (8.3) |
| **Gender**<br>Men<br><br>No of events | n = 9 ; % = 60 | n = 7 ; % = 47 |

**Outcomes**

**Study timepoints**

Baseline

10 week (Outcomes were measured post-intervention)

**Employee outcomes**

| Outcome | Exercise, Baseline, N = 15 | Exercise, 10 week, N = 15 | Control, Baseline, N = 15 | Control, 10 week, N = 15 |
|---|---|---|---|---|
| **Mental health symptoms** (0 to 27)<br>Self-reported - depression subscale of PHQ-9 - no depression (0 to 4), minimal symptoms of depression (5 to 9), mild depression (10 to 14), moderately severe depression (15 to 19), and severe depression (20 to 27)<br><br>Sample size | n = 15 ; % = 100 | n = 14 ; % = 93.3 | n = 15 ; % = 100 | n = 13 ; % = 86.7 |
| **Mental health symptoms** (0 to 27)<br>Self-reported - depression subscale of PHQ-9 - no depression (0 to 4), minimal symptoms of depression (5 to 9), mild depression (10 to 14), moderately severe depression (15 to 19), and severe depression (20 to 27)<br><br>Mean (SD) | 6.2 (1.5) | 3.1 (1.9) | 6.8 (1.5) | 5.8 (2.2) |

Mental health symptoms - Polarity - Lower values are better

**Employer outcomes**

| Outcome | Exercise, Baseline, N = 15 | Exercise, 10 week, N = 15 | Control, Baseline, N = 15 | Control, 10 week, N = 15 |
|---|---|---|---|---|
| **absenteeism**<br>Company records - number of days a participant was absent from work during the study period and during the same period the previous year<br><br>Sample size | n = 12 ; % = 80 | n = 12 ; % = 80 | n = 10 ; % = 66.7 | n = 10 ; % = 66.7 |
| **absenteeism**<br>Company records - number of days a participant was absent from work during the study period and during the same period the previous year | 1.8 (3.6) | 0.8 (1.1) | 2 (2.7) | 1.9 (2.2) |

| Outcome | Exercise, Baseline, N = 15 | Exercise, 10 week, N = 15 | Control, Baseline, N = 15 | Control, 10 week, N = 15 |
|---|---|---|---|---|
| Mean (SD) | | | | |

absenteeism - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Mental health symptoms - Exercise - Control**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Employer outcomes - absenteeism - Exercise - Control**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study details**

| | |
|---|---|
| **Brief name** | |

**Study arms**

Exercise (N = 15)

| | |
|---|---|
| **Brief name** | Exercise programme [page 73] |
| **Rationale/theory/Goal** | Studies have shown that exercise reduces depressive symptoms, at least in clinical populations. An additional benefit of exercise is that it can improve fitness and work-related outcomes such as work attendance and job stress. [pages 78 and 79] |
| **Materials used** | Heart rate monitor [page 73] |

| | |
|---|---|
| **Procedures used** | • Participants in the exercise group attended two supervised exercise sessions per week for 10 consecutive weeks.<br>• An individual training program was designed for each participant based on the results of the baseline physical fitness test.<br>• For each participant, a training session began with a 10-min warming-up, followed by 10 min of power training. Subsequently, the training included 10 to 20 minutes of cycling on a bicycle ergometer, jogging on a treadmill, walking on a cross-trainer, or climbing stairs on a pedal stepper. The exercise program ended with 10 min cooling down.<br>• Heart rate was continuously monitored during the exercise program using a heart rate monitor (Polar, Electro Oy, Finland)<br>• To encourage lifestyle daily physical activity, the instructor talked about the beneficial aspects of having a physically active lifestyle outside the exercise sessions, without giving direct advice on types and frequency of activities.<br>• Afterwards, participants received exercise and life-style advice.<br><br>[pages 73 and 74] |
| **Provider** | Professional instructor [page 74] |
| **Method of delivery** | Groups of approximately eight people [page 74] |
| **Setting/location of intervention** | During working hours in the company's fitness centre [page 73] |
| **Intensity/duration of the intervention** | Two sessions per week for 10 weeks [page 73] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |

| | |
|---|---|
| **Planned treatment fidelity** | Compliance was recorded and participants were contacted by phone or e-mail if they missed a session to prevent drop-out from the intervention. [page 73] |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

Control (N = 15)

| | |
|---|---|
| **Brief name** | Control [page 73] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants in the were asked not to change their exercise behavior and lifestyle during the study period. After the intervention period, participants received exercise and life style advice, and participants were offered the opportunity to participate in the fitness program. [page 73] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |

| | |
|---|---|
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.9 Diaz-Silveira, 2020

| | |
|---|---|
| **Bibliographic Reference** | Diaz-Silveira, Cintia; Alcover, Carlos-Maria; Burgos, Francisco; Marcos, Alberto; Santed, Miguel A; Mindfulness versus Physical Exercise: Effects of Two Recovery Strategies on Mental Health, Stress and Immunoglobulin A during Lunch Breaks. A Randomized Controlled Trial.; International journal of environmental research and public health; 2020; vol. 17 (no. 8) |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT03728062 |
| **Aim** | To determine the effects of mindfulness meditation (MM) and physical exercise (PE), practised as daily recovery activities during lunch breaks, on perceived stress, general mental health, and immunoglobin A (IgA). |
| **Country/geographical location** | Spain |
| **Setting** | Workplace:<br>• Sector: private<br>• Industry: telecommunications |

| | |
|---|---|
| | • Organisation size: large<br>• Contract type: permanent<br>• Seniority: team leaders<br>• Income: mostly university educated |
| **Inclusion criteria** | Mid-level professionals of the same organization, in this case team leaders, with medium levels of perceived stress at 0.35 (SD = 0.14) according to the Perceived Stress Questionnaire. |
| **Exclusion criteria** | Workers who already practiced mindfulness meditation or physical exercise more than once a week or who suffered some type of mental illness or physical illness. |
| **Method of randomisation** | Details not reported |
| **Method of allocation concealment** | Participants were given participant number upon enrolment by an independent research assistant who had no access to the randomisation form. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Data were explored to verify normal distribution.<br>• A descriptive analysis of the sample was conducted comparing, in addition, the experimental groups in the sociodemographic and dependent variables on the baseline, running the Chi-square test (qualitative variables), together with a univariate ANOVA for the analysis of quantitative variables.<br>• The analysis of the effects of the interventions is carried out through an intention-to-treat analysis by adjusting a mixed linear model (MLM) using the maximum restricted likelihood method for the group, time and interaction factors (group x time).<br>• The analysis of the required sample size required 111 people, taking as reference the interaction factor with a power of 0.80, an alpha value of 0.05, and correcting the criterion of non-sphericity to 0.75 in order to reach a size of the effect between moderate and high (f = 0.39). |
| **Attrition** | • Mindfulness intervention: out of 30 participants randomised to the arm, 9 missed follow-up measurements.<br>• Physical exercise intervention: out of 30 participants randomised to the arm, 14 missed follow-up measurements. |

| | |
|---|---|
| | • Control: out of 34 participants randomised, 14 missed follow-up measurements. |
| **Assessments and timepoints** | The following outcomes were assessed:<br><br>• Perceived stress questionnaire (PSQ)<br>• General health questionnaire (GHQ-12)<br>• Salivary Immunoglobulin A (sIgA)<br><br>At the following timepoints:<br><br>• Baseline<br>• 1-month follow-up<br>• 6-month follow-up |
| **Study limitations (author)** | • The sample cannot be considered representative of the population as a whole, since it consists of university-educated Caucasian workers employed in a very specific sector.<br>• Some of the study's data were obtained from self-reported measures, subject to social desirability bias. |
| **Study limitations (reviewer)** | None |
| **Source of funding** | No external funding |

**Study arms**

MBSR (N = 30)

Physical exercise (N = 30)

Wait-list (N = 34)

**Characteristics**

**Arm-level characteristics**

| Characteristic | MBSR (N = 30) | Physical exercise (N = 30) | Wait-list (N = 34) |
|---|---|---|---|
| **Age**<br>Mean (SD) | 47.4 (3.84) | 47.77 (5.16) | 45.44 (8.66) |
| **Women**<br>No of events | n = 23 ; % = 76.7 | n = 18 ; % = 60 | n = 22 ; % = 64.7 |
| **Men**<br>No of events | n = 7 ; % = 23.3 | n = 12 ; % = 40 | n = 12 ; % = 35.5 |
| **Secondary education**<br>No of events | n = 1 ; % = 3.3 | n = 2 ; % = 6.7 | n = 2 ; % = 5.3 |
| **Bachelor's degree**<br>No of events | n = 19 ; % = 63.3 | n = 12 ; % = 4 | n = 13 ; % = 38.2 |
| **Master's degree**<br>No of events | n = 10 ; % = 33.3 | n = 53.3 ; % = 17 | n = 18 ; % = 52.9 |
| **Doctoral degree**<br>No of events | n = 0 ; % = 0 | n = 0 ; % = 0 | n = 1 ; % = 2.9 |

**Outcomes**

**Study timepoints**

6 month (After the intervention)

**Employee outcomes**

| Outcome | MBSR, 6 month, N = 30 | Physical exercise, 6 month, N = 30 | Wait-list, 6 month, N = 34 |
|---|---|---|---|
| **Job stress**<br>Using Perceived Stress Questionnaire (PSQ)<br><br>Mean (SD) | 0.52 (0.17) | 0.49 (0.14) | 0.55 (0.17) |
| **Mental health symptoms**<br>Using General Health Questionnaire (GHQ-12)<br><br>Mean (SD) | 12.89 (6.66) | 13.61 (6.52) | 12.89 (4.86) |

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - MBSR vs Physical exercise vs Wait-list (6 months follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Self-report outcomes)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-report outcomes)* |

**Mental health symptoms - MBSR vs Physical exercise vs Wait-list (6 month follow-up**)

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Self-report outcomes)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-report outcomes)* |

**Study arms**

MBSR (N = 30)

| | |
|---|---|
| **Brief name** | Mindfulness meditation [page 1 - abstract] |
| **Rationale/theory/Goal** | Mindfulness meditation (MM) is a practice based on Buddhist traditions, which develops full attention and awareness through sitting meditation. It has rapidly gained popularity in the Western world due to its accessibility and easy practice. [page 3] |
| **Materials used** | Participants were given instructions in writing and in audio format (mp3), so that they could practice meditation as a group [page 6] |
| **Procedures used** | • Participants attended a four-hour information session<br>• The group met with its certified MBSR instructor on Mondays, who explained the week's meditation, based on Jon Kabat-Zinn's MBSR Programme<br>• The intervention followed a specific protocol: week 1, 15-min meditation based on breathing; week 2, 20-min meditation based on breathing and body awareness; week 3, 25-min meditation based on breathing, body awareness and hearing sensations; weeks 4 and 5, 30-min meditation based on breathing, body awareness and awareness of thoughts and emotions.<br><br>[pages 5 and 6] |
| **Provider** | Certified MBSR instructor [page 6] |
| **Method of delivery** | Group [page 5] |
| **Setting/location of intervention** | Lunch break in a room set up by the company for this purpose—or individually in the place of their choice [pages 5 and 6] |
| **Intensity/duration of the intervention** | During the 5 working days of 5 consecutive weeks (15 minutes in week 1, 20 minutes in week 2, 25 minutes in week 3, 30 minutes in weeks 4 and 5) [page 5] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | All participants kept a daily record of their practice in order to control that their adherence to the practice was at least 70%. [page 5] |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

Physical exercise (N = 30)

| | |
|---|---|
| **Brief name** | Physical exercise [page 1 -abstract] |
| **Rationale/theory/Goal** | Physical exercise (PE) has been recognised for decades to maintain health, prevent illness and promote rehabilitation. Its effectiveness in reducing stress and other related symptoms has been convincingly proven, and it is known to improve the state of mind and mitigate<br><br>depression and anxiety, whether as part of a supervised or unsupervised programme. [page 3] |
| **Materials used** | None reported |
| **Procedures used** | • Participants attended a four-hour information session<br>• The group practiced aerobic exercise, which mainly consisted of running, training on an elliptical machine, rowing or cycling, outdoors or in the gym.<br>• Participants could choose the type of exercise they wanted to do and where to do it. However, the records show that most of them used the company's gym. Participants started their exercise routine with a 5 to 7 min workout. They also had to maintain between 120 and 140 heartbeats per minute during their practice.<br>• Each group had a weekly meeting with its instructor who would introduce the weekly practice and clarify doubts.<br><br>[pages 5 and 6] |
| **Provider** | The intervention was supervised by a certified instructor—bachelor's degree in physical activity and sports sciences—and experienced physical activity trainer. [page 6] |
| **Method of delivery** | Not reported |
| **Setting/location of intervention** | The intervention took place during lunchtime, and participants could choose where they wanted to do exercise, which included the company gym or outdoors. [pages 5 and 6] |

| | |
|---|---|
| **Intensity/duration of the intervention** | During the 5 working days of 5 consecutive weeks (15 minutes in week 1, 20 minutes in week 2, 25 minutes in week 3, 30 minutes in weeks 4 and 5) [page 5] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | All participants kept a daily record of their practice in order to control that their adherence to the practice was at least 70%. [page 5] |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**Wait list (N = 34)**

| | |
|---|---|
| **Brief name** | Wait list [page 5] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants attended a four-hour information session [page 5] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |

| | |
|---|---|
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.10 Duijts, 2008

**Bibliographic Reference** Duijts, Saskia F A; Kant, Ijmert; van den Brandt, Piet A; Swaen, Gerard M H; Effectiveness of a preventive coaching intervention for employees at risk for sickness absence due to psychosocial health complaints: results of a randomized controlled trial.; Journal of occupational and environmental medicine; 2008; vol. 50 (no. 7); 765-76

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To compare the effects of a preventative coaching intervention with usual care n employees 'at risk', of sickness absence due to psychosocial health complaints. |
| **Country/geographical location** | The Netherlands |
| **Setting** | Workplace<br>• Sector - Not specified<br>• Mix of healthcare and educational |

| | |
|---|---|
| | • Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • Employees identified as being 'at risk' of sickness absence for psychosocial health reasons according to the cut-off point of a specifically designed screening instrument.<br>• Those 'at risk' who gave informed consent and then completed a more extensive baseline questionnaire and gave a second informed consent . |
| **Exclusion criteria** | • Employees on full or partial sick leave when the screening instrument was completed<br>• Employees self-reporting chronic psychological conditions at baseline<br>• Employees on more than one work contract<br>• Employees who were pregnant or on maternity leave when the baseline questionnaires were sent out. |
| **Method of randomisation** | Computerised block allocation (size of four), carried out by the principal investigator |
| **Method of allocation concealment** | Researchers and coaches were not blind to the group allocation. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation was used in order to detect a clinically significant difference of 15% between the intervention and control group on self-reported sickness absence, at a two-sided significance level of 5% and a power of 90%; (75 employees<br>per group were needed)<br>• The data were analysed according to the intention to-treat principle, and a per protocol analysis was also carried out excluding all those who did not commit to the whole intervention.<br>• Differences in baseline characteristics were identified with t tests for continuous variables and x squared tests for dichotomous variables. |

| | |
|---|---|
| | • Linear regression (for continuous variables) and logistic regression (for secondary outcomes) were used to estimate the effectiveness of the intervention. |
| **Attrition** | Intervention<br><br>• 25 of the 76 employees randomised to the intervention (32.9%) refused to participate<br>• Of the remaining 51 employees allocated 37 (49% ) completed the coaching intervention<br>• 60 were followed up at 6 months (78.9%)<br>• 57 were followed up at 12 months (75%)<br><br>Control<br><br>• 75 employees were allocated to the control group<br>• 67 were followed up at 6 months (89.3%)<br>• 61 were followed up at 12 months (81.3%)<br><br>Percentages calculated by reviewer |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Follow-up (12 months after baseline)<br><br>Primary outcome<br><br>• sickness absence due to psychosocial health complaints<br><br>Secondary outcomes<br><br>• Short Form Health Survey<br>• General Health Questionnaire. (GHQ-12)<br>• Utrecht Coping List.<br>• job Content Questionnaire<br>• Dutch Questionnaire on the Perception and Judgment of Work. |

| | |
|---|---|
| | • Checklist Individual Strength.<br>• Maslach Burnout Inventory— |
| **Study limitations (author)** | • Employees did not mention psychosocial health complaints (the primary outcome) as the reasons for their sickness absence. Authors suggest this may be due to bias in self reporting diagnoses.<br>• The effect of preventative coaching on the primary outcome could not therefore be confirmed. Authors suggest that a larger difference between groups may have been found if employees had been selected on the basis of being at greater risk of overall sickness absence<br>• Loss to follow up could have affected the results of the study<br>• Participants could not be blinded<br>• Researchers were not blinded and this may have resulted in some bias<br>• The study took place in 3 large companies in 2 sectors. Generalisability needs to be considered especially in relation to the time and expense involved in mailing and processing large numbers of screening instruments<br>• The study took place in a year with low rates of sickness absence so there was a more limited scope to improve rates than usual<br>• Authors note that within the follow up period, there may not have been sufficient time for the employees to develop conditions that would mean they were unable to work (given they were apparently healthy at the outset) or to have gone onto long- term sick leave<br>• Costs of the intervention, in particular those associated with coaching and screening. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | • Health Research and Development Council (Zorg Onderzoek Nederland),<br>• The Netherlands (grant no. 2200.0105), and<br>• SoFoKLeS (Social Fonds voor de Kennis Sector). |

**Study arms**

Preventive coaching (N = 76)

Usual care (N = 75)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Preventive coaching (N = 76) | Usual care (N = 75) |
|---|---|---|
| **Age**<br>Mean (SD) | 43 (9.8) | 42.6 (9.7) |
| **Male**<br>Sample size | n = 15 ; % = 20 | n = 12 ; % = 16 |
| **Female**<br>Sample size | n = 61 ; % = 80 | n = 63 ; % = 84 |

**Outcomes**

**Study timepoints**

**Baseline**

12 month (T2)

**Employee outcomes**

| Outcome | Preventive coaching vs Usual care, 12 month vs Baseline, N1 = 76, N2 = 75 |
|---|---|
| **Mental wellbeing**<br>Reported using GHQ-12<br><br>Mean (95% CI) | -2.24 (-4.9 to 0.42) |
| **Job stress**<br>Reported using MBI-Exhaustion<br><br>Mean (95% CI) | -0.51 (-0.83 to -0.18) |

| Outcome | Preventive coaching vs Usual care, 12 month vs Baseline, N1 = 76, N2 = 75 |
|---|---|
| **Mental health symptoms**<br>Reported as UCL Depressive reaction<br><br>Mean (95% CI) | -1.43 (-2.47 to -0.4) |
| **Quality of life**<br>Reported using SF-36 -self-rated health<br><br>Mean (95% CI) | -0.39 (-0.66 to -0.11) |

Mental wellbeing - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Quality of life - Polarity - Lower values are better

**Employee outcomes**

| Outcome | Preventive coaching, Baseline, N = 76 | Preventive coaching, 12 month, N = 76 | Usual care, Baseline, N = 75 | Usual care, 12 month, N = 75 |
|---|---|---|---|---|
| **absenteeism**<br>Reported as number of people who had recorded sickness absence<br><br>No of events | n = NR ; % = NR | n = 55 ; % = 74.4 | n = NR ; % = NR | n = 50 ; % = 74.6 |

| Outcome | Preventive coaching, Baseline, N = 76 | Preventive coaching, 12 month, N = 76 | Usual care, Baseline, N = 75 | Usual care, 12 month, N = 75 |
|---|---|---|---|---|
| **absenteeism**<br>Reported as number of people who had recorded sickness absence<br><br>Sample size | n = NR ; % = NR | n = 72 ; % = 94.7 | n = NR ; % = NR | n = 67 ; % = 89.3 |
| **job satisfaction**<br>Reported as number satisfied with life<br><br>No of events | n = 43 ; % = 75.4 | n = 40 ; % = 57.1 | n = 47 ; % = 74.6 | n = 41 ; % = 61.2 |
| **job satisfaction**<br>Reported as number satisfied with life<br><br>Sample size | n = 57 ; % = 75 | n = 70 ; % = 92.1 | n = 63 ; % = 84 | n = 67 ; % = 89.3 |

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing - Preventative coaching vs Usual care (changes to 12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Job stress - Preventative coaching vs Usual care (changes to 12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental health symptoms - Preventative coaching vs Usual care (changes to 12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Quality of life - Preventative coaching vs Usual care (changes to 12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Absenteeism - Preventative coaching vs Usual care (12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

Preventative coaching (N = 76)

| | |
|---|---|
| **Brief name** | Preventative coaching intervention for employees at risk of sickness absence due to psychosocial health complaints<br><br>(page 766) |
| **Rationale/theory/Goal** | Sickness absence due to psychosocial health complaints such as stress, depression and fatigue, accounts for up to one-third of all sickness absences in the western world . Once on sick leave, employees may find it difficult to re-engage with work. Early identification of employees at risk of sickness absence and early intervention to prevent such absence may prove an effective strategy. Most workplace interventions are 'curative' in nature but preventative coaching focuses on enhancing wellbeing and performance and managing stress in employees who are not on sick leave and whose problems are relatively mild. The coaching involves the work supervisor and focuses on work-related issues or those involving work and personal issues.<br><br>(pages 765-766) |
| **Materials used** | • Coaching protocol<br>• Checklists detailing the main features of each session and the problems to be addressed.<br><br>(Page 766) |
| **Procedures used** | The session contents were as follows:<br><br>• Session 1: Introductory interview to discuss coaching and personal objectives and to formulate the overall problem. At the end of this session the employee had to commit to attend all sessions.<br>• Session 2: A 3 way session involving the employee, their related supervisor and the coach. The objectives were to set up a plan to tailor the intervention to the employee, having communicated the problem to the supervisor and heard any essential organisational objectives from them. |

| | |
|---|---|
| | • The following 4-6 sessions: In individual meetings the employee and coach focused on the main problem and any underlying issues. This included identifying underlying behavioural characteristics and preventative coaching to lead to behavioural change.<br>• Final session : A further 3 way meeting between coach, employee and their related supervisor in which they evaluated the programme and discussed how continuation of changes initiated during coaching could be supported in the workplace.<br><br>(Page 766-767). |
| **Provider** | 8 coaches provided by an external organisation (Capability)<br><br>(page 766) |
| **Method of delivery** | Individual face-to-face sessions between coach and employee, with the exception of the two 3 way sessions which also included the related supervisor.<br><br>(page 766-767) |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | 7-9 x 1 hour sessions over a period of 6 months<br><br>(Page 766) |
| **Tailoring/adaptation** | After the first 2 sessions, the focus was on identifying the employee's behavioural characteristics and using the coaching techniques to change behaviours.<br><br>(Page 767) |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**Preventative coaching**

Usual care (N = 75)

| | |
|---|---|
| **Brief name** | Usual care<br><br>(page 766) |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not applicable |
| **Procedures used** | Participants were free to access the usual care offered by<br>in their company, for example  consultation with an occupational physician, or social worker when required.<br><br>(Page 767) |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |

| | |
|---|---|
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

Usual care

## D.11 Ebert, 2015

| | |
|---|---|
| **Bibliographic Reference** | Ebert, David D; Berking, Matthias; Thiart, Hanne; Riper, Heleen; Laferton, Johannes A C; Cuijpers, Pim; Sieland, Bernhard; Lehr, Dirk; Restoring depleted resources: Efficacy and mechanisms of change of an internet-based unguided recovery training for better sleep and psychological detachment from work.; Health psychology : official journal of the Division of Health Psychology, American Psychological Association; 2015; vol. 34s; 1240-1251 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | World Health Organization International Clinical Trial Registry No. DRKS00004984. |
| **Study start date** | May-2013 |

| | |
|---|---|
| **Study end date** | Nov-2014 |
| **Aim** | To investigate the effectiveness of an unguided recovery intervention in teachers with heightened levels of work-related rumination and impaired sleep. |
| **Country/geographical location** | Germany Nordrhein-Westfalen |
| **Setting** | Workplace<br>• Public sector<br>• Education<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • Primary, secondary, or vocational school teachers<br>• over the age of 18,<br>• currently employed,<br>• experiencing insomnia symptoms as measured by a score of >/=15 on the Insomnia Severity Index (ISI),<br>• experiencing low levels of psychological detachment from work as measured by a score of >/=15 on the Cognitive Irritation subscale of the Irritation Scale (IS)<br>• access to the Internet |
| **Exclusion criteria** | • receiving psychological help for their sleep problems or<br>• showing suicidal ideation (Beck Depression Inventory—II, Item 9, >1). |
| **Method of randomisation** | Participants meeting inclusion and none of the exclusion criteria were randomly allocated to the study using an automated computer-based random integer generator (randlist). |
| **Method of allocation concealment** | Not reported |

| | |
|---|---|
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation meant that 128 teachers were needed in order to be able to detect an effect size of d = 0.50 at posttreatment based on a power (1 - β) of 0.80 in a two-tailed test with α = 05.<br>• Differences in change from baseline to post-treatment between arms were assessed using analysis of covariance with baseline levels as covariates.<br>• Within- and between-groups Cohen's d and its 95% confidence intervals (CIs) were calculated as a measure of effect size on the basis of differences between baseline and follow-up scores, standardized by the pooled standard deviation of the change scores<br>• Intention-to-treat undertaken with multiple imputation with 100 estimate per missing value was using to handle missing data. |
| **Attrition** | ITT undertaken;<br><br>100% received the intervention (n=64)<br><br>100% allocated to control (n=64);<br><br>In the intervention group 76.6% and 67.19% respectively provided a questionnaire and sleep diary data at 8 weeks;<br><br>In the control group 79.7%. and 76.56% respectively provided a questionnaire and sleep diary data at 8 weeks;<br><br>In the intervention group 62.5% provided a questionnaire at 6 months<br><br>No data were provided regarding the control group CC at 6 months. |
| **Assessments and timepoints** | The following assessments were made at<br><br>• baseline<br>• 8 weeks (post-intervention) |

| | |
|---|---|
| | • 6 months (follow-up intervention only)<br><br>Primary outcome<br><br>• Insomnia severity using ISI<br><br>Secondary outcomes<br><br>• Depression using CES-D<br>• work-related strain/rumination (Cognitive Irritation Scale [CI]<br>• worrying (Penn State Worry Questionnaire, Ultra Brief Version, past week [PSWQ-PW]<br>• recovery experiences (Recovery Experience Questionnaire)<br>• frequency of recovery activities per week (Recreation Experience and Activity Questionnaire;)<br>• sleep quality (Pittsburgh Sleep Quality Index)<br>• sleep effort (Glasgow Sleep Effort Scale [GSES]<br>• sleep diary<br>• days with insomnia<br>• user satisfaction |
| **Study limitations (author)** | Sample of highly educated, mostly female teachers; elaborate study inclusion process may have led to self-selected inclusion of more motivated individuals; 6-Month follow-up was only assessed in the IC and not in the CC; Use of self-report; did not assess co-treatments at baseline or follow-up in terms (sleep medication) and not controlled for it in the statistical analysis; sample size did not allow examination of more complex mediation mechanisms; unclear which elements of this multicomponent intervention were the most successful in contributing to the effect of the intervention and which elements are not as effective. |
| **Study limitations (reviewer)** | Lack of detail regarding allocation concealment and assessor blinding |
| **Source of funding** | National Institutes of Health (NIH) Office of Behavioral and Social Sciences Research (OBSSR) |

**Study arms**

GET.ON Recovery (N = 64)

Internet-based recovery training

Waiting list (N = 64)

**Characteristics**

**Arm-level characteristics**

| Characteristic | GET.ON Recovery (N = 64) | Waiting list (N = 64) |
|---|---|---|
| **Age** (years)<br><br>Mean (SD) | 48.4 (9.9) | 46 (10.6) |
| **Female**<br><br>Sample size | n = 45 ; % = 70.3 | n = 50 ; % = 78.1 |
| **Caucasian**<br><br>Sample size | n = 64 ; % = 100 | n = 64 ; % = 100 |
| **On sick leave**<br><br>Sample size | n = 2 ; % = 3.1 | n = 1 ; % = 1.6 |
| **Primary**<br><br>Sample size | n = 23 ; % = 35.9 | n = 16 ; % = 25 |
| **Secondary**<br><br>Sample size | n = 41 ; % = 64.1 | n = 48 ; % = 75 |

**Outcomes**

**Study timepoints**

Baseline

0 week (Post intervention (8 weeks after baseline))

**Employee outcomes**

| Outcome | GET.ON Recovery, Baseline, N = 64 | GET.ON Recovery, 0 week, N = 64 | Waiting list, Baseline, N = 64 | Waiting list, 0 week, N = 64 |
|---|---|---|---|---|
| **Mental wellbeing**<br>Reported as work-related strain/rumination (Cognitive Irritation Scale)<br><br>Mean (SD) | 17.94 (2.68) | 12.64 (4.65) | 18.77 (2.14) | 17.02 (3.39) |
| **Job stress**<br>Reported using worrying (Penn State Worry Questionnaire, Ultra Brief Version, past week [PSWQ-PW]<br><br>Mean (SD) | 10.27 (4.27) | 5.87 (3.18) | 10.77 (3.67) | 8.44 (3.79) |
| **Mental health symptoms**<br>Reported as depression (CES-D)<br><br>Mean (SD) | 21.13 (7.61) | 13.17 (6.85) | 22.65 (7.08) | 19.22 (13.17) |

Mental wellbeing - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing - GET.ON Recovery vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Job stress - GET.ON Recovery vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Mental health symptoms - GET.ON Recovery vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Study arms**

Control (N = 64)

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | This study aimed at strengthening the evidence base for Internet-based recovery interventions by investigating the effectiveness of an unguided recovery intervention in teachers with heightened levels of work-related rumination and impaired sleep. It also aimed to investigate a number of assumed mechanisms of change. |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable. |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not reported. |
| **Unforeseen modifications** | Not reported. |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

| | |
|---|---|
| **Other details** | Not reported. |

Waiting list control

**GET.ON Recovery (N = 64)**

| | |
|---|---|
| **Brief name** | Internet-based recovery training |
| **Rationale/theory/Goal** | Based on cognitive model of insomnia, “the attention-intention-effort pathway” and based on the principles of health behavior change specified in the Health Action Process Approach [ P1242] |
| **Materials used** | Online sleep recovery diary and a hard copy version for participants who did not want to log on daily.<br><br>A technical support hotline via email/phone |
| **Procedures used** | The programme consisted of six interconnected sessions with participants being continuously asked to review their progress with applying the techniques and to set themselves goals for the next week. Participants were encouraged to keep a daily online recovery diary.<br><br>The sessions included articles and exercises, video and audio clips and focused on:<br><br>Session 1 - psychoeducation on recovery from work-caused stress (the connection between sleep ,psychological detachment, recreational activities) and sleep hygiene<br><br>Session 2: stimulus control and sleep restriction<br><br>Session 3: setting boundaries (practical steps to<br>distinguish work from private life and to help foster psychological detachment from work. Keeping a 'gratitude journal' before going to sleep to focus attention on pleasant experiences and divert from fixation on ruminative thoughts<br><br>Session 4: psychoeducation on work-related rumination and worrying, their effects on sleep, and strategies to overcome them |

| | |
|---|---|
| | Session 5: metacognitive techniques e.g. detached mindfulness and attention training in order to cope with perseverative cognitions<br><br>Session 6: future plans - reflections on strategies that were helpful and which the [participant wants to continue to apply in future daily routines. |
| **Provider** | University. |
| **Method of delivery** | Online. |
| **Setting/location of intervention** | Online. |
| **Intensity/duration of the intervention** | Six sessions, each taking approximately 45 to 60 minutes to complete Participants were advised to complete one session each week . |
| **Tailoring/adaptation** | Not reported. |
| **Unforeseen modifications** | Not reported. |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | In some sessions adherence to specific exercises was checked by asking participants in subsequent sessions if they had carried out the exercises 'completely', 'partly' or 'not at all'.<br><br>Completely (N) Partly (N) Not at all (N)<br><br>Session 2 29 20 1<br><br>Session 3 20 27 0 |

| | |
|---|---|
| | In addition, for carrying out sleep restriction between Sessions 2 and 3, 36 participants said they had been successful 'most days' but 10 said they seldomly succeeded or not at all. |
| **Other details** | Not reported. |

Internet-based recovery training - GET.ON Recovery

## D.12 Ebert, 2014

**Bibliographic Reference** Ebert, David Daniel; Lehr, Dirk; Bos, Leif; Riper, Heleen; Cuijpers, Pim; Andersson, Gerhard; Thiart, Hanne; Heber, Elena; Berking, Matthias; Efficacy of an internet-based problem-solving training for teachers: results of a randomized controlled trial.; Scandinavian journal of work, environment & health; 2014; vol. 40 (no. 6); 582-96

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | ISRCTN15635876 |
| **Study start date** | Apr-2012 |
| **Study end date** | Jun-2013 |
| **Aim** | The purpose of this study was to evaluate the efficacy of internet-based problem-solving training (iPST) for teachers with a heightened level of depressive symptoms. |
| **Country/geographical location** | Germany |
| **Setting** | Workplace<br>• Public sector<br>• Educational sector<br>• Size - Not specified |

| | |
|---|---|
| | • Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • a score of ≥16 on the Center for Epidemiologic Studies Depression Scale (CES-D)<br>• be a working teacher<br>• have sufficient German language (reading and writing) skills<br>• have no notable suicidal risk as indicated by a score of <2 on item 9 of the Beck Depression Inventory (BDI) (2="I'd like to kill myself", 3="I'd kill myself if I had a chance"). |
| **Exclusion criteria** | Not specified |
| **Method of randomisation** | Computer-based random integer generator (randlist). |
| **Method of allocation concealment** | Independent researcher performed the randomisation |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • The sample size was calculated to be able to detect a moderate effect at the post-treatment time point based on a power (1-β) of 0.80 in a two-tailed test, α=0.05.<br>• Mean and Standard Deviation; Chi square; t-test; mixed-effects models (MEM) of change;<br>• Analyses were based on intention-to-treat (ITT) procedures. Missing data were imputed using a Markov Chain Monte Carlo multivariate imputation algorithm with 10 estimations per missing value. |
| **Attrition** | Out of 75 participants in the iPST group, 70 (93%) completed at least one lesson, 62 (83%) completed two lessons, 56 (75%) completed three lessons, and 52 (70%) completed four lessons in the training program. Only 45 (60%) completed all five lessons of the training. Attrition was not significantly associated with any specific session ($Chi^2$=1.67; df=4; P=0.79). |

| | |
|---|---|
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• 7 weeks (endpoint)<br>• 3 months (after baseline)<br>• 6 months (after baseline<br><br>Primary outcome<br><br>• Depressive symptoms (CES-D)<br><br>Secondary outcomes<br><br>• General self-efficacy (General Self-Efficacy Scale)<br>• Work-related self-efficacy (Teacher Self-Efficacy Scale)<br>• Burnout (Maslach Burnout Inventory)<br>• Stress (Perceived Stress Questionnaire)<br>• Worrying (Penn State Worry Questionnaire)<br>• Health -related quality of life (SF-12 Health Survey)<br>• Absenteeism (self-reported sick leave during the past four weeks and self-rated amount of total days on sick leave during the past four weeks.) |
| **Study limitations (author)** | Generalisability outside of highly educated teachers; assessments relied exclusively on self-reported impairment at particular time points; did not assess treatment-as-usual utilization (eg, psychological or pharmacological co-treatment) of participants during the study period. |
| **Study limitations (reviewer)** | Methods for allocation concealment not outlined; Unclear if study assessors/authors were blinded to allocations; |
| **Source of funding** | European Union funded this study (EU EFRE: ZW6-80119999, CCI 2007DE161PR001) |

**Study arms**

Problem-solving training (N = 75)

Internet-based problem-solving training (iPST)

Waiting list (N = 75)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Problem-solving training (N = 75) | Waiting list (N = 75) |
|---|---|---|
| **Age** (years)<br>Due to missing data - n=125 for age<br><br>Mean (SD) | 46.4 (9.2) | 47.8 (7.3) |
| **Female**<br><br>Sample size | n = 62 ; % = 83.3 | n = 63 ; % = 84 |
| **Male**<br>calculated by reviewer<br><br>Sample size | n = 13 ; % = 16.7 | n = 12 ; % = 16 |

**Outcomes**

**Study timepoints**

Baseline

19 week (after endpoint (6 months after baseline))

**Employee outcomes**

| Outcome | Problem-solving training, Baseline, N = 75 | Problem-solving training, 19 week, N = 75 | Waiting list, Baseline, N = 75 | Waiting list, 19 week, N = 75 |
|---|---|---|---|---|
| **Mental health symptoms** Reported as depression using CES-D<br><br>Mean (SD) | 22.76 (9.24) | 15.87 (10.07) | 22.81 (9.15) | 19.91 (10.42) |
| **Job stress** Reported using Perceived Stress Questionnaire;<br><br>Mean (SD) | 0.66 (0.15) | 0.53 (0.19) | 0.67 (0.14) | 0.6 (0.16) |
| **Quality of life** Reported using SF-12 Mental health<br><br>Mean (SD) | 34.01 (8.62) | 42.59 (11.83) | 34.25 (9.51) | 39.55 (10.35) |

Mental health symptoms - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Quality of life - Polarity - Higher values are better

**Employer outcomes**

| Outcome | Problem-solving training, Baseline, N = 75 | Problem-solving training, 19 week, N = 75 | Waiting list, Baseline, N = 75 | Waiting list, 19 week, N = 75 |
|---|---|---|---|---|
| **absenteeism** (Total days on sick leave during the past four weeks.)<br><br>Mean (SD) | 2.8 (6.45) | 1.18 (4.27) | 1.61 (4.5) | 2.76 (7.75) |

Absenteeism - Polarity - Lower values are better

Absenteeism - Total days on sick leave during the past four weeks.

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Problem-solving training vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Job stress - Problem-solving training vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental wellbeing - Problem-solving training vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Absenteeism - Problem-solving training vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

Problem-solving training (N = 75)

| | |
|---|---|
| **Brief name** | Internet-based problem solving |
| **Rationale/theory/Goal** | Problem-solving therapy is based on the assumption that ineffective coping behavior causes psychopathology. Adverse health effects, especially depression and the creation of further problems, are expected if a person is not able to resolve stressful problems. PST aims to increase problem-solving skills and facilitate successful problem solving. |
| **Materials used** | Video introductions for each lesson |
| **Procedures used** | First, participants describe what really matters to them (eg, values, lifegoals). Second, the participants write down their current worries and problems, which are then divided into three categories: unimportant, important but solvable, and unsolvable problems. Third, for each of the three types of problems, a different strategy is developed to either solve or cope with the problem if it is unimportant or unsolvable. [P 584] |
| **Provider** | The eCoaches were psychologists and trained master's-level psychology students who followed feedback guidelines according a standardized manual. |
| **Method of delivery** | Delivered online [P 584] |
| **Setting/location of intervention** | Not reported |

| | |
|---|---|
| **Intensity/duration of the intervention** | Five lessons over 7 weeks [ |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**Internet-based problem-solving training (iPST)**

Waiting list (N = 75)

| | |
|---|---|
| **Brief name** | Waiting list [P 584] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | full access to treatment as offered by the workplace occupational health management programs and routine mental health |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |

| | |
|---|---|
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

## D.13 Ebert, 2016 a

| | |
|---|---|
| **Bibliographic Reference** | Ebert, DD; Heber, E; Berking, M; Riper, H; Cuijpers, P; Funk, B; Lehr, D; Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial.; Occupational and environmental medicine; 2016; vol. 73 (no. 5); 315-323 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | German clinical trials register (DRKS00005384) |

| | |
|---|---|
| **Aim** | To investigate the acceptability and effectiveness of iSMI compared to a 6-month wait-list control group (WLC) on stress, mental health and work-related outcomes in employees with heightened levels of perceived stress |
| **Country/geographical location** | Germany |
| **Setting** | Workplace<br>• Sector - Not specified<br>• Industry - Mix including health, economy, service, IT, social and other<br>• Size - Mix though small and medium sized companies were targeted<br>• Contract type - Mix of full- and part- time<br>• Seniority - Not specified |
| **Inclusion criteria** | • currently employed individuals<br>• above the age of 18 years<br>• with scores ≥22 on the Perceived Stress Scale (PSS-10)<br>• who had internet access<br>• sufficient skills in reading and writing German (self-report). |
| **Exclusion criteria** | • self-reported to have been diagnosed with psychosis or dissociative symptoms in the past<br>• showed a notable suicidal risk, as indicated by a score higher than 1 on Becks depression inventory item 9 (‘I feel I would be better off dead’). |
| **Method of randomisation** | Recruitment was via the occupational health programme and via newspaper articles and advertisements in the membership magazine; Randomisation was carried out using an automated computer-based random integer generator (Randlist) on 1:1 ratio and in block size of 2. |
| **Method of allocation concealment** | The allocation was performed by an independent third party who did not have any information about the participant. Participants were not blinded to study conditions. During the randomisation process, the allocation was concealed from participants, researchers involved in recruitment and e-coaches |
| **Unit of allocation** | Individual |

| | |
|---|---|
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Sample size of 264 was needed to detect an effect size of Cohen's d=0.35 based on a power (1−β) of 0.80 in a two-tailed test with an α of 0.05.<br>• Difference in means; Intention-to-treat principle (ITT);<br>• Multiple imputation was used to handle missing data. Ten single imputations of the missing values were calculated based on the valid data for all outcome measures at all assessment points<br>• Differences in perceived stress scores between iSMI and WLC groups were assessed using analysis of covariance (ANCOVA) with baseline scores as covariate; numbers needed to treat (NNT); |
| **Attrition** | ITT undertaken - 99% (iSMI) and 100% (WLC) analysed<br><br>@7 weeks post randomisation: 10% (iSMI) and 2% (WLC) attrition<br><br>@6 months post randomisation: 17% (iSMI) and 2% (WLC) attrition |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• T1 - baseline<br>• T2 - 7 weeks (post-treatment)<br>• T3 - 6 months (follow-up)<br><br>Primary outcome<br><br>• Perceived Stress Scale<br><br>Secondary outcomes<br><br>• Depression (Center for Epidemiological Studies' Depression Scale)<br>• Anxiety (Hospital Anxiety and Depression Scales, Anxiety subscale);<br>• Insomnia severity (Insomnia Severity Index)<br>• Worrying (Penn State Worry Questionnaire Ultra Brief Version-past week).<br>• Emotional exhaustion (Maslach Burnout Inventory, emotional exhaustion subscale)<br>• Work engagement (Utrecht Work Engagement Scale) |

| | |
|---|---|
| | • Detachment from work (Recovery Experience Questionnaire subscale)<br>• Absenteeism (Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry)<br>• Presenteeism (Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry) |
| **Study limitations (author)** | Study inclusion process might have led to greater inclusion of above-average motivated employees than one could expect outside of the controlled research context; Lack of consideration of the potentially negative effects of the intervention on participants e.g. reduced motivation to engage in psychological interventions in the future; open recruitment strategy was used so conclusions about the reach of the intervention are limited; Study population have substantial levels of self-reported stress results limiting generalisability; |
| **Study limitations (reviewer)** | Participants were not blinded to the study conditions during the randomisation process; As the majority of participants were recruited from the same company there is a potential for participant interaction during the intervention. |
| **Source of funding** | The BARMER GEK and European Union funded this study (EU EFRE: ZW6-80119999, CCI 2007DE161PR001). |

**Study arms**

Internet-based stress management + usual care (N = 131)

Self-guided internet-based stress management intervention (iSMI) - GET.ON

Waiting list + usual care (N = 132)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Internet-based stress management + usual care (N = 131) | Waiting list + usual care (N = 132) |
|---|---|---|
| **Age**<br><br>Mean (SD) | 41 (9) | 42 (9) |

| Characteristic | Internet-based stress management + usual care (N = 131) | Waiting list + usual care (N = 132) |
|---|---|---|
| **Female**<br>Sample size | n = 97 ; % = 74 | n = 91 ; % = 69 |
| **Male**<br>Sample size | n = 34 ; % = 26 | n = 41 ; % = 39 |
| **Caucasian/white**<br>Sample size | n = 108 ; % = 82 | n = 112 ; % = 85 |
| **Asian**<br>Sample size | n = 1 ; % = 1 | n = 0 ; % = 0 |
| **Prefer not to say**<br>Sample size | n = 23 ; % = 18 | n = 20 ; % = 15 |
| **High**<br>Sample size | n = 6 ; % = 5 | n = 5 ; % = 4 |
| **Middle**<br>Sample size | n = 39 ; % = 30 | n = 36 ; % = 27 |
| **Low**<br>Sample size | n = 86 ; % = 66 | n = 91 ; % = 69 |

**Outcomes**

**Study timepoints**

Baseline

19 week (follow-up (6 months after baseline))

**Employee outcomes**

| Outcome | Internet-based stress management + usual care, Baseline, N = 131 | Internet-based stress management + usual care, 19 week, N = 131 | Waiting list + usual care, Baseline, N = 132 | Waiting list + usual care, 19 week, N = 132 |
|---|---|---|---|---|
| **Job stress**<br>Reported as Perceived Stress Scale<br><br>Mean (SD) | 25.7 (5) | 17.5 (6.7) | 26.1 (4.1) | 21.8 (6.7) |
| **Mental health symptoms**<br>Reported as depression using CES-D<br><br>Mean (SD) | 25.1 (9.31) | 15.2 (9) | 23.9 (8.3) | 20.2 (10) |
| **Quality of life**<br>Reported as SF-36 Mental health<br><br>Mean (SD) | 33.2 (10) | 43.2 (9.9) | 33.5 (8.3) | 38.3 (10.1) |
| **Knowledge** (Mental health literacy)<br>Reported using Emotion Regulation Skills Questionnaire - Comprehension<br><br>Mean (SD) | 2.4 (1) | 3 (0.7) | 2.5 (0.9) | 2.6 (0.9) |

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Quality of life - Polarity - Higher values are better

Knowledge - Polarity - Higher values are better

**Employer outcomes**

| Outcome | Internet-based stress management + usual care, Baseline, N = 131 | Internet-based stress management + usual care, 19 week, N = 131 | Waiting list + usual care, Baseline, N = 132 | Waiting list + usual care, 19 week, N = 132 |
|---|---|---|---|---|
| **Job engagement**<br>Reported as Utrecht Work Engagement Scale<br><br>Mean (SD) | 3.1 (1.2) | 3.2 (1.1) | 3.2 (1.2) | 3.1 (1.2) |
| **absenteeism**<br>In relation to the previous 3 months.<br><br>Mean (SD) | 5.6 (12.4) | 3.6 (9.1) | 6.2 (12.5) | 4.9 (12) |
| **Presenteeism**<br>In relation to the previous 3 months<br><br>Mean (SD) | 16.1 (17.1) | 7.2 (9.6) | 14.2 (14.6) | 10.5 (12.2) |

Job engagement - Polarity - Higher values are better

absenteeism - Polarity - Lower values are better

Presenteeism - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Mental health symptoms - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Mental wellbeing - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Knowledge - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Job engagement - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Absenteeism - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Presenteeism - Internet-based stress management + usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Study arms**

iSMI (N = 132)

| | |
|---|---|
| **Brief name** | Self-guided internet-based and mobile-based stress management for employees. |
| **Rationale/theory/Goal** | Investigating the acceptability and effectiveness of iSMI compared to a 6-month wait-list control group (WLC) on stress, mental health and work-related outcomes, in employees with heightened levels of perceived stress |
| **Materials used** | Intervention used was the GET.ON Stress programme accessed online. |
| **Procedures used** | The intervention consisted of seven sessions composed of modules.<br><br>Psycho-education (session 1),<br><br>Problem-solving (sessions 2–3),<br><br>Emotion regulation (sessions 4–6),<br><br>Planning for the future (session 7)<br><br>There was an optional booster session 4 weeks after completion of the iSMI (session 8).<br><br>Additionally, participants were offered eight optional modules that were integrated into sessions 2–6, and could be chosen based on individual need and/or preference. |
| **Provider** | Not reported clearly - assumed to be the University research team. |
| **Method of delivery** | Online. |

| | |
|---|---|
| **Setting/location of intervention** | Online. |
| **Intensity/duration of the intervention** | Seven sessions, each of which could be completed in approximately 45–60 minutes<br><br>Eight optional modules were also offered that were integrated into sessions 2–6, and could be chosen based on individual need and/or preference. |
| **Tailoring/adaptation** | Not reported. |
| **Unforeseen modifications** | Not reported. |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | On average, participants in the iSMI group completed 4.4 modules (SD=2.8), or 62% of the intervention, and worked for 6.3 weeks (SD=6.9; range 0–34) with the intervention. |
| **Other details** | Not reported. |

Self-guided internet-based stress management intervention (iSMI) - GET.ON Stress based transactional model of stress and its distinction of problem-focused and emotion-focused coping; developed using evidence-based material on problem-solving and emotion regulation

WLC (N = 132)

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | Investigating the acceptability and effectiveness of iSMI compared to a 6-month wait-list control group (WLC) on stress, mental health and work-related outcomes in employees with heightened levels of perceived stress. |
| **Materials used** | Not applicable |
| **Procedures used** | Participants allocated to the waiting list had access to treatment as usual offered by workplace occupational health programmes and by routine healthcare services. |

| | |
|---|---|
| **Provider** | Not applicable . |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable. |
| **Unforeseen modifications** | Not applicable. |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | 6 months after randomisation, the control group received the intervention. |

Wait-list control group (WLC) - received the iSMI 6 months after randomisation but until then, had full access to TAU offered by workplace occupational health management programmes and routine healthcare services

## D.14 Ebert, 2016 b

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|---|---|
| **Bibliographic Reference** | Ebert, DD; Lehr, D; Heber, E; Riper, H; Cuijpers, P; Berking, M; Internet- and mobile-based stress management for employees with adherence-focused guidance: efficacy and mechanism of change.; Scandinavian journal of work, environment & health; 2016; vol. 42 (no. 5); 382-394 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | DRKS00005112 [p391] |
| **Aim** | Internet-based interventions without guidance have been found to be less effective than guided<br><br>interventions, and unguided stress management have failed to find significant effects. The aim of this study was to develop an internet-based stress management intervention iSMI, that need have only a minimal guidance to achieve a significant outcome. The approach taken was to focus on encouraging adherence to the self- help intervention, rather than on providing feedback unless it is requested by the participant, with the advantage of reducing time and cost per participant. This study explored the effectiveness of such an approach. |
| **Country/geographical location** | Germany |
| **Setting** | Workplace<br><br>• Mix of public and private<br>• Mix of industries (Service, economic, IT, healthcare, social and other)<br>• Size - Not specified<br>• Contract type - Mix of full- and part-time<br>• Seniority - Not specified |
| **Inclusion criteria** | • Currently employed individuals<br>• Aged 18 years or over<br>• Scores ≥22 on the Perceived Stress Scale (PSS-10)<br>• Access to the internet access<br>• Sufficient German skills in reading and writing to complete self-reports |
| **Exclusion criteria** | • Diagnoses with psychosis or dissociative symptoms in the past<br>• Showed a notable suicidal risk as indicated by a score >1 on Becks Depression Inventory (BDI) item 9. |

| | |
|---|---|
| **Method of randomisation** | Randomisation was carried out at an individual level, using an automated computer-based random integer generator (randlist). |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Analyses were carried out using SPSS version 22<br>• For all outcome variables. a significance level of 0.05 (two-sided) was used.<br>• Multiple imputation was used to handle missing data.<br>• Differences in change in the outcomes between intervention and control groups over time were assessed using repeated measures ANOVAs.<br>• If the overall effect became significant, individual differences in change from T1 to T2, and from T1 to T3 were investigated. Corrected F-values according to the conservative Greenhouse–Geisser adjustment method were reported.<br>• Cohen's d with 95% confidence intervals (95% CI) was calculated as a measure of effect size<br>• NNT was calculated. |
| **Attrition** | At assessment point T3 (6 months after randomisation):<br><br>• 97 (73.5%) of the Intervention group provided data and 35 (26.5%) were lost to assessment<br>• 122 (92.4%) of the control group provided data and 10 (7.6%) were lost to assessment<br>• An ITT analysis was carried out but 1 participant in the control group requested deletion of all data and so n= 131 for the control group. |
| **Assessments and timepoints** | The following assessments were made at these timepoints:<br><br>• T1 – baseline/pre-treatment<br>• T2 – post intervention (7 weeks post randomisation) |

| | |
|---|---|
| | • T3 – 6 months post randomisation<br><br>Primary outcome:<br><br>• Stress using Perceived stress measured by the Perceived Stress Scale (PSS-10) **(Reported)**<br><br>Secondary outcomes:<br><br>• Depression (Center for Epidemiological Studies' Depression Scale, CES-D, **(Reported)**<br>• Anxiety (Anxiety subscale of the Hospital Anxiety and Depression Scales, HADS-A.<br>• Insomnia severity (Insomnia Severity Index, ISI)<br>• Worrying (Penn State Worry Questionnaire-Ultra Brief Version-past week, PSWQ-PW.<br>• Emotional exhaustion (subscale emotional exhaustion of the Maslach Burnout Inventory, MBI- EE<br>• Work engagement (Utrecht Work Engagement Scale, UWES, **(Reported)**<br>• Psychological detachment from work (subscale of the Recovery Experience Questionnaire, REQ-PD<br>• Absenteeism from work **(Reported)**<br>• Presenteeism - number of "work cutback" days (reduced efficiency while feeling ill **(Reported)**<br>• Emotion regulation skills (Comprehension, acceptance, and emotional self-support subscales of the ERSQ-27<br>• Emotion regulation skills for general distress of the German Emotion Regulation Skills Questionnaire (using the Emotion Specific Version, ERSQES-GD, **(Reported)**<br>• Client satisfaction [German version of the Client Satisfaction Questionnaire, adapted for the online context, CSQ-8; |
| **Study limitations (author)** | • Possible selection bias as an open recruitment strategy was used recruiting participants from the general working population.<br>• The intervention was delivered from an external organisation (the university) and it is possible that employees may be less willing to use the intervention or react differently to it if it is delivered, from their employers' occupational health department. Future studies are needed that evaluate iSMI applying different recruitment strategies.<br>• A mediator analysis showed that emotion regulation skills relating to general distress are one important mechanism of change, but the design of the study l did not allow causal mechanisms to be explored<br>• Several of the mental-health-related outcome measures were highly correlated and may measure a similar latent construct (e.g, emotional exhaustion / depression). |

| | |
|---|---|
| | • It was not feasible to include any objective measurements including physiological measures (such as cortisol levels) which may have been beneficial.<br>• Although the current study replicated the results of the pilot study more studies are needed to reliably estimate the potential effects of iSMI in different target populations, e.g, among employees on sick leave. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | The BARMER GEK and the European Union (EU EFRE: ZW6-80119999, CCI 2007DE161PR001). |

**Study arms**

GET.ON Stress (N = 132)

internet and mobile based stress- management intervention (iSMI)

Waiting list (N = 132)

Treatment as usual

**Characteristics**

**Arm-level characteristics**

| **Characteristic** | **GET.ON Stress (N = 132)** | **Waiting list (N = 132)** |
|---|---|---|
| **Age**<br><br>Mean (SD) | 42.6 (9.4) | 43.2 (10.2) |
| **Male**<br>Calculated by reviewer<br><br>Sample size | n = 19 ; % = 14.4 | n = 18 ; % = 13.7 |

| Characteristic | GET.ON Stress (N = 132) | Waiting list (N = 132) |
|---|---|---|
| **Female**<br>Sample size | n = 113 ; % = 85.6 | n = 113 ; % = 86.3 |
| **Caucasian / white**<br>Sample size | n = 108 ; % = 81.8 | n = 109 ; % = 83.2 |
| **Asian**<br>Sample size | n = 1 ; % = 0.8 | n = 1 ; % = 0.8 |
| **Prefer not to say**<br>Sample size | n = 23 ; % = 17.4 | n = 21 ; % = 16 |
| **Full-time**<br>Sample size | n = 103 ; % = 78 | n = 97 ; % = 74 |
| **Part time**<br>Sample size | n = 28 ; % = 21.2 | n = 33 ; % = 25.2 |
| **On sick leave**<br>Sample size | n = 1 ; % = 0.8 | n = 1 ; % = 0.8 |
| **<10,000**<br>Sample size | n = 4 ; % = 3 | n = 6 ; % = 4.6 |
| **10,000–30,000**<br>Sample size | n = 37 ; % = 28 | n = 31 ; % = 23.7 |

| Characteristic | GET.ON Stress (N = 132) | Waiting list (N = 132) |
|---|---|---|
| **30 000–40 000**<br>Sample size | n = 33 ; % = 25 | n = 32 ; % = 24.4 |
| **40,000–50,000**<br>Sample size | n = 21 ; % = 15.9 | n = 26 ; % = 19.8 |
| **50,000–60,000**<br>Sample size | n = 19 ; % = 14.4 | n = 9 ; % = 6.9 |
| **60,000–100,000**<br>Sample size | n = 6 ; % = 4.5 | n = 9 ; % = 6.9 |
| **>100,000**<br>Sample size | n = 3 ; % = 2.3 | n = 3 ; % = 2.3 |

Data for control group reported as (n=131)

**Outcomes**

**Study timepoints**

Baseline

19 week (19 week follow-up (6 months after randomisation ))

**Employee outcomes**

| Outcome | GET.ON Stress, Baseline, N = 132 | GET.ON Stress, 19 week, N = 132 | Waiting list, Baseline, N = 132 | Waiting list, 19 week, N = 132 |
|---|---|---|---|---|
| **Mental health literacy**<br>Emotional regulation skills questionnaire - general distress (ERSQ-GD)<br><br>Mean (SD) | 1.88 (0.6) | 2.42 (0.57) | 1.84 (0.54) | 2.01 (0.65) |
| **Job Stress**<br>Perceived stress scale PSS10<br><br>Mean (SD) | 25.21 (4.59) | 17.05 (5.81) | 25.31 (4.16) | 22.24 (6.46) |
| **Mental health symptoms**<br>Depression using Center for Epidemiological Studies Depression Scale CES-D<br><br>Mean (SD) | 23.17 (9.27) | 15.52 (7.05) | 24.27 (8.39) | 22.75 (9.78) |
| **Absenteeism**<br>Days in previous 3 months<br><br>Mean (SD) | 4.87 (11.04) | 7.37 (14.71) | 3.59 (8.83) | 5.17 (10.52) |
| **Presenteeism**<br>Days in previous 3 months<br><br>Mean (SD) | 15.58 (14.92) | 10.31 (9.85) | 14.64 (14.12) | 12.02 (11.93) |
| **Job satisfaction - work engagement**<br>Utrecht Work engagement scale<br><br>Mean (SD) | 3.22 (1.36) | 3.41 (1.24) | 3.11 (1.25) | 3.21 (1.3) |

Mental health literacy - Polarity - Higher values are better

Job Stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Absenteeism - Polarity - Lower values are better

Presenteeism - Polarity - Lower values are better

Job satisfaction - work engagement - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Mental wellbeing - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Job Stress - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Absenteeism - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Presenteeism - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Job satisfaction - GET.ON Stress vs Waiting list (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion in the intervention dropped out compared to the control group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and imbalance in dropout rates)* |

**Study arms**

GET.ON Stress (N = 132)

| | |
|---|---|
| **Brief name** | GET.ON Stress [p384] |
| **Rationale/theory/Goal** | Lazarus' transactional model of stress [p384] and supportive accountability model [p385] |
| **Materials used** | If desired, the participants received automatic motivational text messages and exercises on their mobile phones [p385] |

| | |
|---|---|
| | Personalised written feedback [p385] |
| **Procedures used** | The intervention was supported by an e-coach applying an adherence-focused guidance concept , to support participants to adhere to the treatment modules, through adherence monitoring and feedback on demand [p385].<br><br>Reminders sent to participants who had not completed at least one session within 7 days. Personalised written feedback given within 48 hours [p385] |
| **Provider** | Occupational health management workers from insurance companies [p383] |
| **Method of delivery** | Internet and mobile-based [p383] |
| **Setting/location of intervention** | Not clear. Study reports intervention was delivered from an external institution (the university) [p391] |
| **Intensity/duration of the intervention** | 8 online modules, each lasting 45-60minutes [p385] over 7 weeks [p384] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

Internet and mobile based stress- management intervention (iSMI). Treatment as usual

**Waiting list (N = 132)**

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not reported |
| **Procedures used** | Employees had full access to any kind of interventions offered by workplace occupational health management programs and routine mental health services [p385] |
| **Provider** | Not reported |
| **Method of delivery** | Not reported |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Not reported |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

Treatment as usual

## D.15 Furukawa, 2012

| | |
|---|---|
| **Bibliographic Reference** | Furukawa, Toshi A; Horikoshi, Masaru; Kawakami, Norito; Kadota, Masayo; Sasaki, Megumi; Sekiya, Yuki; Hosogoshi, Hiroki; Kashimura, Masami; Asano, Kenichi; Terashima, Hitomi; Iwasa, Kazunori; Nagasaku, Minoru; Grothaus, Louis C; Telephone cognitive-behavioral therapy for subthreshold depression and presenteeism in workplace: A randomized controlled trial.; PLoS ONE; 2012; vol. 7 (no. 4) |

### Study details

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT00885014 |
| **Aim** | To reduce subthreshold depression in the workplace, through telephone based CBT, targeting both depression and associated decreased productivity (presenteeism). |
| **Country/geographical location** | Japan |
| **Setting** | Workplace<br>• Private sector<br>• Manufacturing industry<br>• Large organisation<br>• Mix of temporary and non-temporary<br>• Mix of supervisors, non-supervisors and others |
| **Inclusion criteria** | • Aged 20–57<br>• Male and female employees<br>• Currently employed full-time (including temporary staff)<br>• Expected to be employed full-time for 6 months after screening<br>• Scored 9 or greater on the K6 tool at screening (a 6 item self-report screening tool for common mental disorders) |

| | |
|---|---|
| | • Scored 10 or more on the BDI2 tool at screening (Beck Depression Inventory II) |
| **Exclusion criteria** | • Major depressive episode in the past month, as determined by Composite International Diagnostic Interview CIDI (dysthymia or major depression in partial remission were not excluded)<br>• Lifetime history of bipolar disorder, (determined by CIDI)<br>• Any substance dependency in the last 12 months, (determined by CIDI)<br>• Any other current mental disorder if it was the predominant aspect of the clinical presentation and needed treatment not offered in the study<br>• Currently receiving treatment for a mental health problem from a mental health professional<br>• 6 or more days of sick leave for a physical or mental condition in the past month<br>• Expected to be on pregnancy, maternity, or nursing leave within 6 months after screening |
| **Method of randomisation** | Participants were randomised to intervention or control groups by an independent clinical research co-ordinator (CRC). A random sequence was<br>generated independently by a study statistician, and was stratified for the severity of depression at baseline, presenteeism in the past month and<br>study site. The random sequence was blocked in varying lengths, unknown to the CRC and the principal investigators. |
| **Method of allocation concealment** | The random sequence was managed by a spreadsheet programme and allocation of a participant was only revealed after it was registered by the CRC. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation indicated that in order to detect an effect size of 0.40 or greater at an alpha error rate of 0.05 and a beta error rate of 0.20, the estimated sample size was 98 participants per arm. With the anticipated dropout rate of 10%, the necessary sample size was 108 participants per arm.<br>• Means in control and intervention groups were compared at 4-months follow-up using a t-test, permutation test, and a maximum likelihood mixed-effects model.<br>• The permutation test was used to get an exact distribution for the t-statistic based on a Monte-Carlo simulation with 1,000,000 replications. Permutations were done within the four strata defined by baseline BDI and baseline absenteeism. |

| | |
|---|---|
| | • The mixed model analysis, included all randomised individuals, including those with missing outcome data at 4 months<br>• The model was adjusted for baseline covariates including BDI-II, absenteeism, site, age and gender. The model accounted for missing data provided that the data were MAR (missing-at-random) conditional on the covariates and the baseline values of the outcome.<br>• As there was no baseline measurement for the overall satisfaction score, a regression was used to compare month 4 treatment means adjusting for the stratification variables, age and gender. |
| **Attrition** | Analysis was carried out on an intention to treat basis (N= 58 intervention and N= 60 control).<br><br>In the intervention group 51 of the 58 participants (87.9%) completed at least 4 sessions, with a mean (SD) of 7 (2.6) sessions being delivered.<br><br>91.4% of the Intervention group were retained at follow up at 4 months (6 lost to follow up)<br><br>In the control group 1 participant was lost to follow up (98.3% retained) |
| **Assessments and timepoints** | The following assessment were made at these timepoints<br><br>• baseline (Reported)<br>• 4 months (end of intervention) (Reported)<br>• 8 months for those on the waiting list who then received the intervention<br><br>Primary outcome:<br><br>• Beck Depression inventory II (BDI II) (Reported)<br>• WHO health and work performance questionnaire (HPQ) measuring absolute and relative presenteeism - (Reported)<br><br>Secondary outcomes |

| | |
|---|---|
| | • K6 self reported screening tool for mental health disorders<br>• Composite International Diagnostic Interview (CIDI) sections on alcohol use and mood disorders<br>• Service satisfaction - likert scale questions |
| **Study limitations (author)** | • A weak control condition (waiting list with access to the EAP).due to possible placebo effects or the non-specific general psychotherapeutic effects.<br>• Participants and therapists were not blinded to the allocation<br>• All primary outcomes were self reported and may have led to overestimations of effectiveness<br>• The short duration of the study (4 months) meant that the long term effects of the intervention could not be examined<br>• Lack of effect on presenteeism may be accounted for by lack of study power (small number of participants), limited scope to show improvement (as all participants were working), insensitivity of outcome measures and/ or true inefficacy of the intervention in addressing presenteeism. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | Sekisui Chemical Co. Ltd.. |

**Study arms**

Telephone CBT plus usual care (N = 58)

Waiting list plus usual care (N = 60)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Telephone CBT plus usual care (N = 58) | Waiting list plus usual care (N = 60) |
|---|---|---|
| **Age**<br>Mean (SD) | 39.4 (7.7) | 39.3 (8.2) |
| **Male**<br>Sample size | n = 47 ; % = 81 | n = 45 ; % = 75 |
| **Female**<br>Calculated by reviewer<br>Sample size | n = 11 ; % = 19 | n = 15 ; % = 25 |
| **Supervisory**<br>Sample size | n = 13 ; % = 22 | n = 18 ; % = 30 |
| **Non-supervisory and other**<br>Sample size | n = 45 ; % = 78 | n = 40 ; % = 70 |

**Outcomes**

**Study timepoints**

Baseline

0 month ((postvention after 4 months of intervention))

**Employee outcomes**

| Outcome | Telephone CBT plus usual care , Baseline, N = 58 | Telephone CBT plus usual care , 0 month, N = 58 | Waiting list plus usual care, Baseline, N = 60 | Waiting list plus usual care, 0 month, N = 60 |
|---|---|---|---|---|
| **Mental health symptoms**<br>Reported as Beck Depression Inventory-II.<br><br>Mean (95% CI) | *empty data* (*empty data* to *empty data*) | 11 (9.2 to 12.8) | *empty data* (*empty data* to *empty data*) | 15.7 (14 to 17.4) |
| **Presenteeism**<br>Reported as absolute presenteeism on World Health Organization Heath and Work Performance Questionnaire (HPQ)<br><br>Mean (95% CI) | *empty data* (*empty data* to *empty data*) | 62.4 (58.1 to 66.7) | *empty data* (*empty data* to *empty data*) | 59.9 (55.8 to 64) |

Mental health symptoms - Polarity - Lower values are better

Presenteeism - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Telephone CBT plus usual care vs Waiting list plus usual care (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | High *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Presenteeism - Telephone CBT plus usual care vs Waiting list plus usual care (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | High *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study details**

| | |
|---|---|
| **Unforeseen modifications** | |
| **Other details** | |

**Study arms**

Telephone CBT plus usual care (N = 58)

| | |
|---|---|
| **Brief name** | Telephone cognitive behavioural therapy tCBT plus usual care.<br><br>(page 3) |
| **Rationale/theory/Goal** | Subthreshold/ minor depression is highly prevalent in society and those suffering from it report more days sickness absence and less productivity while at work (presenteeism). Psychological treatments are well established for major depressive conditions with many of these being based on cognitive behavioural therapies (CBT). This study investigates the effectiveness of CBT delivered by telephone on subthreshold depression in the workplace and associated decreased productivity.<br><br>(Page 2) |
| **Materials used** | • Patient manual - shared by both participant and therapist - covering session details and space for participant's notes<br>• Therapist manual -- detailing order of the session, checklists and sample emails to send to participants<br>• Activity pocketbook - held by the participant, in which homework was collated and in which self monitoring results and thoughts could be noted.<br><br>(Page 3) |
| **Procedures used** | Each session was initiated with a brief assessment of depressive symptoms using the K6 questionnaire and a review of homework and the previous session. All sessions included an assessment of motivation, interest and confidence in applying homework to daily life. |

| | |
|---|---|
| | Specific session contents were as follows::<br><br>• Session 1 - Psychoeducation of the CBT model and rationale underlying the programme.<br>• Sessions 2 - 4 - Increasing pleasant experiences<br>• Sessions 5 - 7 - Identifying negative thoughts, distancing oneself from them and challenging them<br>• Session 8 - Review of the cognitive and behavioural skills covered and development of a self -care plan covering self monitoring, identification of and planning for high risk situations.<br><br>(Page 3) |
| **Provider** | Telephone counsellors were master, doctorate or postdoctoral level clinical psychologists, nurses or social workers or nurses with at least 1 year of clinical experience.<br><br>The counsellors underwent a minimum of 12 hours of didactic lectures followed by role plays, listened to a mimimum of 8 audiotaped sessions, and had two of their clients' therapy sessions (i.e.16 sessions) supervised by lead authors before they could partcipate as therapists in the study..<br><br>(Page 3) |
| **Method of delivery** | By telephone on an individual basis<br><br>(Page 3) |
| **Setting/location of intervention** | By telephone<br><br>(Page 3) |
| **Intensity/duration of the intervention** | 8 sessions of 30-45 minutes, designed to be delivered weekly.<br><br>(Page 3) |
| **Tailoring/adaptation** | Although the sessions were designed to last 30-45 minutes and delivered weekly, there was some variation in length of session according to need and some flexibility around weekly delivery of sessions, in order to fit around the participants work schedules, especially in the latter parts of the programme.<br><br>(Page 3). |

| | |
|---|---|
| **Unforeseen modifications** | None reported for the intervention group (See notes under 'other' for control group). |
| **Planned treatment fidelity** | Quality assurance of of the CBT telephone sessions<br>was undertaken by ongoing supervision and consultation as follows:<br><br>• All therapists had at least 3 out of their 8 sessions perparticipant supervised by auditotaped recordings throughout the study.<br>• Client adherence was checked by the independent clinical research co-ordinator and the therapist and their supervisor notified if: more than three weeks had elapsed between sessions; or K6 scores were 10 or more greater for any of the sessions 2 to 4 and 6 or more for sessions 5 onwards.<br>• Any questions arising could be discussed with the lead authors<br>• .Counsellors' meetings to discuss the progress of each participant' was held every two months.<br><br>(Page 3) |
| **Actual treatment fidelity** | Not reported |
| **Other details** | • Participants in both the intervention and control groups were able to access the Employee Assistance Programme (EAP) which was run by an external provider. The EAP was able to provide stress diganostics and reduction, via the web, telephone or email consultation. In addition both groups were free to access other support such as that from doctors or counsellors, from outside of the company.<br><br>(Page 3) |

Telephone CBT plus usual care

Waiting list plus usual care (N = 60)

| | |
|---|---|
| **Brief name** | Waiting list plus usual care. |

| | |
|---|---|
| | (page 3) |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not reported |
| **Procedures used** | • Participants were able to access the Employee Assistance Programme (EAP) which was run by an external provider. The EAP was able to provide stress diganostics and reduction.<br>• In addition they were free to access other support such as that from doctors or counsellors, from outside of the company.<br><br>(Page 3) |
| **Provider** | The Employee Assistance Programme was externally provided<br><br>(Page 3) |
| **Method of delivery** | The EAP was provided via the web, email or over the phone<br><br>(Page 3) |
| **Setting/location of intervention** | By telephone email or the web<br><br>(Page 3) |
| **Intensity/duration of the intervention** | Not reported |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | • Although it was originally planned that the waiting period for tthe control group would be 15 months this was reduced to 4 months after commencement of the study due to an initially low participation rate.<br><br>(Page 4) |

| | |
|---|---|
| | |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

Waiting list plus usual care

## D.16 Geraedts, 2014

| | |
|---|---|
| **Bibliographic Reference** | Geraedts, Anna S; Kleiboer, Annet M; Wiezer, Noortje M; van Mechelen, Willem; Cuijpers, Pim; Short-term effects of a web-based guided self-help intervention for employees with depressive symptoms: randomized controlled trial.; Journal of medical Internet research; 2014; vol. 16 (no. 5); e121 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NTR2993 |
| **Aim** | To test the effectiveness of a Web-based guided self-help course for employees with depressive symptoms. |
| **Country/geographical location** | The Netherlands |
| **Setting** | Workplace<br>• Public and Private<br>• Mix of industries including finance, security, and academic<br>• Size - Not specified |

| | |
|---|---|
| | • Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | Employees<br><br>• with elevated depressive symptoms as measured by a score of 16 or higher on the Center for Epidemiologic Studies Depression scale<br>• who were not on sick leave, and<br>• who had access to the Internet and an email address. |
| **Exclusion criteria** | • Partial or full work absenteeism,<br>• receiving treatment from the company's occupational health care at study entrance,<br>• unstable (<1 month) medication use for depressive symptoms, and<br>• having a legal labor dispute with the employer. |
| **Method of randomisation** | Block randomization was used with random blocks containing 4, 6, or 8 allocations using a computerized random number generator |
| **Method of allocation concealment** | Allocation was concealed. An independent researcher made the allocation schedule and the investigators had no knowledge of the schedule. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | Based on a power of 0.80, an alpha of.05, and an expected dropout percentage of 30%, we would need 100 participants per group to be able to show an effect-size Cohen's d of 0.50. Therefore, the total sample size was determined at 200.<br><br>Intention-to-treat analysis was conducted. Missing data were handled by multiple imputation via data augmentation. Per protocol analysis was conducted. |

| | |
|---|---|
| | Linear mixed modelling (LMM) was used to examine treatment differences: unadjusted and adjusted analyses (controlling for: age, gender, marital status, educational level, nationality, and working hours, as well as the baseline outcome score)<br><br>Subgroup analyses were conducted according to: educational level, age, gender, working full time versus part time, and high baseline score as defined by a score of ≥27 on the CES-D.<br><br>Sensitivity analysis was also conducted including LMM analyses without multiple imputations. |
| **Attrition** | 71 (61.2%) and 60 (51.7%) in the intervention group completed the study at 6 and 12 months respectively<br><br>86 (74.8%) and 69 (60%) in the control group completed the study at 6 and 12 months respectively |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Endpoint - 8 weeks after baseline<br>• Follow-up - 6 months after baseline (4 months after endpoint)<br>• Follow-up -12 months after baseline (10 months after endpoint)<br><br>Primary outcome<br><br>• Center for Epidemiological Studies Depression<br><br>Secondary outcomes<br><br>• Absenteeism using Trimbos and iMTA Questionnaire on Costs Associated with Psychiatric Illness<br>• WHO Health and Work Performance Questionnaire<br>• Maslach Burnout Inventory-<br>• Hospital Anxiety and Depression Scale anxiety subscale<br>• EQ-5D<br>• Pearlin Mastery Scale<br>• Netherlands Working Conditions Survey (social support items) |

| | |
|---|---|
| **Study limitations (author)** | • The study had a high attrition rate.<br>• Uncertainty whether the results can be generalized to the general working population or employees with a lower education level due to the fact that the study population was primarily Dutch white-collar workers with a high educational level.<br>• Low adherence to the intervention (only 57.8% completed at least 3 lessons of the intervention).<br>• The analyses on follow-up assessments have a lack of power. |
| **Study limitations (reviewer)** | • Lack on ITT data at 12 months |
| **Source of funding** | • Body@Work Research Center for Physical Activity, Work and Health, TNO VUMC, Amsterdam<br>• EMGO Institute for Health and Care Research, VU University Amsterdam, and<br>• VU University Medical Center Amsterdam |

**Study arms**

Web guided self-help (N = 116)

Usual care (N = 115)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Web guided self-help (N = 116) | Usual care (N = 115) |
|---|---|---|
| **Age** (years)<br><br>Mean (SD) | 43 (8.9) | 43.8 (9.6) |
| **Female**<br><br>Sample size | n = 77 ; % = 66.4 | n = 67 ; % = 58.3 |

| Characteristic | Web guided self-help (N = 116) | Usual care (N = 115) |
|---|---|---|
| **Male**<br><br>Sample size | n = 39 ; % = 33.6 | n = 48 ; % = 41.7 |
| **The Netherlands**<br><br>Sample size | n = 107 ; % = 92.2 | n = 113 ; % = 98.3 |
| **Other**<br><br>Sample size | n = 9 ; % = 7.8 | n = 2 ; % = 1.7 |
| **Low (primary and lower secondary)**<br><br>Sample size | n = 11 ; % = 9.5 | n = 5 ; % = 4.3 |
| **Middle (intermediate vocational education or high school,)**<br><br>Sample size | n = 31 ; % = 26.7 | n = 37 ; % = 32.2 |
| **HIgh (higher vocational education or university)**<br><br>Sample size | n = 74 ; % = 63.8 | n = 73 ; % = 63.5 |

**Outcomes**

**Study timepoints**

Baseline

6 month

12 month

**Employee outcomes**

| Outcome | Web guided self-help, Baseline, N = 116 | Web guided self-help, 6 month, N = 116 | Web guided self-help, 12 month, N = 116 | Usual care, Baseline, N = 115 | Usual care, 6 month, N = 115 | Usual care, 12 month, N = 115 |
|---|---|---|---|---|---|---|
| **Job stress**<br>Reported using MBI-exhaustion<br><br>Sample size | n = 116 ; % = 100 | n = 71 ; % = 61.6 | n = 60 ; % = 51.7 | n = 115 ; % = 100 | n = 115 ; % = 100 | n = 65 ; % = 56.5 |
| **Job stress**<br>Reported using MBI-exhaustion<br><br>Mean (SD) | 116.3 (1.2) | 2.7 (1.2) | 2.3 (1.4) | 3.3 (1.1) | 3 (1.2) | 2.5 (1.3) |
| **Mental health symptoms**<br>Reported as CES-D<br><br>Sample size | n = 116 ; % = 100 | n = 71 ; % = 61.6 | n = 60 ; % = 51.7 | n = 115 ; % = 100 | n = 86 ; % = 74.8 | n = 65 ; % = 56.5 |
| **Mental health symptoms**<br>Reported as CES-D<br><br>Mean (SD) | 25.7 (7.5) | 15.8 (10.6) | 13.8 (9.7) | 26.1 (7) | 18.3 (9.1) | 16.2 (10.7) |
| **Health care utilisation**<br>Reported as number seeking help<br><br>No of events | n = NR ; % = NR | n = 11 ; % = 9.5 | n = NR ; % = NR | n = NR ; % = NR | n = 23 ; % = 20 | n = NR ; % = NR |

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Employer outcomes**

| Outcome | Web guided self-help, Baseline, N = 116 | Web guided self-help, 6 month, N = 116 | Web guided self-help, 12 month, N = 60 | Usual care, Baseline, N = 115 | Usual care, 6 month, N = 115 | Usual care, 12 month, N = 65 |
|---|---|---|---|---|---|---|
| **Work performance** Reported as HPQ-4 - General<br><br>Sample size | n = 116 ; % = 100 | n = 61 ; % = 61.6 | n = 60 ; % = 51.7 | n = 115 ; % = 100 | n = 86 ; % = 74.8 | n = 65 ; % = 53.9 |
| **Work performance** Reported as HPQ-4 - General<br><br>Mean (SD) | 4.1 (1.6) | 3.6 (1.5) | 3.6 (1.5) | 4.3 (1.8) | 3.6 (1.5) | 3.7 (1.6) |
| **absenteeism** Reported as days absent in previous 6 months<br><br>Sample size | n = 116 ; % = 100 | n = 71 ; % = 61.6 | n = 60 ; % = 51.7 | n = 115 ; % = 100 | n = 86 ; % = 74.8 | n = 65 ; % = 53.9 |
| **absenteeism** Reported as days absent in previous 6 months<br><br>Mean (SD) | 1.8 (2.7) | 3.6 (9.4) | 7.3 (25.6) | 2 (3.3) | 3.6 (9.4) | 6.9 (23.3) |

Work performance - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Web guided self-help vs Usual care (12 month data)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures used were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental health symptoms-Web guided self-help vs Usual care (12 month data)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures used were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Health care utilisation - Web guided self-help vs Usual care (6 month data)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures used were self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Work performance - Web guided self-help vs Usual care (12 month data)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures used were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

Web guided self-help (N = 116)

| | |
|---|---|
| **Brief name** | Happy@Work [Geraedts 2013, P 4] |
| **Rationale/theory/Goal** | The intervention is based on problem-solving treatment and cognitive therapy and aims to prevent work-related stress with minimal guidance [ Geraerdts 2014, P 3] |
| **Materials used** | Weekly lesson and assignment followed by feedback within 3 days [Geraedts 2013, P 4] |
| **Procedures used** | Participants follow one lesson per week. Each lesson has a different theme, but always follows the same structure: information about the theme, examples, and assignments.<br><br>A new lesson can be started after receiving the feedback from the coach who will provide written weekly support via the website after a lesson has been completed. [Geraedts 2013, P 4] |
| **Provider** | Online with coaches [Geraedts 2013, P 4] |
| **Method of delivery** | Occupational social workers based in the company or, when the were not available, by master's level clinical psychology students. [Geraedts 2013, P 4]. |
| **Setting/location of intervention** | Workplace [Geraedts 2013, P 7] |
| **Intensity/duration of the intervention** | 6 weekly lessons with an option of 1 week extra time in case of delay. [Geraedts 2014 a, P 3] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | To ensure treatment fidelity, all feedback was reviewed by a supervisor before it was placed on the website. [Geraedts 2014 a, P 3] |
| **Actual treatment fidelity** | A random sample of 39 feedback texts was checked. The mean proportion was 72.2%. [Geraedts 2014 c, P 135-136] |

**Usual care (N = 115)**

| | |
|---|---|
| **Brief name** | Usual care [Geraedts 2013, P 4] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants were advised to consult their (occupational) physician or a psychologist if they wanted treatment for their depressive symptoms. [Geraedts 2013, P 4] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Workplace [Geraedts 2013, P 7] |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.17 Grime, 2004

| | |
|---|---|
| **Bibliographic Reference** | Grime, PR; Computerized cognitive behavioural therapy at work: a randomized controlled trial in employees with recent stress-related absenteeism.; Occupational medicine (Oxford, England); 2004; vol. 54 (no. 5); 353-359 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not specified |
| **Study start date** | Apr-1999 |
| **Study end date** | Oct-2001 |
| **Aim** | To evaluate the effect of an 8 week computerized cognitive behavioural therapy programme, 'Beating The Blues', on emotional distress in employees with recent stress-related absenteeism. |
| **Country/geographical location** | UK |
| **Setting** | Workplace<br>• Public sector<br>• Healthcare and local authority<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • 10 or more cumulative days of sickness absence due to stress, anxiety or depression in the past 6 months,<br>• attending an occupational health clinic<br>• scored 4 or more on the GHQ-12 (General Health Questionnaire). |

| | |
|---|---|
| **Exclusion criteria** | • Those with a psychotic illness |
| **Method of randomisation** | Randomisation sequence generated by a random number table |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Statistical power was calculated retrospectively using the outcomes observed<br>• Intention to treat analysis undertaken<br>• Analysis of variance (using SPSS) was used to obtain the mean differences in anxiety, depression and attributional style scores between the groups at each post-intervention time point, adjusting for baseline variability in the relevant scores for each measure, and for sex ratio |
| **Attrition** | In the intervention arm 16/24 (66.7%) participated to the end of treatment; In the control arm 23/24 (95.9%) participated to the end of treatment. |
| **Assessments and timepoints** | The following assessments were carried out at the times<br><br>• baseline<br>• 8 weeks (postvention)<br>• 1 month (follow-up)<br>• 3 months (follow-up)<br>• 6 months (follow-up)<br><br>Primary outcome was not specified<br><br>Outcomes were |

| | |
|---|---|
| | • Depression (Hospital Anxiety and Depression Scale)<br>• Anxiety (Hospital Anxiety and Depression Scale)<br>• Positive attributional style (Attributional Style Questionnaire)<br>• Negative attributional style (Attributional Style Questionnaire) |
| **Study limitations (author)** | • Small study numbers and low uptake; A suggestion that the intention to treat analysis "may have blunted the measurement of effect";<br>• Many in the control group also received potentially effective treatments, including CBT confounding conventional treatment effect and biasing effect estimates; |
| **Study limitations (reviewer)** | • Randomisation process poorly documented and lacks detail<br>• No evidence of blinding and allocation introducing potential selection and performance bias.<br>• Variation in the conventional treatment both in intervention and control arm across the sample can introduce performance bias and confounds treatment effects.<br>• Participants in the control arm skewed towards females (71%) |
| **Source of funding** | Not specified |

**Study arms**

Computerized CBT + usual care (N = 24)

'Beating the blues'

Usual care (N = 24)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Computerized CBT + usual care (N = 24) | Usual care (N = 24) |
|---|---|---|
| **Age** | 41 (10.83) | 37 (8.27) |

| Characteristic | Computerized CBT + usual care (N = 24) | Usual care (N = 24) |
|---|---|---|
| Mean (SD) | | |
| **Gender**<br><br>Custom value | Sex ratio F:M 11:13 | Sex ratio F:M 17:7 |
| **Mean (SD) HADS Anxiety score (baseline)**<br>Psychological questionnaire scores<br><br>Mean (SD) | 11.75 (3.87) | 14.04 (4.34) |
| **Mean (SD) HADS Depression score**<br>Psychological questionnaire scores<br><br>Mean (SD) | 7.96 (3.43) | 10.63 (4.13) |
| **Mean (SD) positive attributional style score**<br>Psychological questionnaire scores<br><br>Mean (SD) | 15.37 (1.28) | 14.18 (1.95) |
| **Mean (SD) negative attributional style score**<br>Psychological questionnaire scores<br><br>Mean (SD) | 13.92 (2.79) | 14.48 (1.99) |

**Outcomes**

**Study timepoints**

Baseline

6 month (post treatment)

**Employee outcomes**

| Outcome | Computerized CBT + usual care, Baseline, N = 24 | Computerized CBT + usual care, 6 month, N = 24 | Usual care, Baseline, N = 24 | Usual care, 6 month, N = 24 |
|---|---|---|---|---|
| **Mental health symptoms** Reported using HADS<br><br>Sample size | n = 24 ; % = 100 | n = 14 ; % = 58.3 | n = 24 ; % = 100 | n = 19 ; % = 79.2 |
| **Mental health symptoms** Reported using HADS<br><br>Mean (SD) | 7.96 (3.43) | 5.07 (4.57) | 10.63 (4.13) | 6.21 (4.22) |
| **Mental wellbeing** Reported as Negative attributional style<br><br>Sample size | n = 24 ; % = 100 | n = 14 ; % = 58.3 | n = 14 ; % = 100 | n = 19 ; % = 79.2 |
| **Mental wellbeing** Reported as Negative attributional style<br><br>Mean (SD) | 13.92 (2.79) | 12.38 (3.46) | 14.48 (1.99) | 14.14 (2.75) |

Mental health symptoms - Polarity - Lower values are better

Mental wellbeing - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Computerized CBT + usual care vs Usual care (6 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion of drop-outs in the intervention group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(self-reported outcomes and imbalance in drop-out rates)* |

**Mental wellbeing - Computerized CBT + usual care vs Usual care (6 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Higher proportion of drop-outs in the intervention group)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(self-reported outcomes and imbalance in drop-out rates)* |

**Study arms**

**Computerized CBT + usual care (N = 24)**

| | |
|---|---|
| **Brief name** | Computerized CBT |
| **Rationale/theory/Goal** | Based on cognitive behavioural therapy (CBT) is a recommended treatment where demand can often outstrip supply. CBT is well suited to computerization. Most employee assistance programmes have not been systematically evaluated and computerized CBT has not previously been studied in the workplace. Grime et al 2004 evaluates the effect of an 8 week computerized cognitive behavioural therapy programme, 'Beating The Blues', on emotional distress in employees with recent stress-related absenteeism, and explores the reasons for non-participation |
| **Materials used** | 'Beating The Blues' is an interactive computerized CBT programme. Cognitive and behavioural exercises are prescribed at the end of each module, and debriefed at the start of the next. A weekly progress report of distress self-ratings and |

| | |
|---|---|
| | suicidal ideation is generated for the user and for the supervising clinician. The programme concludes with a therapy map or programme review, goal setting and action planning.<br><br>Usual care was received between randomization and included medication, counselling, medication and counselling or other care. Counselling included CBT, solution-focused, person centred, psychoanalytic, psychodynamic and integrative therapy (including CBT), and transactional analysis |
| **Procedures used** | Beating The Blues' was loaded onto a stand-alone computer in a private room in the Occupational Health Department. Confidentiality was maintained with passwords. The author reviewed the weekly progress reports, to monitor for adverse events such as suicidal thoughts. Participants unable to complete the CBT programme were asked to complete the follow-up questionnaires if they could. Those attending in working hours were asked to get their line manager's permission. |
| **Provider** | Online [P 354] |
| **Method of delivery** | Online [P 354] |
| **Setting/location of intervention** | Occupational health clinics [P 354] |
| **Intensity/duration of the intervention** | 8 weekly sessions [ |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |

**Usual care (N = 24)**

| | |
|---|---|
| **Brief name** | Usual care [P 34] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants received usual care |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Occupational health clinics [p 34] |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |

| | |
|---|---|
| **Actual treatment fidelity** | Not applicable |

## D.18 Guo, 2020

**Bibliographic Reference** Guo, Yu-Fang Lam, Louisa Plummer, Virginia Cross, Wendy Zhang, Jing-Ping; A WeChat-based "Three Good Things" positive psychotherapy for the improvement of job performance and self-efficacy in nurses with burnout symptoms: A randomized controlled trial; JOURNAL OF NURSING MANAGEMENT; 2020; vol. 28 (no. 3); 480-487

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT 03645798 |
| **Study start date** | Apr-2015 |
| **Study end date** | Mar-2016 |
| **Aim** | To evaluate the effects of a WeChat-based “Three Good Things” on job performance and self-efficacy of clinical nurses with burnout symptoms. |
| **Country/geographical location** | China |
| **Setting** | Workplace:<br>• Sector: public<br>• Industry: healthcare<br>• Organisation size: large<br>• Contract type: full time |

| | |
|---|---|
| | • Seniority: not reported<br>• Income: professional (nurse) |
| **Inclusion criteria** | • Registered nurses from a Chinese tertiary general hospital who worked full-time and provided direct clinical care to patients.<br>• Nurses who scored higher than 1.5 on MBI-GS were included in the study. |
| **Exclusion criteria** | Nurses who had participated in the positive psychotherapies. |
| **Method of randomisation** | In total, 102 nurses were selected by simple randomized sampling from 197 nurses. Thereafter, using the stochastic tables' law, nurses in the intervention group and the control group were 49 and 53, respectively. |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Socio-demographic characteristics, job performance and self-efficacy were described by mean, standard deviations and percentage. The differences in the variables between the two groups before and after the intervention were examined by t test and χ2 test.<br>• The effects of intervention, time and time-intervention interaction on job performance and self-efficacy were tested by generalized repeated-measures analysis of variance (ANOVA). $p \leq .05$ was considered significant.<br>• Likely modified ITT analysis<br>• The sample size was calculated based on the formula “$\gamma = (\mu 1 - \mu 2)/\sigma$” (Polit & Hungler, 2006). In this study, α was 0.05, and 1 − β were 0.80. According to Fortney, Luchtherhand, Zakletskaia, Zgierska, and Rakel (2013), the μ1 were 31.9, μ2 were 26.4. And the uniting standard deviation σ was 8.2. The γ was calculated as 0.67. Referred to the score table of γ, the sample size was 32 for each group. |
| **Attrition** | Following the intervention, the remaining 73 nurses (33 [67%] from the intervention group and 40 [75%] from the control group) completed the post-investigation. |

| | |
|---|---|
| **Assessments and timepoints** | The following outcomes were measured:<br>• socio-demographic<br>• the Job Performance Scale<br>• the General Self-efficacy Scale (GSS)<br>• MBI-GS |
| **Study limitations (author)** | • Nurse participants were recruited from a single tertiary general hospital in Changsha, China. Therefore, findings of the study may not generalize to other populations.<br>• The study used WeChat software to implement 3GT intervention. As WeChat is commonly used among Chinese speakers, this intervention might be difficult to be transferred to other populations.<br>• The effect of WeChat-based 3GT was tested during the data collection at T1 and T2. The long-term effect of the intervention is unclear.<br>• Potential therapeutic effects in the experimental group were not recognized. |
| **Study limitations (reviewer)** | • Maslach Burnout Inventory outcomes were not reported despite these being measured<br>• Outcome measures were self-reported |
| **Source of funding** | Science and Technology Research Project of Hebei Higher Education Institutions |

**Study arms**

Positive psychotherapy (N = 49)

49 participants were randomised to receive positive psychotherapy.

Control (N = 53)

53 participants were randomised to a control group.

**Characteristics**

**Arm-level characteristics**

| Characteristic | Positive psychotherapy (N = 49) | Control (N = 53) |
|---|---|---|
| **Age**<br>Characteristics for completers only<br><br>Mean (SD) | 27.82 (5.42) | 28.73 (5.1) |
| **Men**<br><br>No of events | n = 0 ; % = 0 | n = 1 ; % = 2.5 |
| **Women**<br><br>No of events | n = 33 ; % = 100 | n = 39 ; % = 97.5 |
| **Less than $500**<br><br>No of events | n = 13 ; % = 39.4 | n = 8 ; % = 20 |
| **$501 to $835**<br><br>No of events | n = 6 ; % = 18.2 | n = 9 ; % = 22.5 |
| **$836 to $1,165**<br><br>No of events | n = 7 ; % = 21.2 | n = 15 ; % = 37.5 |
| **$1,166 to $1,500**<br><br>No of events | n = 6 ; % = 18.2 | n = 2 ; % = 5 |
| **More than $1,501**<br><br>No of events | n = 1 ; % = 3 | n = 6 ; % = 15 |

**Outcomes**

**Study timepoints**

Baseline

0 month (Outcomes were measured post-intervention.)

**Employee outcomes**

| Outcome | Positive psychotherapy, Baseline, N = 49 | Positive psychotherapy, 0 month, N = 49 | Control, Baseline, N = 53 | Control, 0 month, N = 53 |
|---|---|---|---|---|
| **Mental wellbeing** (10 to 40) Self-reported - General Self-efficacy Scale (GSS)<br><br>Sample size | n = 33 ; % = 67.3 | n = 33 ; % = 67.3 | n = 40 ; % = 75.5 | n = 40 ; % = 75.5 |
| **Mental wellbeing** (10 to 40) Self-reported - General Self-efficacy Scale (GSS)<br><br>Mean (SD) | 25.15 (5.74) | 30.64 (4.65) | 25.63 (5.82) | 25.3 (5.58) |

Mental wellbeing - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Mental wellbeing - Positive psychotherapy - Control**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns<br>*(Primary outcome of MBI not reported)* |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcomes and lack of primary outcome reporting)* |

**Study arms**

**Positive psychotherapy (N = 49)**

| | |
|---|---|
| **Brief name** | WeChat-based 3GT-positive psychotherapy [page 482] |
| **Rationale/theory/Goal** | Three Good Things is one of a family of positive psychotherapies developed as intentional interventions to cultivate positive cognition and enhance constructive behaviour. Conceived by Seligman and Csikszentmihalyi (2000), 3GT focuses on valuing people's positive experience relating to the past (e.g. happiness, satisfaction and achievement) to minimize the innate brain negative bias preference in the account of evolution. [page 481] |
| **Materials used** | WeChat app, designed by Chinese Tencent Holdings Limited Company in 2011, is a free and very commonly used communication tool (Mao, 2014). This tool provides several general and special functions for users, such as chatting platform, circle, friends searching and mini programmes recommendation (Farrar, 2013). According to the Tencent Financial Reports in 2015, WeChat has been provided in more than 200 countries and there are nearly 600 million users across the world. [page 482] |

| | |
|---|---|
| **Procedures used** | • Participants received the WeChat-based 3GT-positive psychotherapy.<br>• They were required to record three good things that were impressive each day. Then, they needed to answer two questions: “Why did these good things happen?” and “What was your role in bringing them about?” The intervention does not specify the good things, they can be inessential, general or significant.<br>• Nurses were firstly introduced to the intervention and the usage of the WeChat software. They then added the researchers as WeChat friends. They needed to record the three good things in the WeChat circle.<br>• Nurses had the right to choose whether they allow their records to be read by others. However, the record needed to be accessed by the researchers, as the researchers supervised the quality of the intervention implementation. To increase the adherence of 3GT, researchers sent reminder messages to all the nurses at 8 p.m. each evening to remind them to record three good things. The contents of the messages were exactly the same each time. “Do you have three good things that happened today? Remember to record them, thanks!” Nurses were encouraged to contact researchers whether they encountered any problems during the intervention process.<br><br>[pages 482 and 483] |
| **Provider** | Online app [page 482] |
| **Method of delivery** | Individual online intervention [page 482] |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Participants were invited to implement the intervention 5 days per week over the next 6 months. [page 482] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**Control (N = 53)**

| | |
|---|---|
| **Brief name** | Control group [page 482] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |

| | |
|---|---|
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.19 Heber, 2016

**Bibliographic Reference** Heber, Elena; Lehr, Dirk; Ebert, David Daniel; Berking, Matthias; Riper, Heleen; Web-Based and Mobile Stress Management Intervention for Employees: A Randomized Controlled Trial.; Journal of medical Internet research; 2016; vol. 18 (no. 1); e21

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | German Clinical Trials Register (DRKS): 00004749. |
| **Aim** | To evaluate the efficacy of a guided web- and mobile-based stress management training programme for employees. |
| **Country/geographical location** | Germany |
| **Setting** | Workplace<br>• Mix of public and private<br>• Mix of industries (social, IT, health, service, economy and other)<br>• Size - Not specified<br>• Contract type (mix of full-term and part-time)<br>• Seniority - Not reported |

| | |
|---|---|
| **Inclusion criteria** | Participants were recruited from the general working population via newspaper articles, announcements from the Ministry of Education and in particular via adverts in a large German health insurance members' magazine.<br><br>To participate, those applying had to:<br><br>• Be aged 18 years or over<br>• Be employed<br>• Score 22 or above on the Perceived Stress Scale 10 (PSS-10) |
| **Exclusion criteria** | • at risk of suicide (assessed according to Beck Suicide Item >1)<br>• who self-reported having been previously diagnosed with dissociative or psychotic symptoms. |
| **Method of randomisation** | Computerised random integer list using the web programme 'Randlist'. |
| **Method of allocation concealment** | Participants were informed about their allocation via email by an independent researcher |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation was based on an alpha of .05 (two-tailed test), and a power of 80% and so a sample size of 132 participants per group was necessary.<br>• All analyses were reported according to the Consolidated Standards of Reporting Trials (CONSORT) statement relating to eHealth<br>• Intention-to-treat (ITT) procedures were used and in addition, per-protocol and study completers-only analyses were reported.<br>• A significance level of .05 (two-sided) was used for all analyses.<br>• Analyses were carried out using IBM SPSS version 22.<br>• Multiple imputation was used to address missing data. Ten single imputations of the missing values were calculated based on the valid data for all outcome measures at all assessment points (T1, T2, T3, and T4), age and gender and were aggregated into a single overall estimate of the effects of the intervention. |

| | |
|---|---|
| | • Intervention and control groups were compared at 7 weeks and 6 months by analysis of covariance (ANCOVA) with baseline levels as covariates.<br>• Cohen's d with 95% confidence intervals (CIs) was calculated based on the imputed dataset by comparing the means and SDs of the intervention and control groups at respective time points.<br>• Clinical significance of reliable change was calculated according to the method of Jacobson and Truax using the following formula: 1.96 × SD1 × sqrt(2) × sqrt(1-rel). The participants were considered to have reliably changed if their PSS-10 score differed more than (+/-) 5.16 points from T1-T2 and T1-T3. |
| **Attrition** | • At T2 (post treatment / 7 weeks) 16/132 (12.1%) participants of the intervention group and 5/132 (3.8%) of the control group did not provide data.<br>• At T3 (6 months) 17 (12.9%) of the intervention group and 11 (8.3%) of the control group did not provide data.<br>• At T4 (12 months - for intervention group only) 40 (30.3%) participants did not provide data.<br>• analysis was carried out on an ITT basis (132 participants in both intervention and control arms). |
| **Assessments and timepoints** | The following assessments were made as these times<br><br>• T1 - baseline<br>• T2 - 7 weeks (post-treatment)<br>• T3 - 6 months (follow-up)<br>• T4 -12 months (follow-up) Intervention group only<br><br>Primary outcome<br><br>• Stress (Perceived Stress Scale-10)<br><br>Secondary outcomes<br><br>• Depression (Center for Epidemiological Studies' Depression Scale)<br>• Anxiety (Hospital Anxiety and Depression Scales - Anxiety subscale)<br>• Insomnia (Insomnia Severity Index)<br>• worrying (Penn State Worry Questionnaire, Ultra Brief Version-past week) |

| | |
|---|---|
| | • quality of life, (Short Form 12 (SF-12) PH (physical health) and MH (mental health))<br>• emotional exhaustion (Maslach Burnout Inventory)<br>• work engagement (Utrecht Work Engagement Scale<br>• psychological detachment (Recovery Experience Questionnaire - subscale)]<br>• mean days of absenteeism (Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry)<br>• mean days of presenteeism (Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry)<br>• Emotion regulation in terms of comprehension (-C), acceptance (-A), and self-support (-SS) (Emotion Regulation Skills Questionnaire)<br>• general distress (Emotion Regulation Skills Questionnaire Emotion Specific Version)<br>• Client satisfaction (Client Satisfaction Questionnaire) |
| **Study limitations (author)** | • Self-report measures only were assessed.<br>• As this was a targeted intervention, participants had relatively high baseline scores and were severely distressed on all measures. Conclusions cannot be drawn regarding participants with lower stress levels (eg, in a universal setting)<br>• Participants self-selected. The majority were female, and there was a slight overrepresentation of participants working in the social sector. This needs to be considered in terms of generalisability.<br>• Direct comparison studies are needed to determine the effect of the mobile phone element of the intervention by comparing the intervention with and without mobile phone support.<br>• The effects on physical health and work engagement were smaller than the effects for other outcome measures. For health this may be due to a global health measure (SF-12) being used rather than a more specific stress related measure. For work engagement this may have been due to the outcome measure not being sufficiently sensitive to change.<br>• Some improvements were also seen in the control group. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | European Union (EFRE) funding within the Lueneburg Innovation Incubator, TM 1.1 (CCI 2007DE161PR001). |

**Study arms**

Stress management + Usual care (N = 132)

iSMI GET.ON web /mobile based stress management intervention for employees

Waiting list + usual care (N = 132)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Stress management + Usual care (N = 132) | Waiting list + usual care (N = 132) |
|---|---|---|
| **Age**<br><br>Mean (SD) | 42.4 (10.7) | 44.2 (9.6) |
| **Female**<br><br>Sample size | n = 97 ; % = 73.5 | n = 96 ; % = 72.7 |
| **Male**<br>(Calculated by reviewer)<br><br>Sample size | n = 35 ; % = 26.5 | n = 36 ; % = 27.3 |
| **Caucasian / white**<br><br>Sample size | n = 110 ; % = 83.3 | n = 110 ; % = 83.3 |
| **Prefer not to say**<br><br>Sample size | n = 22 ; % = 16.7 | n = 22 ; % = 16.7 |
| **Full-time**<br><br>Sample size | n = 105 ; % = 79.5 | n = 99 ; % = 75 |
| **Part-time** | n = 25 ; % = 18.9 | n = 32 ; % = 24.2 |

| Characteristic | Stress management + Usual care (N = 132) | Waiting list + usual care (N = 132) |
|---|---|---|
| Sample size | | |
| **On sick leave**<br>Sample size | n = 2 ; % = 1.5 | n = 1 ; % = 0.8 |
| **Low**<br>Sample size | n = 3 ; % = 2.3 | n = 2 ; % = 1.5 |
| **Middle**<br>Sample size | n = 25 ; % = 18.9 | n = 31 ; % = 23.5 |
| **High**<br>Sample size | n = 104 ; % = 78.8 | n = 99 ; % = 75 |

**Outcomes**

**Study timepoints**

Baseline

19 week (19 weeks after endpoint (6 months post randomisation))

**Employee outcomes**

| Outcome | Stress management + Usual care, Baseline, N = 132 | Stress management + Usual care, 19 week, N = 132 | Waiting list + usual care, Baseline, N = 132 | Waiting list + usual care, 19 week, N = 132 |
|---|---|---|---|---|
| **Job stress**<br>Perceived Stress Scale (PSS10) over the last week | 25.89 (3.85) | 16.08 (6.03) | 25.15 (3.96) | 22.1 (5.81) |

| Outcome | Stress management + Usual care, Baseline, N = 132 | Stress management + Usual care, 19 week, N = 132 | Waiting list + usual care, Baseline, N = 132 | Waiting list + usual care, 19 week, N = 132 |
|---|---|---|---|---|
| Mean (SD) | | | | |
| **Mental health symptoms**<br>Depression using Center for Epidemiological Studies Depression Scale - (CES-D)<br><br>Mean (SD) | 23.34 (8.47) | 13.83 (7.71) | 23.77 (7.59) | 21.49 (8.48) |
| **Quality of life**<br>Short form 12 Questionnaire - mental health (SF12-MH)<br><br>Mean (SD) | 32.29 (8.44) | 43.38 (10.56) | 32.55 (8.08) | 36.54 (9.5) |
| **Job satisfaction - work engagement**<br>Utrecht work engagement scale (UWES)<br><br>Mean (SD) | 3.18 (1.26) | 3.46 (1.17) | 3.31 (1.15) | 3.16 (1.14) |
| **Absenteeism**<br>Days in previous 3 months<br><br>Mean (SD) | 4.93 (8.7) | 3.64 (6.7) | 4.4 (9.62) | 5.23 (12.1) |
| **Presenteeism**<br>Days in previous 3 months<br><br>Mean (SD) | 15.98 (14.27) | 11.32 (12.88) | 17.29 (16.51) | 11.47 (11.93) |

| Outcome | Stress management + Usual care, Baseline, N = 132 | Stress management + Usual care, 19 week, N = 132 | Waiting list + usual care, Baseline, N = 132 | Waiting list + usual care, 19 week, N = 132 |
|---|---|---|---|---|
| **Mental health literacy**<br>Emotional regulation skills questionnaire (Comprehension)<br><br>Mean (SD) | 2.48 (0.88) | 3.15 (0.64) | 2.47 (0.86) | 2.78 (0.8) |

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Quality of life - Polarity - Higher values are better

Job satisfaction - work engagement - Polarity - Higher values are better

Absenteeism - Polarity - Lower values are better

Presenteeism - Polarity - Lower values are better

Mental health literacy - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Stress management + Usual care vs Waiting list + usual care (19 week follow-up**)

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental health symptoms - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Quality of life - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Job satisfaction - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Absenteeism - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Presenteeism - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental wellbeing - Stress management + Usual care vs Waiting list + usual care (19 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**Intervention (N = 132)**

| | |
|---|---|
| **Brief name** | iSMI GET.ON Stress - Web-based and mobile stress management intervention for employees [P 2] |

| | |
|---|---|
| **Rationale/theory/Goal** | Web and mobile-based interventions for work-related stress have recently emerged and have various advantages including low costs, the potential for large-scale delivery and round the clock availability, However, the evidence base for Internet-based stress management interventions (iSMIs) is inconclusive, due to a limited number of RCTs being carried out and little is known about their long term efficacy.<br><br>Lazarus's transactional model of stress identifies two coping strategies. Problem-focused coping uses cognitive or behavioural efforts to deal with stressful situations in a positive manner, whereas emotion-focused coping focuses on managing emotions such as anger, or sadness in relation to the situation.<br><br>Using both problem- and emotion-focused coping skills as per Lazarus's model as two components within the same intervention appears promising but has not yet been introduced. This study tests an iSMI which combines both problem solving and emotion regulation. [P 2] |
| **Materials used** | Standardised manual for e-coaches, which provided guidance on preparing written feedback to participants. [P 3] |
| **Procedures used** | Accounts were activated by the research team and participants logged on by their email address and a chosen password. The content was based on the principles of behaviour change e.g. goal setting and action planning, The programme included interactive exercises and downloadable files including audio and video files<br><br>Session content was as follows:<br><br>• Session 1 - Psycho-education<br>• Sessions 2 -3 - Six-step procedure to systematically solve problems<br>• Sessions 4-6 - Introduction to emotion regulation techniques (muscle and breathing relaxation, accepting negative emotions, self-support in difficult situations)<br>• Session 7 - Future planning .<br><br>Within 48 hours of each session, an e-coach provided non-therapeutic feedback designed to encourage adherence and motivation.<br><br>In addition, participants could receive text messages to provide support during the day e.g. reminders to do breathing exercises, and could chose the frequency of these as either light (once daily) or intensive (2-3 times daily). [P 3] |
| **Provider** | All e- coaches had a degree in psychology [P 3] |

| | |
|---|---|
| **Method of delivery** | Via a secure web-based platform. [P 3] |
| **Setting/location of intervention** | Via the web or by mobile phone. [P 3] |
| **Intensity/duration of the intervention** | 7 sessions - participants were advised to complete 1-2 each week. The duration of each session was not specified, but e-coaches reported the average time spent for each feedback was 30 minutes.<br><br>A booster session was provided, 4 weeks after training was completed. [P 3] |
| **Tailoring/adaptation** | The intervention was specifically tailored to employees e.g. the characters used in the training and the optional information material related to work based topics such as time management, psychological detachment from work, sleep hygiene, breaks during work. [P 3] |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | • The coaches were given extensive coaching in preparing written feedback to participants<br>• A psychotherapist supervised the e-coaches<br>• The text messages were also intended to increase adherence. [P 3] |
| **Actual treatment fidelity** | It is reported that there were high levels of client adherence. [P 10] |
| **Other details** | Both intervention and control groups had access to treatment as usual [P 2] |

iSMI GET.ON Stress - Web-based and mobile stress management intervention for employees

**Control (N = 132)**

| | |
|---|---|
| **Brief name** | Waiting list with access to treatment as usual [P 2] |
| **Rationale/theory/Goal** | Not reported |

| | |
|---|---|
| **Materials used** | Not applicable |
| **Procedures used** | Not reported |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None reported |

Waiting list

## D.20 Jones, 2000

| | |
|---|---|
| **Bibliographic Reference** | Jones, Martyn C.; Johnston, Derek W.; Evaluating the impact of a worksite stress management programme for distressed student nurses: A randomised controlled trial; Psychology & Health; 2000; vol. 15 (no. 5); 689-706 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not specified |
| **Aim** | To examine if stress management training would reduce levels of emotional distress experienced by student nurses during a second series of hospital placements |
| **Country/geographical location** | UK |
| **Setting** | Workplace<br>• Public sector<br>• Healthcare industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Student nurses |
| **Inclusion criteria** | • Significant levels of distress experienced during an initial series of hospital placements, and<br>• following needs analysis (no further details give in paper but another paper cited) |
| **Exclusion criteria** | Not specified |
| **Method of randomisation** | Random number tables |

| | |
|---|---|
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • The minimum number of students per group was 35 in order to get a moderate effect size of 0.30, a= 0.05 and a power of 0.80,<br>• Mean and standard deviation; A series of repeated measures ANOVA was carried out using SPSS 6.1 for PC, with treatment and control group as between-group, and three measurement occasions as within-group factors |
| **Attrition** | Attrition was low and comparable between-groups with only 2 (6%) of the control group and 3 (7%) of the intervention group leaving the study by 3 month follow-up.<br><br>Data from students who attended 4 sessions and provided three complete sets of data at times 1-3, were included in the analytic procedures employed. |
| **Assessments and timepoints** | The following assessment were made at these timepoints<br><br>• Baseline<br>• 3 months (follow-up)<br>• 6 months (follow-up)<br>• 18 months (follow-up)<br><br>Primary outcome was not specified<br><br>Outcomes were<br><br>• General Health Questionnaire<br>• The State-Trait Anxiety Inventory (Form Y)<br>• Beck Depression Inventory<br>• Derogatis Stress Profile<br>• Beck and Srivastuva Stress Inventory |

| | |
|---|---|
| | • The “Ways of Coping Questionnaire”<br>• Sickness absence from the academic or clinical setting due to illness, notified by student to School<br>• Absence from academic or clinical setting, with no student notification |
| **Study limitations (author)** | • Intervention confounding: possibility that part, or all of the treatment effect had its main causal association with non-specific variables such as social support, etc<br>• long term follow-up (18 months after intervention meads effects may not be attributable to intervention<br>• Some redundancy in our broad range of affective outcome measures<br>• Potential threats to internal validity from the nature of the testing process, and the predominant use of paper and pencil evaluation methods.<br>• Limited generalisability to other Schools of Nursing and Midwifery |
| **Study limitations (reviewer)** | The lack of blinding and the lack of details regarding allocation concealment |
| **Source of funding** | Supported in part by a grant award from the General Nursing Council (Education) Fund 1983, managed by the National Board for Nursing and Midwifery for Scotland. |

**Study arms**

Stress management training (N = 40)

Waiting list (N = 39)

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 79)** |
|---|---|
| **Age** (years)<br><br>Mean (SD) | 27.3 (7.6) |

| Characteristic | Study (N = 79) |
|---|---|
| **Female**<br><br>Sample size | n = 68 ; % = 84.8 |
| **Male**<br><br>Sample size | n = 11 ; % = 15.2 |

**Outcomes**

**Study timepoints**

3 month

6 month (Post intervention (sickness and absence outcomes only))

18 month (18 months post-intervention on the morning of their final exam)

**Employee outcomes**

| Outcome | Stress management training, 3 month, N = 40 | Stress management training, 6 month, N = 40 | Stress management training, 18 month, N = 40 | Waiting list, 3 month, N = 39 | Waiting list, 6 month, N = 39 | Waiting list, 18 month, N = 39 |
|---|---|---|---|---|---|---|
| **Mental health symptoms**<br>State anxiety score<br><br>Sample size | n = 37 ; % = 92.5 | n = NR ; % = NR | n = 38 ; % = 95 | n = 37 ; % = 94.9 | n = NR ; % = NR | n = 38 ; % = 97.4 |
| **Mental health symptoms** | 45.9 (10.7) | NR (NR) | 47.6 (12.4) | 59.1 (6.2) | NR (NR) | 58.2 (13.3) |

| Outcome | Stress management training, 3 month, N = 40 | Stress management training, 6 month, N = 40 | Stress management training, 18 month, N = 40 | Waiting list, 3 month, N = 39 | Waiting list, 6 month, N = 39 | Waiting list, 18 month, N = 39 |
|---|---|---|---|---|---|---|
| State anxiety score<br><br>Mean (SD) | | | | | | |

Mental health symptoms - Polarity - Lower values are better

**Employer outcomes**

| Outcome | Stress management training, 3 month, N = 40 | Stress management training, 6 month, N = 40 | Stress management training, 18 month, N = 40 | Waiting list, 3 month, N = 39 | Waiting list, 6 month, N = 39 | Waiting list, 18 month, N = 39 |
|---|---|---|---|---|---|---|
| **Sickness absence**<br><br>Sample size | n = 38 ; % = 96 | n = 38 ; % = 96 | n = NR ; % = NR | n = 38 ; % = 97.4 | n = 38 ; % = 97.4 | n = NR ; % = NR |
| **Sickness absence**<br><br>Mean (SD) | 1.4 (2.5) | 2.6 (3.1) | NR (NR) | 2 (3.9) | 3.9 (6.6) | NR (NR) |

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Intervention vs Control (18 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Sickness absence - Stress management training vs Waiting list (6 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study arms**

**Stress management training (N = 40)**

| | |
|---|---|
| **Brief name** | Stress management training |
| **Rationale/theory/Goal** | The intervention adopted a transactional conceptualisation of the stress process targeted the situational stressors, cognitive appraisal and coping strategies of student nurses, focused therapeutic approaches at both individual and interface levels, and measured outcome at individual, interface and organisational levels. |
| **Materials used** | Didactic presentations in workshops<br><br>Standardised manual to guide session content<br><br>Student handouts |
| **Procedures used** | Six sessions, each consisting of:<br><br>• A brief 15 minute didactic presentation on a specifi coping skill<br>• Experiential learning encouraging the participants to apply the technique to academic, clinical and home life<br>• Individual and group reflection on the application of the techniques<br>• Formulaiton of plans to apply the techniques to sitiuations in real life e.g. exams<br>• Relaxation technique session<br><br>Skills covered included:<br><br>• Session 1 - self monitoring distress symptoms |

| | |
|---|---|
| | • Session 2 - problem solving strategies to change situations<br>• Session 3 - situational reappraisal<br>• Session 4 - time and self management skills<br><br>(Page 691-692) |
| **Provider** | Not specified |
| **Method of delivery** | Face to face sessions in groups not exceeding 14 students. |
| **Setting/location of intervention** | School of Nursing and Midwifery in the North East of Scotland [p 691] |
| **Intensity/duration of the intervention** | Six 2-hour sessions |
| **Tailoring/adaptation** | Not specified |
| **Unforeseen modifications** | Not specified |
| **Planned treatment fidelity** | Study does not refer to to the assessment of planned treatment fidelity, however each “run” of training had a separate “catch” group for participants who failed to attend every session. |
| **Actual treatment fidelity** | Not reported |
| **Other details** | All participants were made aware of the availability of travelling expenses (up to £20) and the criteria for entry into a £50 incentive “prize-draw”. This required attendance at all programme and data collection sessions.<br><br>(page 693) |

**Waiting list (N = 39)**

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | A group version of the programme for “wait-control” participants proved to be impractical due to busy timetable commitments at school and the beginning of a three shift system for many students during their clinical placements. As a result, students in the wait-control group subsequently received a distance version of the intervention. |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

## D.21 Kawakami, 1999

| | |
|---|---|
| **Bibliographic Reference** | Kawakami, N; Haratani, T; Iwata, N; Imanaka, Y; Murata, K; Araki, S; Effects of mailed advice on stress reduction among employees in Japan: a randomized controlled trial.; Industrial health; 1999; vol. 37 (no. 2); 237-242 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Study start date** | Oct-1993 |
| **Study end date** | Oct-1994 |
| **Aim** | To examine the effects of individualized mailed advice on reducing psychological distress, blood pressure, serum lipids, and sick leave of employees in a manufacturing plant in Japan. |
| **Country/geographical location** | Japan |
| **Setting** | Workplace<br>• Private sector<br>• Manufacturing industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority level not specified |
| **Inclusion criteria** | • employees in a manufacturing plant with psychological distress, defined as having a GHQ score of three or greater. |

| | |
|---|---|
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | Not reported |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | No information on a power calculation<br><br>No information on how missing data was dealt with<br><br>Analysis of variance (ANOVA) with repeated measurements was used to test the statistical significance of the intervention |
| **Attrition** | 48 out of 113 (42.5%) of the intervention group and 45 out of 113 (39.8%) of the control group completed all assessments |
| **Assessments and timepoints** | The following assessments were made at these times<br><br>• Baseline<br>• 12 months after baseline (follow-up)<br><br>Primary outcome was not specified<br><br>Outcomes were<br><br>• General Health Questionnaire<br>• Type A behaviour questionnaire<br>• Health check-up |

| | |
|---|---|
| **Study limitations (author)** | Not reported |
| **Study limitations (reviewer)** | High levels of loss to follow |
| **Source of funding** | • Ministry of Labour, Japan,<br>• Ministry of Education, Science, and Culture, Japan. |

**Study arms**

Advice (N = 113)

Advice delivered by mail

Control (N = 113)

No further information was provided

**Characteristics**

**Arm-level characteristics**

| **Characteristic** | **Advice (N = 113)** | **Control (N = 113)** |
|---|---|---|
| **Age** (years)<br>Reported for completers only<br><br>Mean (SD) | 36 (13) | 35 (13) |
| **Male**<br><br>Sample size | n = 66 ; % = 81.5 | n = 62 ; % = 80.5 |

| Characteristic | Advice (N = 113) | Control (N = 113) |
|---|---|---|
| **Female**<br><br>Sample size | n = 15 ; % = 18.5 | n = 15 ; % = 19.5 |

**Outcomes**

**Study timepoints**

Baseline

5 month (after advice mailed (12 months after baseline))

**Employee outcomes**

| Outcome | Advice, Baseline, N = 113 | Advice, 5 month, N = 113 | Control, Baseline, N = 113 | Control, 5 month, N = 113 |
|---|---|---|---|---|
| **Mental wellbeing** GHQ<br><br>Sample size | n = 81 ; % = 71.7 | n = 81 ; % = 71.7 | n = 77 ; % = 68.1 | n = 77 ; % = 68.1 |
| **Mental wellbeing** GHQ<br><br>Mean (SD) | 5.5 (2.4) | 3.5 (2.9) | 5 (2.2) | 3.6 (2.5) |

Mental wellbeing - Polarity - Lower values are better

**Employer outcomes**

| Outcome | Advice, Baseline, N = 113 | Advice, 5 month, N = 113 | Control, Baseline, N = 113 | Control, 5 month, N = 113 |
|---|---|---|---|---|
| **absenteeism**<br>Number of people who took sick-leave<br><br>No of events | n = 55 ; % = 67.9 | n = 53 ; % = 65.4 | n = 53 ; % = 67.5 | n = 48 ; % = 62.3 |
| **absenteeism**<br>Number of people who took sick-leave<br><br>Sample size | n = 81 ; % = 71.7 | n = 81 ; % = 71.7 | n = 77 ; % = 68.1 | n = 77 ; % = 68.1 |

Absenteeism - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing - Advice vs Control (5 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Absenteeism - Advice vs Control (5 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study arms**

Advice (N = 113)

| | |
|---|---|
| **Brief name** | Mailed advice [Abstract] |
| **Rationale/theory/Goal** | To reduce stress through provision of individualised information [P 239] |
| **Materials used** | Individualised information on A4 paper [P 239] |
| **Procedures used** | Mailed advice for stress reduction was sent to each participant in the intervention group, under the name of an cccupational physician of the factory.<br><br>Those who had no leisure-time physical activity were recommended to exercise or participate in sports.. Those who did not often eat green vegetables and those who did not eat breakfast regularly were encouraged to do so'. Those who consumed alcohol<br>every day (25%), were advised to reduce their frequency of drinking in order to recover faster from psychological distress. For those who indicated a type A score of 21 or greater a, brief description of type A behaviors and "time out" techniques to control these behaviors were introduced: 1) counting to 10 before speaking; (2) consulting someone else about what you are going to do before doing (3) waiting overnight to make an important decision; and<br>(4) using a relaxation technique<br><br>A relaxation technique was briefly introduced to all subjects in the intervention group [P 239] |
| **Provider** | Occupational health physician [P 239] |
| **Method of delivery** | Mailed advice [P 239] |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Not reported |
| **Tailoring/adaptation** | Not reported |

| | |
|---|---|
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Control (N = 113)**

| | |
|---|---|
| **Brief name** | Control group [Abstract] |
| **Rationale/theory/Goal** | No details provided |
| **Materials used** | No details provided |
| **Procedures used** | No details provided |
| **Provider** | No details provided |
| **Method of delivery** | No details provided |
| **Setting/location of intervention** | No details provided |
| **Intensity/duration of the intervention** | No details provided |
| **Tailoring/adaptation** | No details provided |

| | |
|---|---|
| **Unforeseen modifications** | No details provided |
| **Planned treatment fidelity** | No details provided |
| **Actual treatment fidelity** | No details provided |

## D.22 Kim, 2013

| | |
|---|---|
| **Bibliographic Reference** | Kim, S.H.; Schneider, S.M.; Bevans, M.; Kravitz, L.; Mermier, C.; Qualls, C.; Burge, M.R.; PTSD symptom reduction with mindfulness-based stretching and deep breathing exercise: Randomized controlled clinical trial of efficacy; Journal of Clinical Endocrinology and Metabolism; 2013; vol. 98 (no. 7); 2984-2992 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | ClinicalTrials.gov Identifier: NCT01462045. |
| **Aim** | This study investigated the underlying neuro-endocrinological mechanisms behind improvements in the severity of symptoms of PTSD, through measuring changes in cortisol levels associated with a mindfulness stretching and breathing programme. |
| **Country/geographical location** | USA |
| **Setting** | Workplace<br>• Public sector<br>• Healthcare industry<br>• Large organisation |

| | |
|---|---|
| | • Contract type - not specified<br>• Seniority - not specified |
| **Inclusion criteria** | • Employed as a nurse at the University of New Mexico hospital<br>• Score at least 28 on PTSD Checklist–Civilian version (PCL-C) and a score of 3 or higher on at least 1 item<br>• Aged over 18 |
| **Exclusion criteria** | • Inability to take part in the exercise programme<br>• Answering positively to any of the screening questions on the Physical Activity Readiness Questionnaire<br>• Current use of systemic glucocorticoid. |
| **Method of randomisation** | • Coin toss |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Analyses were carried out using an intention-to treat approach including all participants who were randomly assigned.<br>• Last-observation-carried-forward method was used by using baseline values to replace missing postintervention outcome values.<br>• Shapiro-Wilk W-tests were used for the assumption of normality<br>• t-tests were used to find between-group differences of the intervention, postintervention.<br>• To test for within-group difference repeated measures ANOVA was used or both groups at baseline and week 8. |

| | |
|---|---|
| | • Potential effects of confounders were tested using multivariate regression, using the covariates of age, gender, ethnicity, education, marital status, smoking status, body mass index, and nursing experience |
| **Attrition** | • In the intervention group there were no drop- outs<br>• In the control group 1 of the 11 (9%) participants dropped out |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Endpoint<br><br>Primary outcome<br><br>• PTSD Checklist–Civilian version<br><br>Secondary outcomes<br><br>• Serum cortisol<br>• Plasma ACTH<br>• serum DHEAS |
| **Study limitations (author)** | • Small number of participants, predominantly female nurses with PTSD symptoms. which may limit generalisability to males or individuals with PTSD related to combat.<br>• Lack of a PTSD diagnosis may also limit study validity. Although the PCL-C checklist has shown validity in screening for PTSD there may be issues with generalisability to individuals with clinically diagnosed PTSD<br>• Possibility that some subjects may have continued to practice the intervention between weeks 8 and 16<br>• Subjects with depression were not excluded and this may have increased cortisol levels for some subjects<br>• It is possible that there may have been a ceiling effect, that time may have allowed some improvement in symptoms or there may have been a Hawthorne effect. |

| | |
|---|---|
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | DHHS/NIH/NCATS UL1RR031977-01 and 5KL2RR031976-02,UNMClinical and Translational Science Center. |

**Study arms**

Mindfulness-based stretching and deep breathing (N = 11)

Mindfulness-based stretching and deep breathing

No intervention (N = 11)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Mindfulness-based stretching and deep breathing (N = 11) | No intervention (N = 11) |
|---|---|---|
| **Age**<br>Standardised Mean (SD) | 47.6 (7.7) | 45 (10) |
| **Female**<br>Sample size | n = 10 ; % = 91 | n = 11 ; % = 100 |
| **Male**<br>Calculated by reviewer<br>Sample size | n = 1 ; % = 9 | n = 0 ; % = 0 |
| **White - Non-Hispanic or latino**<br>Sample size | n = 6 ; % = 55 | n = 7 ; % = 64 |
| **Hispanic or Latino** | n = 4 ; % = 36 | n = 3 ; % = 27 |

| Characteristic | Mindfulness-based stretching and deep breathing (N = 11) | No intervention (N = 11) |
|---|---|---|
| Sample size | | |
| **African-American**<br>Sample size | n = 1 ; % = 9 | n = 0 ; % = 0 |
| **American Indian**<br>Sample size | n = 0 ; % = 0 | n = 1 ; % = 9 |
| **Graduate degree**<br>Sample size | n = 2 ; % = 18 | n = 2 ; % = 18 |
| **college degree**<br>Sample size | n = 9 ; % = 82 | n = 9 ; % = 82 |
| **Less than 5 years**<br>Sample size | n = 3 ; % = 27 | n = 2 ; % = 18 |
| **6-10 years**<br>Sample size | n = 0 ; % = 0 | n = 2 ; % = 18 |
| **11-15 years**<br>Sample size | n = 0 ; % = 0 | n = 0 ; % = 0 |
| **More than 15 years**<br>Sample size | n = 8 ; % = 73 | n = 7 ; % = 64 |

**Outcomes**

Study timepoints

Baseline

0 week (at endpoint)

**Employee outcomes**

| Outcome | Mindfulness-based stretching and deep breathing , Baseline, N = 11 | Mindfulness-based stretching and deep breathing , 0 week, N = 11 | No intervention, Baseline, N = 11 | No intervention, 0 week, N = 11 |
|---|---|---|---|---|
| **Job stress**<br>Reported as PTSD-checklist - Civilian version<br><br>Mean (SD) | 43.1 (11.2) | 24.3 (3.3) | 42.6 (12.7) | 41 (16.3) |

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Mindfulness-based stretching and deep breathing vs No intervention (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**Mindfulness-based stretching and deep breathing (N = 11)**

| | |
|---|---|
| **Brief name** | Mindfulness-based stretching and deep breathing (Page 2986) |
| **Rationale/theory/Goal** | Intensive care nurses are at high risk of post traumatic stress disorder (PTSD) due to exposure to factors such as high patient mortality levels and daily exposure to traumatic events. Although there has been some success with pharmacological interventions and with cognitive therapy, some symptoms may persist. There is some evidence that mind-body interventions which include stretching and breathing may reduce stress and impact positively on quality of life and health outcomes in individuals with PTSD.<br><br>This study primarily investigated the underlying neuro-endocrinological mechanisms behind improvements in the severity of symptoms of PTSD, through measuring changes in cortisol levels associated with a mindfulness stretching and breathing programme. A self-reported PTSD checklist was also used and is the focus of this data extraction.<br><br>(Pages 2984-2985) |
| **Materials used** | None reported |
| **Procedures used** | Mindfulness based stress reduction (MBSR) is time and resource intensive and was not practical for this target audience. This intervention therefore consisted of stretching and balancing movements combined with breathing and a focus on mindfulness. |

| | |
|---|---|
| | In the sessions, participants were instructed to pay attention to the flow of each movement in the present moment and to focus on consciously regulating the inhalation, retention, and exhalation of their breath.<br><br>Over the duration of the course, the intensity of the exercises increased.<br><br>(Page 2986) |
| **Provider** | A trained instructor<br><br>(Page 2986) |
| **Method of delivery** | Group<br><br>(Page 2986) |
| **Setting/location of intervention** | The sessions were delivered at the University conducting the trial<br><br>(Page 2986) |
| **Intensity/duration of the intervention** | 16 sessions of 60 minutes duration, held 'semi-weekly' over 8 weeks<br><br>(Page 2986) |
| **Tailoring/adaptation** | None reported |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**Mindfulness-based stretching and deep breathing exercises**

No intervention (N = 11)

| | |
|---|---|
| **Brief name** | No intervention |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

| | |
|---|---|
| **Other details** | None to add |

## D.23 Kurebayashi, 2014

| | |
|---|---|
| **Bibliographic Reference** | Kurebayashi, Leonice Fumiko Sato; Silva, Maria Julia Paes da; Efficacy of Chinese auriculotherapy for stress in nursing staff: a randomized clinical trial.; Revista latino-americana de enfermagem; 2014; vol. 22 (no. 3); 371-8 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | 1042/2011; NCT01420835 |
| **Study start date** | Jan-2012 |
| **Study end date** | Jul-2012 |
| **Aim** | To evaluate the efficacy of auriculotherapy, with and without a protocol, in reducing the stress levels of nursing professionals |
| **Country/geographical location** | Brazil |
| **Setting** | Workplace<br>• Private sector<br>• Healthcare<br>• Large organisation]<br>• Contract type - Not specified<br>• Seniority - Not specified |

| | |
|---|---|
| **Inclusion criteria** | • Availability of time to attend the sessions, and<br>• score on the SSL indicating a medium or high level of stress. |
| **Exclusion criteria** | • Nephrolithiasis with surgical indication (the Kidney point can stimulate the expulsion of stones),<br>• performing another energy therapy,<br>• taking anxiolytic or anti-depressant medication,<br>• pregnancy |
| **Method of randomisation** | Using numbers randomly generated electronically via a website (www.randomizer.org) |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation was performed based on a test power of 80% for a significance level of 5%, or confidence level of 95%.<br>• No information on how missing data was dealt with |
| **Attrition** | 17.8% (38/213) did not compete the study but no data on dropouts per group |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• 6 weeks (endpoint)<br>• 30 days after endpoint (follow-up<br><br>Primary outcome |

| | |
|---|---|
| | • Vasconcelos' Stress Symptoms List<br><br>Secondary outcome<br><br>• Comorbidities |
| **Study limitations (author)** | No limitations outlined |
| **Study limitations (reviewer)** | Lack of information regarding blinding, allocation protocol, drop-outs<br><br>Authors highlight that treatment duration might not be long enough to have desired effect given the potential complexity of stress; One-arm (no protocol) were outlined as having greater co-morbidities than the others which may influence results. |
| **Source of funding** | Not specified |

**Study arms**

Auriculotherapy with protocol (N = 58)

Auriculotherapy (Chinese holistic therapy) and protocol

Auriculotherapy without protocol (N = 59)

Assessment only (N = 58)

No treatment - questionnaire only.

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 175)** |
|---|---|
| **Age** | 33.98 (7.85) |

| Characteristic | Study (N = 175) |
|---|---|
| Mean (SD) | |

**Outcomes**

**Study timepoints**

Baseline

**30 day (Data was collected 30 days after the end of the intervention)**

**Stress levels (Vasconcelos' Stress Symptoms List)**

| Outcome | Auriculotherapy with protocol, Baseline, N = 58 | Auriculotherapy with protocol, 30 day, N = 58 | Auriculotherapy without protocol, Baseline, N = 59 | Auriculotherapy without protocol, 30 day, N = 59 | Assessment only, Baseline, N = 58 | Assessment only, 30 day, N = 58 |
|---|---|---|---|---|---|---|
| **Job stress** Reported using Vasconcelos' Stress Symptoms List<br><br>Mean (SD) | 62.26 (21.5) | 48.5 (22.9) | 65 (22.62) | 47.22 (23.87) | 57.76 (17.64) | 63.21 (26.85) |

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Auriculotherapy with protocol vs Auriculotherapy without protocol vs Assessment only (30 day follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**Auriculotherapy with protocol (N = 58)**

| | |
|---|---|
| **Brief name** | Auriculotherapy with protocol |
| **Rationale/theory/Goal** | Evaluate the efficacy of auriculotherapy, with and without a protocol, in reducing the stress levels of nursing professionals |
| **Materials used** | Semi-permanent needles,  local anaesthetic, cotton,  70% ethyl alcohol, hypoallergenic tape. |
| **Procedures used** | For placement of the semi-permanent needles, after the localization of the reactive points, cleaning of the pinna was performed, using cotton and 70% ethyl alcohol, and the needles applied and affixed with hypoallergenic tape.In the Protocol group the Shen Men, Brainstem, Kidney, Liver, Liver Yang 1 and 2 points were used. |

| | |
|---|---|
| **Provider** | Private hospital and University of Sao Paulo. The sessions were conducted by a group consisting of six acupuncturists nurses and a acupuncturist psychologist, trained in the same school, experienced in the use of the same technique of Chinese auriculotherapy. |
| **Method of delivery** | Sessions conducted by a group of accupuncturists. |
| **Setting/location of intervention** | Hospital |
| **Intensity/duration of the intervention** | 12 session over 2 weeks - 2 sessions a week each lasting 5-10 minutes. |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | 213 people were allocated into three groups - The sample calculation was performed using as a base the previous study of stress, and it was affirmed that the sample had a test power of 80% for a significance level of 5%, or confidence level of 95%. |
| **Actual treatment fidelity** | 175/213 - 82% |
| **Other details** | None to add |

**Auriculotherapy without protocol (N = 59)**

| | |
|---|---|
| **Brief name** | Auriculotherapy with no protocol |
| **Rationale/theory/Goal** | Evaluate the efficacy of auriculotherapy, with and without a protocol, in reducing the stress levels of nursing professionals |
| **Materials used** | Semi-permanent needles,  local anaesthetic, cotton,  70% ethyl alcohol, hypoallergenic tape. |

| | |
|---|---|
| **Procedures used** | For placement of the semi-permanent needles, after the localization of the reactive points, cleaning of the pinna was performed, using cotton and 70% ethyl alcohol, and the needles applied and affixed with hypoallergenic tape. In the no protocol group, the acupuncture points were chosen depending on the symptoms reported by participants at each session, according to traditional Chinese medicine. |
| **Provider** | Private hospital and University of Sao Paulo. The sessions were conducted by a group consisting of six acupuncturists nurses and a acupuncturist psychologist, trained in the same school, experienced in the use of the same technique of Chinese auriculotherapy. |
| **Method of delivery** | Sessions conducted by a group of accupuncturists. |
| **Setting/location of intervention** | Hospital |
| **Intensity/duration of the intervention** | 12 session over 2 weeks - 2 sessions a week each lasting 5-10 minutes. |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | 213 people were allocated into three groups - The sample calculation was performed using as a base the previous study of stress, and it was affirmed that the sample had a test power of 80% for a significance level of 5%, or confidence level of 95%. |
| **Actual treatment fidelity** | 175/213 - 82% |
| **Other details** | None to add |

**Assessment only (N = 58)**

| | |
|---|---|
| **Brief name** | Assessment only |

| | |
|---|---|
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | The control received no intervention but completed the assessment questionnaires at baseline, after the intervention grouips completed the intervention and at 30 days follow up. |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

## D.24 Lacerda, 2018

| | |
|---|---|
| **Bibliographic Reference** | Lacerda, Shirley S; Little, Stephen W; Kozasa, Elisa H; A Stress Reduction Program Adapted for the Work Environment: A Randomized Controlled Trial With a Follow-Up.; Frontiers in psychology; 2018; vol. 9; 668 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT02660307 |
| **Aim** | The aim of this study was to evaluate the effectiveness of an in-situ mindfulness intervention developed specifically for business workers on stress, anxiety, depression, non-severe psychiatric symptoms and attention. |
| **Country/geographical location** | Brazil |
| **Setting** | Workplace<br>• Private sector<br>• Business industry<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • aged from 18-60<br>• had stress complaints<br>• were available to attend the programme<br>• had at least 8 years of education (to ensure they were able to read and understand the self administered questionnaires |
| **Exclusion criteria** | Employees who |

| | |
|---|---|
| | • had a history of psychiatric or neurological disorders<br>• were undergoing psychiatric treatment at the time of the study<br>• had a history of substance abuse (except tobacco) |
| **Method of randomisation** | Randomised number table |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • The sample size was calculated according to a confidence interval of 0.95, a sampling error of 0.05, and a power effect of 0.8. A sample size calculation was conducted and a minimum of 15 participants in each group was determined.<br>• Between group differences were determined by chi-square and Student's T-test<br>• Comparisons between and within groups were analysed by a MANOVA test for repeated measures.<br>• A confirmatory factor analysis (CFA) was used to investigate the construct validity of Progress.3 models were developed to represent the best fit for the overall data. The first was a one factor model used as a baseline comparison against the other models.; The second was a two-factor model with mental health and stress as latent factors and the third included three latent factors: mental health, stress and attention.<br>• The analysis was carried out using the program IBM SPSS Statistics 22.0 (IBM) and IBM SPSS Amos Version 24.0 (IBM). |
| **Attrition** | • 22 of the 39 (56.4%) participants allocated to the intervention were included in analyses. 13 (33.3%) did not receive the intervention and 4 (10.2%) were lost to follow up.<br>• 22 of the 38 (57.9%) participants allocated to the waiting list were included in analyses. 14 (36.8%) did not receive the intervention and 2 (5.3%) were lost to follow up.<br><br>Percentages calculated by reviewer |

| | |
|---|---|
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• T1 = baseline<br>• T2 = 8 weeks (crossover)<br>• T3 = 16 weeks (endpoint)<br><br>Primary outcome not specified<br><br>Outcomes were<br><br>• Psychiatric symptoms (Self-Report Questionnaire-20)<br>• Stress (Lipp Stress Symptoms Inventory)<br>• Depression (Beck Depression Inventory)<br>• Anxiety (Beck Anxiety Inventory)<br>• Visual and motor response (Digit-Symbol)<br>• Mindfulness (Mindful Awareness Compassion Scale) |
| **Study limitations (author)** | • One of the authors developed the programme<br>• The study was tested only in companies in Brazil and this may limit its generalisability<br>• Possible Hawthorne effects<br>• There was no placebo group<br>• The study did not compare the effects on different groups of workers e.g. according to type of job role<br>• Biological measures could be included in future studies e,g. cortisol levels<br>• From an employers perspective it would be helpful to measure absenteeism and presenteeism indicators, and productivity |
| **Study limitations (reviewer)** | Missing data for 6 completers (4 in intervention group and 2 in control group) at T2 (crossover) |
| **Source of funding** | Serviço Social da Indústria |

**Study arms**

Mindfulness-based stress reduction (N = 39)

PROGRESS - an insitu mindfulness intervention for the workplace

Waiting list (N = 38)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Mindfulness-based stress reduction (N = 39) | Waiting list (N = 38) |
|---|---|---|
| **Age**<br>reported for completers only<br><br>Mean (SE) | 35.68 (2.14) | 37.55 (2.06) |
| **Male age**<br><br>Mean (SE) | 35.11 (3.99) | 33.55 (2.51) |
| **Female age**<br><br>Mean (SE) | 36.08 (2.49) | 41.55 (2.89) |
| **Male**<br><br>Sample size | n = 9 ; % = 40.9 | n = 11 ; % = 50 |
| **Female**<br><br>Sample size | n = 13 ; % = 59.1 | n = 11 ; % = 50 |

**Outcomes**

**Study timepoints**

Baseline

0 week (8 weeks (Postvention))

**Employee outcomes**

| Outcome | Mindfulness-based stress reduction, Baseline, N = 39 | Mindfulness-based stress reduction, 0 week, N = 39 | Waiting list , Baseline, N = 38 | Waiting list , 0 week, N = 38 |
|---|---|---|---|---|
| **Mental wellbeing**<br>Mindfulness Attention Awareness Scale - 1-6 scale classifying frequency of being aware or mindful<br><br>Sample size | n = 22 ; % = 56.4 | n = 22 ; % = 56.4 | n = 22 ; % = 57.9 | n = 22 ; % = 57.9 |
| **Mental wellbeing**<br>Mindfulness Attention Awareness Scale - 1-6 scale classifying frequency of being aware or mindful<br><br>Mean (SE) | 58.72 (3.21) | 65.08 (3.23) | 57.58 (2.88) | 57.25 (2.9) |
| **In last month**<br><br>Sample size | n = 22 ; % = 56.4 | n = 22 ; % = 56.4 | n = 22 ; % = 57.9 | n = 22 ; % = 57.9 |
| **In last month**<br><br>Mean (SE) | 5.4 (0.76) | 2.24 (0.61) | 5 (0.68) | 4.16 (0.55) |
| **Mental health symptoms**<br>Beck Depression Inventory - 21 item scale | n = 22 ; % = 56.4 | n = 22 ; % = 56.4 | n = 22 ; % = 57.9 | n = 22 ; % = 57.9 |

| Outcome | Mindfulness-based stress reduction, Baseline, N = 39 | Mindfulness-based stress reduction, 0 week, N = 39 | Waiting list , Baseline, N = 38 | Waiting list , 0 week, N = 38 |
|---|---|---|---|---|
| Sample size | | | | |
| **Mental health symptoms**<br>Beck Depression Inventory - 21 item scale<br><br>Mean (SE) | 12.28 (1.6) | 6.24 (1.2) | 12.16 (1.43) | 10.38 (1.07) |

Mental wellbeing - Polarity - Higher values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing - Mindfulness-based stress reduction vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(High dropout rates in both arms)* |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns<br>*(No outcome data provided for some completers)* |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcome, missing outcome data for some completers and high dropout rates)* |

**Mental health symptoms - Mindfulness-based stress reduction vs Waiting list (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(High dropout rates in both arms)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Some concerns<br>*(No outcome data provided for some completers)* |
| Overall bias | Risk of bias judgement | High<br>*(Self-reported outcome, missing outcome data for some completers and high dropout rates)* |

**Study arms**

**In-situ mindfulness intervention (N = 39)**

| | |
|---|---|
| **Brief name** | PROGRESS - in-situ mindfulness intervention for the workplace<br><br>(Page 4) |
| **Rationale/theory/Goal** | Depression and anxiety are co-morbidities commonly associated with stress. Stress may not be related only to work but to family life and may impact on health and wellbeing, employee attitude and work performance.<br><br>Mindfulness based stress reduction programmes include meditation, body awareness techniques and gentle movements to increase self knowledge and resilience.<br><br>The aim of this study was to evaluate the effectiveness of an insitu mindfulness intervention developed specifically for business workers on stress, anxiety, depression, non-severe psychiatric symptoms and attention.<br><br>It was focused on:<br><br>• psychological wellbeing - reducing stress and increasing attention skills<br>• developing emotional skills (e.g. interpersonal skills, empathy)<br>• It was designed to fit into work time constraints, while being of sufficient length to deliver the content and allow participants time to integrate the skills into daily life<br><br>(Page 2-3) |

| | |
|---|---|
| **Materials used** | • Printed handouts and CD's with material relevant to each class were handed out at the end of each session.<br>• Weekly diary for participants to complete<br>• A room provided at the participants' company specifically for them to practice in.<br><br>(Page 6) |
| **Procedures used** | The first 4 sessions focused on developing self awareness around the physical and psychological signs of stress. The following 2 sessions focused on putting the training into practice and the final 2 weeks on developing more constructive and empathetic relationships with others.<br><br>Session content was as follows:<br><br>• Session 1- Mind body interactions and 'being present'<br>• Session 2 - 5 ways of integrating presence into life<br>• Session 3 - Perceiving body signals<br>• Session 4 - Identifying one's most common reactions<br>• Session 5 - Dealing with stress and a half way evaluation and assessment<br>• Session 6 - Practice class<br>• Session 7 - Empathy<br>• Session 8 - Navigating stress with wisdom and evaluation of training<br><br>Sessions included 'report ins' of how things had gone during the week.<br><br>Participants were instructed to practice at work, up to 5 times each week for 30 mins.<br><br>(Page 6) |
| **Provider** | Not specified |
| **Method of delivery** | Classes - number of participants is not specified<br><br>(Page 6) |

| | |
|---|---|
| **Setting/location of intervention** | Classes were delivered in the workplace. In one company this was early in the morning before work commenced, In the other company they were held just before lunch.<br><br>(Page 10)<br><br>A room was also set aside for participants to practice in, in the workplace.<br><br>(Page 6) |
| **Intensity/duration of the intervention** | 8 classes were delivered weekly for 2 months. The initial and final classes lasted for 90 mins and the other 6 classes lasted 60 minutes.<br><br>(Page 6) |
| **Tailoring/adaptation** | None reprted |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**PROGRESS - in situ mindfulness intervention for the workplace**

**Waiting list (N = 38)**

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | Not reported |

| | |
|---|---|
| **Materials used** | Not applicable |
| **Procedures used** | After the first 8 weeks, participants allocated to the waiting list received the intervention.<br><br>(Page 5) |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | 8 weeks waiting list after which the control group received the intervention for 8 weeks<br><br>(Page 5) |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

Waiting list

## D.25 Lexis, 2011

| | |
|---|---|
| **Bibliographic Reference** | Lexis, M.A.S.; Jansen, N.W.H.; Huibers, M.J.H.; Van Amelsvoort, L.G.P.M.; Berkouwer, A.; Ton, G.T.A.; Van Den Brandt, P.A.; Kant, I.; Prevention of long-term sickness absence and major depression in high-risk employees: A randomised controlled trial; Occupational and Environmental Medicine; 2011; vol. 68 (no. 6); 400-407 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To determine the effectiveness of an approach which combines Cognitive Behavioural Therapy (CBT) and Problem Solving Therapy (PST) and focuses on work related issues, in preventing future long-term sickness absence and major depression among employees who were identified as being at high risk of long-term sickness absence and who have mild to severe depressive complaints. |
| **Country/geographical location** | The Netherlands |
| **Setting** | Workplace<br>• Private sector<br>• Finance industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Mixed |
| **Inclusion criteria** | • were at risk of sickness absence and with mild to severe depressive complaints<br>• provided written consent |
| **Exclusion criteria** | • fully or partially absent from work<br>• receiving treatment from a psychologist or psychiatrist at the time of screening |

| | |
|---|---|
| | • pregnant or on maternity leave. |
| **Method of randomisation** | Computerised random number generators (block size 2) based on employee personnel numbers. |
| **Method of allocation concealment** | • Randomisation performed by principle investigator |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation - a two-sided 5% significance level and a power of 80% indicated there should be a minimum of 59 participants in each group. Accounting for a possible attrition rate of 15%, gave a sample size of 136.<br>• Data were analysed according to ITT<br>• For sickness absence duration and sickness absence frequency outcomes, poisson regression analysis was used.<br>• For continuous outcomes, linear regression analysis was used, adjusting for baseline differences.<br>• Clinically meaningful changes on the Beck Depression Inventory II (BDI-II) were determined by calculating the Reliable Change Index as developed by Jacobson and Truax. (a decrease of at least 7 points and a post-treatment score below 14).<br>• Chi-square tests were used to test frequency differences in reliable and clinically significant change.<br>• All analyses were carried out using SPSS version 15.0, Stata statistical software package 8.0 and SAS. |
| **Attrition** | • As sickness absence was measured objectively by linking to company records, follow up for this outcome at 12 and 18 months was 100% of those initially randomised for both the intervention and control group.<br>• The baseline questionnaire, which focused on the depressive complaints outcomes was repeated at 6 and 12 months follow up.<br>• In the intervention group, 45 (65.2%) of those initially randomised returned questionnaires at 6 months and 43 (62.3%) at 12 months.<br>• In the control group, 54 (77%) of those initially randomised returned questionnaires at 6 months and 47 (67.1%) at 12 months. |

| | |
|---|---|
| | • In the intervention group, 46 (66.6%) of those randomised to the intervention commenced. 17 (24.6%) of those initially randomised to the intervention, dropped out after consultation with the company counsellor and before commencing the intervention.<br><br>Percentages calculated by reviewer |
| **Assessments and timepoints** | The following assessments were carried out at these times<br><br>• 6 months (follow-up)<br>• 12 months (follow-up)<br>• 18 months (follow-up) (sickness absence only)<br><br>Primary outcomes<br><br>• Sickness absences<br>• Depression (BDI-II)<br><br>Secondary outcomes<br><br>• Self-rated health (SF-36)<br>• Psychological distress (Brief Symptom Inventory)<br>• Depression (Hospital Anxiety and Depression Scale)<br>• Job demands, decision latitude and social support (job Content Questionnaire)<br>• Job insecurity and commitment (Questionnaire on the Experience and Evaluation of Work) |
| **Study limitations (author)** | • During a pilot study, there was less overlap than expected between the issues of risk for long-term sickness absence and depressive complaints. To ensure enough participants, the screening questionnaire was therefore sent to more employees than originally intended. In addition, the cut off point on the screening tool was amended to improve sensitivity to the overlap between the two issues.<br>• For screening, the Hospital Anxiety Depression Scale (HAD-D) was used to identify employees with mild to severe depressive complaints. However at baseline and as an outcome, the Beck Depression Inventory II (BDI-II) was used. Many of the employees identified with mild to severe depressive complaints by HAD-D fell into the 'no to minimal' depressive complaints range of the BDI-II at baseline. |

| | |
|---|---|
| | • A large number of employees dropped out after consultation with the company counsellor. The study focus was on relatively mild depressive complaints and increased risk for a future event. Many reported not to have health complaints at screening and may therefore have refused to participate<br>• Only 38 of the 69 participants randomised to the intervention group received the intervention according to protocol (44.9% incomplete interventions). Drop-outs could have affected the results.<br>• The number of sessions was not fixed (as there was the option to add up to 5 specific sessions to the 7 basic sessions). In addition, some employees did not complete the basic 7 sessions, but the per protocol analysis showed improvement. Consequently, it is not possible to determine how many session are needed to treat mild complaints, as these range in severity and individual tailoring of the intervention may be required.<br>• The study was conducted among office workers and may not be generalisable.to the working population as a whole. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | • The Netherlands Organisation for Health Research and Development (Zon Mw), grant no 62200024,<br>• CAPHRI School for Public Health and Primary Care, Maastricht, The Netherlands<br>• Occupational Health Services 'Beter' (ABN AMRO Arbo Services), Amsterdam, The Netherlands. |

**Study arms**

CBT + PST (N = 69)

Early prevention intervention based on combined cognitive behavioural therapy and problem solving therapy

Usual care (N = 70)

Care as usual from occupational health services

**Characteristics**

**Arm-level characteristics**

| Characteristic | CBT + PST (N = 69) | Usual care (N = 70) |
|---|---|---|
| **Age**<br>Mean (SD) | 48.41 (8.68) | 47.07 (9.49) |
| **Male**<br>Sample size | n = 42 ; % = 60.9 | n = 43 ; % = 61.4 |
| **Female**<br>Calculated by reviewer<br>Sample size | n = 27 ; % = 39.1 | n = 27 ; % = 38.6 |
| **Low**<br>Sample size | n = 5 ; % = 7.9 | n = 6 ; % = 9 |
| **Medium**<br>Sample size | n = 49 ; % = 77.8 | n = 45 ; % = 67.2 |
| **High**<br>Sample size | n = 9 ; % = 14.3 | n = 16 ; % = 23.9 |
| **Working hours**<br>per week<br>Mean (SD) | 34.8 (4.52) | 34.9 (4.91) |

**Outcomes**

**Study timepoints**

Baseline

12 month (12 month follow-up (Questionnaire only))

18 month (18 months follow up (Sickness absence only))

**Employee outcomes**

| Outcome | Baseline, CBT + PST, N = 69 | Baseline, Usual care , N = 70 | 12 month, CBT + PST, N = 69 | 12 month, Usual care , N = 70 | 18 month, CBT + PST, N = 69 | 18 month, Usual care , N = 70 |
|---|---|---|---|---|---|---|
| **Mental health symptoms**<br>Beck Depression Inventory II<br><br>Mean (SD) | 17.03 (9.55) | 14.84 (8.11) | 12.42 (9.64) | 16.69 (11.04) | NA (NA) | NA (NA) |
| **Job stress**<br>Report as psychological distress using Brief Symptom Inventory (BSI)<br><br>Mean (SD) | 40.79 (27.85) | 35.34 (25.47) | 32.19 (33.29) | 42.19 (33.78) | NA (NA) | NA (NA) |
| **Absenteeism**<br>Calendar days taken as sickness absence from company records from baseline to 18 months follow up<br><br>Mean (SD) | NA (NA) | NA (NA) | NA (NA) | NA (NA) | 45.03 (76.59) | 62.57 (81.89) |
| **Sickness absence**<br>Participants with absence periods > 28 calendar days baseline to 18 months follow-up<br><br>Sample size | n = NA ; % = NA | n = NA ; % = NA | n = NA ; % = NA | n = NA ; % = NA | n = 14 ; % = 20.3 | n = 22 ; % = 31.4 |

Mental health symptoms - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Absenteeism - Polarity - Lower values are better

Sickness absence - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental health symptoms - Early prevention vs Usual care (12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Job stress - Early prevention vs Usual care (12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Absenteeism - Early prevention vs Usual care (18 months follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study arms**

CBT + PST (N = 69)

| | |
|---|---|
| **Brief name** | Early prevention intervention based on combined cognitive behavioural therapy and problem solving therapy<br><br>(Page 400) |
| **Rationale/theory/Goal** | The intervention aims to use lifestyle and adaptive coping skills to reduce the subjective experience and espects of stress.<br><br>(Page 401) |
| **Materials used** | • Treatment protocol<br>• Workbooks for practical assignments<br><br>(Page 401) |
| **Procedures used** | The intervention consisted of 2 parts:<br><br>• Basic - 7 sessions on the basic steps of Problem Solving Therapy (PST)<br>• Specific - up to 5 further sessions in which the participant could choose to focus on a particular aspect e.g. cognitive restructuring.<br>• The need for the specific sessions and area of focus was agreed jointly between the psychologist and participant in the 7th basic session, with the option to end the sessions at that point if the participant had recovered.<br>• The principles of CBT were applied in all sessions<br>• Homework was set at the end of each session and was discussed in the next session. |

| | |
|---|---|
| | (Page 401) |
| **Provider** | • 10 registered psychologists from a national company (Cenzo BV) which provided regular healthcare to the company.<br>• 2 days of training were provided to the psychologists before the study and a 1-day booster session during the study.<br><br>(Page 401) |
| **Method of delivery** | Not specified |
| **Setting/location of intervention** | Not specified |
| **Intensity/duration of the intervention** | 7 x 45 minute basic sessions, plus up to 5 further specific sessions if required. The time period over which they were delivered is not reported.<br><br>(Page 401) |
| **Tailoring/adaptation** | The 'specific' phase of the intervention was tailored to meet the specific needs of the participants.<br><br>(Page 401) |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Adherence was defined as participants' being exposed to all the essential predefined steps of the intervention'.<br><br>(Page 403) |
| **Actual treatment fidelity** | Not reported |

**Early prevention intervention based on combined cognitive behavioural therapy and problem solving therapy**

Usual care (N = 70)

| | |
|---|---|
| **Brief name** | Care as usual from occupational health services<br><br>(Page 401) |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not applicable |
| **Procedures used** | Care as usual from occupational health services, which if requested included consultation with an occupational physician and, if necessary, referral to other disciplines.<br><br>In case of sickness absence, this included social medical counselling.<br><br>(Page 401) |
| **Provider** | Occupational health services<br><br>(Page 401) |
| **Method of delivery** | Not specified |
| **Setting/location of intervention** | Not specified |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |

| | |
|---|---|
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

Care as usual from occupational health services

## D.26 Lindquist, 1999

| | |
|---|---|
| **Bibliographic Reference** | Lindquist, Thalina L.; Cooper, Cary L.; Using lifestyle and coping to reduce job stress and improve health in 'at risk' office workers; Stress Medicine; 1999; vol. 15 (no. 3); 143-152 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not specified |
| **Aim** | To evaluate the effectiveness of targeting individual lifestyle and adaptive coping strategies to reduce perceived work stress and improve health in terms of blood pressure and physical health in male and female office workers who were identified as having high levels of perceived stress, unhealthy lifestyle behaviours and poor coping skills. |
| **Country/geographical location** | Australia |
| **Setting** | Workplace<br>• Public sector<br>• Government<br>• Large organisation<br>• Contract type - Not specified |

| | |
|---|---|
| | • Seniority - Not specified |
| **Inclusion criteria** | • Identified as having high levels of perceived stress, unhealthy lifestyle behaviours and poor coping skills. |
| **Exclusion criteria** | Not specified |
| **Method of randomisation** | Not reported |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • No information on power calculation<br>• No information on how missing data were dealt with<br>• Demographics - not specified but assume a comparison of means<br>• Analyses of covariance (ANCOVA) were used to address overall programme effectiveness with pre-intervention scores as covariates<br>• Stepwise multiple regression analyses were used to statistically untangle the impact of predictor variables on the pre-intervention adjusted dependent variables of interest.<br>• Change in mean scores and standard deviations was undertaken for the findings of a stress questionnaire and T-tests were carried out to see if stress levels from pre-programme entry to the 12-week follow-up were significantly different |
| **Attrition** | 0% attrition - 730 employee sample; 204 participants returned the pre-intervention survey of which 104 employees were selected to participate all of which appear to have provided pre and post data. The authors highlight that whilst participant retention in the study at post-intervention was high at 100% (n=104) after the follow-up period study participants dropped to 66% (n=66) but this is related to the completion of a post follow-up stress questionnaire only |

| | |
|---|---|
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• 8 weeks (endpoint)<br>• 20 weeks (follow-up) - 12 weeks after endpoint<br><br>Primary outcome not specified<br><br>Outcomes include<br><br>• Occupational Stress Indicator<br>• Lifestyle measure related to alcohol consumption, smoking habits and physical activity.<br>• Blood pressure<br>• Weight<br>• BMI |
| **Study limitations (author)** | Authors outline that it is not possible to say which aspects of the programme were more important to initiate and maintain the desired changes as the intervention was multifaceted. |
| **Study limitations (reviewer)** | Study lacks detail regarding its process for blinding and allocation concealment which is a potential source of selection and performance bias; Study participants appear to work in the same organisation which could possibly confound the intervention due to interactions between study arm participants. |
| **Source of funding** | Not specified |

**Study arms**

Stress-management and coping skills training (N = 52)

Waiting list (N = 52)

**Characteristics**

**Study-level characteristics**

| Characteristic | Study (N = 104) |
|---|---|
| **Age**<br><br>Range | 24 to 54 |
| **Male**<br><br>Sample size | n = 47 ; % = 45 |
| **Female**<br><br>Sample size | n = 57 ; % = 55 |

**Outcomes**

**Study timepoints**

Baseline

0 week (Endpoint (8 weeks after baseline))

**Employee outcomes**

| Outcome | Stress-management and coping skills training, Baseline, N = 52 | Stress-management and coping skills training, 0 week, N = 52 | Waiting list, Baseline, N = 52 | Waiting list, 0 week, N = 52 |
|---|---|---|---|---|
| **Job stress**<br>Sources of stress scale from the Occupational Stress Indicator<br><br>Mean (SD) | 33.1 (6.01) | 30.71 (6.33) | 32.81 (6.49) | 32.36 (5.42) |

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Intervention vs Control (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Study arms**

Stress-management and coping skills training (N = 52)

| | |
|---|---|
| **Brief name** | Stress-management and coping skills training [P 113] |
| **Rationale/theory/Goal** | To promote the use of lifestyle and adaptive coping skills to reduce the subjective experience and aspects of stress. [P 114] |

| | |
|---|---|
| **Materials used** | Workshops, individualised feedbackobtained from the initial assessments; study coordinator phoned participants weekly to encourage action plan maintenance. Participants in both the intervention and control groups were contacted and asked to complete their questionnaire and blood pressure assessments a second time.<br><br>On completion of the second assessment, individual 45-minute counselling sessions were scheduled for both groups. A personalized action plan was developed for each individual based on the lifestyle and coping information obtained from their second assessment. A 12-week after work hours follow-up phase was provided to support intervention maintenance each participant was contacted by internal electronic mail on a fortnightly basis to encourage action plan maintenance. At the end of the 12-week follow-up period, all participants (104) were sent a work-related stress questionnaire, programme and self-evaluation sheets to be returned 3 days later.<br><br>Questionnaires used:<br><br>Sources-of-stress scale, physical health scale, coping scale of the Occupational Stress Indicator (OSI) was used<br><br>A questionnaire developed by the University Department of Medicine (Western Australia) was used to measure lifestyle (alcohol consumption, smoking habits and physical activity)<br><br>Seated blood pressure was measured seven times at 2-minute interval via a Dinamap 1846SX/P oscillometric recorder. Body weight and a body mass index (BMI) were measured (pre/post) |
| **Procedures used** | Group workshops were followed by individual counselling sessions |
| **Provider** | Not reported |
| **Method of delivery** | Face to face [P 144] |
| **Setting/location of intervention** | Workplace |

| | |
|---|---|
| **Intensity/duration of the intervention** | Weekly workshops following by individual counselling sessions, |
| **Tailoring/adaptation** | Not reported, individual action plan maintenance. |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Waiting list (N = 52)**

| | |
|---|---|
| **Brief name** | Waiting list [ P 144] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | of the Occupational Stress Indicator (OSI) was used<br><br>A questionnaire developed by the University Department of Medicine (Western Australia) was used to measure lifestyle (alcohol consumption, smoking habits and physical activity)<br><br>Seated blood pressure was measured seven times at 2-minute interval via a Dinamap 1846SX/P oscillometric recorder. Body weight and a body mass index (BMI) were measured (pre/post) |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |

| | |
|---|---|
| **Method of delivery** | Not applicable be returned 3 days later. |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.27 Loft, 2013

| | |
|---|---|
| **Bibliographic Reference** | Loft, Marisa H; Cameron, Linda D; Using mental imagery to deliver self-regulation techniques to improve sleep behaviors.; Annals of behavioral medicine : a publication of the Society of Behavioral Medicine; 2013; vol. 46 (no. 3); 260-72 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | NCT01648062 |
| **Aim** | To determine the efficacy of mental imagery techniques, that promote reduction and implementation intentions, to improve sleep behavior. |

| | |
|---|---|
| **Country/geographical location** | New Zealand |
| **Setting** | Workplace:<br><br>• Sector: private<br>• Industry: not reported<br>• Organisation size: mixed (10 large and one small)<br>• Contract type: full-time<br>• Seniority: mixed<br>• Income: mixed |
| **Inclusion criteria** | Eligibility criteria included:<br><br>• ability to read and write in English<br>• full-time employment<br>• work shifts during daytime hours<br>• a job role that provided daily access to email<br>• a score of four or greater on the Pittsburgh Sleep Quality Inventory (PSQI), which indicates at least moderate difficulties in two or more areas (e.g., sleep quality and daytime dysfunction)<br>• no identified, biological cause of sleep problems (e.g., restless leg syndrome, sleep apnoea, narcolepsy, periodic limb movement disorder, or pregnancy)<br>• no current diagnosis of insomnia<br>• no depression<br>• no child under the age of 5<br>• no commitment outside of work that caused them to regularly lack sleep |
| **Exclusion criteria** | Participants were excluded if they worked night shifts through the organisation or a secondary job |
| **Method of randomisation** | Eligible participants were randomized into the four imagery task conditions using the website tool, www.randomiser.com. Participants were blinded to their condition assignment and were only informed about the condition allocations after the study ended. They were instructed |

| | |
|---|---|
| | to not discuss the imagery tasks with colleagues. |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Preliminary analyses confirmed that data met statistical assumptions. We used one-way ANOVAs and χ2 analyses to determine a priori, intervention group differences in demographic, personal, and sleep variables.<br>• Participants with more than 70 % of their daily data missing (n=7) were excluded from the mixed-model analyses. Intention-to-treat analyses were conducted on the analyses of changes in sleep-related measures from baseline to the Day 21 follow-up to examine the effects of attrition on the patterns of findings, using the last observation carried forward technique for the five participants lost to follow-up.<br>• Power analyses using “G-Power3” indicated that a sample size of 104 was sufficient to detect moderate group effects on changes from baseline to follow-up in pre-sleep arousal and sleep habits; partial n2 (η2p) = 0.28. |
| **Attrition** | Intervention groups - overall 74 out of 76 participants (97%) completed 3-week follow-up<br><br>• Arousal reduction: 26 out of 27 participants completed 3-week follow-up<br>• Implementation intentions group: 26 out of 26 participants completed 3-week follow-up<br>• Combined group: 22 out of 23 participants completed 3-week follow-up<br><br>Control - 25 out of 28 participants (89%) completed 3-week follow-up |
| **Assessments and timepoints** | The following outcomes were measured:<br><br>• demographic and personal characteristics<br>• the PSQI, pre-sleep arousal, frequency of negative sleep habits, and sleep planning<br><br>At the following timepoints:<br><br>• Baseline |

| | |
|---|---|
| | • Day 21 |
| **Study limitations (author)** | • The relatively small sample of New Zealanders, two thirds of whom were women, limits the potential generalizability of the findings to men and groups in other cultural settings.<br>• The multiple analyses increased the risk of Type 1 error; however, the consistent patterns of findings across the analyses increase confidence in the observed intervention effects.<br>• The sample consisted of individuals with behaviourally induced insufficient sleep, which can be considered a pre-cursor to insomnia (although insomnia also involves difficulty initiating or maintaining sleep despite ample opportunity). Although diagnosed insomnia was a criterion for exclusion, it is possible that some participants had undiagnosed insomnia, particularly since insomnia is largely undiagnosed in the general population. Participants with insomnia may have been less responsive to the intervention manipulations than individuals who were sleep deprived through lifestyle choices. |
| **Study limitations (reviewer)** | • Outcome measures were self-reported, however, participants were blinded<br>• Long-term effects were not measured |
| **Source of funding** | Not reported |

**Study arms**

Imagery tasks (N = 76)

Pooled analyses from participants that were randomised to arousal reduction, implement intentions and combined intervention groups.

Neutral imagery - control (N = 28)

28 participants were randomised to the neutral imagery control condition.

**Characteristics**

**Study-level characteristics**

| Characteristic | Study (N = 104) |
|---|---|
| **Age**<br>Mean (SD) | 37 (10.56) |

**Arm-level characteristics**

| Characteristic | Imagery tasks (N = 76) | Neutral imagery - control (N = 28) |
|---|---|---|
| **Men**<br>No of events | n = 28 ; % = 37 | n = 9 ; % = 36 |
| **Women**<br>No of events | n = 47 ; % = 62 | n = 16 ; % = 64 |
| **NZ European**<br>No of events | n = 57 ; % = 75 | n = 23 ; % = 82 |
| **Asian**<br>No of events | n = 7 ; % = 9 | n = 0 ; % = 0 |
| **Other**<br>No of events | n = 12 ; % = 16 | n = 5 ; % = 18 |
| **Less than $69,999**<br>No of events | n = 22 ; % = 29 | n = 32 ; % = 31 |
| **$70,000 to $89,999**<br>No of events | n = 12 ; % = 16 | n = 15 ; % = 14 |

| Characteristic | Imagery tasks (N = 76) | Neutral imagery - control (N = 28) |
|---|---|---|
| **$90,000 or more**<br><br>No of events | n = 41 ; % = 54 | n = 54 ; % = 52 |

**Outcomes**

**Study timepoints**

Baseline

3 week (Outcomes were measured after 3 weeks)

**Employee outcomes**

| Outcome | Imagery tasks, Baseline, N = 76 | Imagery tasks, 3 week, N = 76 | Neutral imagery - control, Baseline, N = 28 | Neutral imagery - control, 3 week, N = 28 |
|---|---|---|---|---|
| **Mental health symptoms**<br>Self-reported - Pittsburgh Sleep Quality Inventory (PSQI) - means and SDs were pooled by reviewer<br><br>Mean (SD) | 7.7 (2.9) | 6.18 (3.2) | 7.71 (2.65) | 5.88 (2.17) |

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Mental health symptoms - Imagery tasks - Neutral imagery**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study arms**

**Imagery tasks (N = 76)**

| | |
|---|---|
| **Brief name** | Imagery tasks including implementation intentions, arousal reduction, and a combination of the two [pages 262 and 264] |
| **Rationale/theory/Goal** | Success in implementing sleep hygiene behaviours and getting quality sleep in turn promotes sleep self efficacy, thereby fuelling a positive motivational and volitional self-regulation process. [page 261] |
| **Materials used** | A set of laminated, written instructions of their imagery task as well as audiotaped recordings of the instructions [page 264] |
| **Procedures used** | • Participants attended a 30-min group session held at their workplace, during which they completed the pre-session questionnaires and then received training in their imagery tasks.<br>• They listened to audiotaped instructions for visualizing the intervention scenario; these instructions were of comparable length across the four conditions, averaging 2 min and 10 s. |

| | |
|---|---|
| | • Participants were asked to complete the imagery tasks twice daily, at the end of work and just prior to going to bed, for the following 20 workdays (weekends were excluded). Participants were told to put these instructions next to their beds and practice the imagery task within half an hour of going to bed.<br><br>Implementation intention:<br><br>• Participants received instructions to visualize a specific plan for obtaining quality sleep each night through the practice of established sleep hygiene practices. They visualized the process of changing into comfortable clothes and relaxing prior to going to bed, the time they planned to go to sleep, where they planned to sleep, and the bedtime routine they follow to help them to get to sleep. These instructions were framed according to a modified structure for implementation intentions, with statements to imagine that when it is a particular time (e.g., a half-hour before bedtime) and one is in a particular place (e.g., at home), then one engages in a set of behaviours (e.g., sitting down and relaxing quietly).<br>• At bedtime, they were instructed to mentally run through a checklist of these behaviours and then do any behaviours that they had not yet completed. These actions only related to positive sleep-related behaviours due to the possibility that instructions to avoid negative behaviours (e.g., “Do not use alcohol four hours before bedtime”) could trigger ironic effects of participants being more tempted to engage in these behaviours.<br><br>Arousal Reduction<br><br>• Participants received instructions to imagine a scenario of wearing a backpack loaded with their worries, then putting the heavy backpack down, and then experiencing the relief and freedom from tension.<br><br>Combined Arousal Reduction and Implementation Intentions<br><br>• Participants engaged in both arousal reduction and implementation intention imagery. |

| | |
|---|---|
| | [pages 262 and 264] |
| **Provider** | Not reported |
| **Method of delivery** | Group training [page 262] |
| **Setting/location of intervention** | Workplace [page 262] |
| **Intensity/duration of the intervention** | 30 minute group activity and twice daily practice [pages 262 and 264] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**Neutral-imagery - control (N = 28)**

| | |
|---|---|
| **Brief name** | Neutral-imagery control group [page 264] |
| **Rationale/theory/Goal** | Not applicable |

| | |
|---|---|
| **Materials used** | A set of laminated, written instructions of their imagery task as well as audiotaped recordings of the instructions. [page 264] |
| **Procedures used** | • Participants attended a 30-min group session held at their workplace, during which they completed the pre-session questionnaires and then received training in their imagery tasks. They listened to audiotaped instructions for visualizing the intervention scenario; these instructions were of comparable length across the four conditions, averaging 2 min and 10 s.<br>• Participants in the Control condition were instructed to practice neutral imagery in which they visualized what they usually did between finishing work and going to bed with no other specific instructions.<br>• Participants were asked to complete the imagery tasks twice daily, at the end of work and just prior to going to bed, for the following 20 workdays (weekends were excluded).<br>• Participants were told to put these instructions next to their beds and practice the imagery task within half an hour of going to bed.<br><br>[pages 262 and 264] |
| **Provider** | Not reported |
| **Method of delivery** | Group training [page 262] |
| **Setting/location of intervention** | Workplace [page 262] |
| **Intensity/duration of the intervention** | 30 minute group activity and twice daily practice [pages 262 and 264] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

## D.28 Macias, 2019

| | |
|---|---|
| **Bibliographic Reference** | Macias, Juanjo; Valero-Aguayo, Luis; Bond, Frank W; Blanca, Maria J; The efficacy of functional-analytic psychotherapy and acceptance and commitment therapy (FACT) for public employees.; Psicothema; 2019; vol. 31 (no. 1); 24-29 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To test the efficacy of FACT to promote psychological mental health by addressing complex problems in a public administration setting. |
| **Country/geographical location** | Spain |
| **Setting** | Workplace<br>• Public sector<br>• Government<br>• Large organisation<br>• Contract type - Not specified<br>• Employee level - Not reported but all work with monotonous and repetitive tasks |
| **Inclusion criteria** | • General Health Questionnaire (GHQ-12) ≥ 12 and |

| | |
|---|---|
| | • Maslach Burnout Inventory General-Survey (MBI-GS, exhaustion scale). ≥ 10 |
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | Not reported |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | Power calculation not reported.<br><br>Completer analysis only (no Intention to treat)<br><br>An analysis of covariance (ANCOVA) was conducted on the dependent variables. The differences between groups after treatment were estimated with the differences in pre-test scores removed. A value of p <. 05 was considered to be significant. |
| **Attrition** | 19 / 21 (90.5%) in the intervention group and 19 / 21 (90.5%) in the control group completed the study |
| **Assessments and timepoints** | The following assessment were made at these timepoints<br><br>• Baseline<br>• follow-up (1 week after intervention ended)<br><br>Primary outcome not specified |

| | |
|---|---|
| | Outcomes were<br><br>• General Health Questionnaire-12<br>• Maslach Burnout Inventory General-Survey<br>• Acceptance and Action Questionnaire II<br>• Work-Related Acceptance and Action Questionnaire<br>• Depression, Anxiety and Stress Scale-21 |
| **Study limitations (author)** | • it has not been possible to administer follow-up measures to assess long-term improvements.<br>• the experimental design included a waiting list control group for comparison with the experimental group, which was used to measure the effect of the treatment.<br>• participants were recruited from a single Public Administration Center, thereby restricting the generalizability of the findings. |
| **Study limitations (reviewer)** | • Lack of information who provided / delivered the intervention.<br>• Lack of information on randomisation method |
| **Source of funding** | Marbella city council (Spain). |

**Study arms**

FACT (N = 21)

Functional Analytic Psychotherapy (FAP) and Acceptance and Commitment Therapy (ACT)

Waiting list (N = 21)

**Characteristics**

**Study-level characteristics**

| Characteristic | Study (N = 38) |
|---|---|
| **Age** (years)<br>Completers only<br><br>Mean (SD) | 39.47 (11.76) |
| **Female**<br><br>Sample size | n = 22 ; % = 59 |
| **Male**<br><br>Sample size | n = 16 ; % = 41 |
| **University level**<br><br>Sample size | n = 34 ; % = 90 |
| **Secondary (high) school level**<br><br>Sample size | n = 4 ; % = 10 |

**Outcomes**

**Study timepoints**

Baseline

1 week (6 weeks after baseline (include 5 weeks for intervention))

**Employee outcomes**

| Outcome | FACT, Baseline, N = 21 | FACT, 1 week, N = 21 | Waiting list, Baseline, N = 21 | Waiting list, 1 week, N = 21 |
|---|---|---|---|---|
| **Mental wellbeing**<br>Reported as GHQ-12 Mental Health<br><br>Sample size | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 |
| **Mental wellbeing**<br>Reported as GHQ-12 Mental Health<br><br>Mean (SE) | 15.73 (1.04) | 8.11 (0.8) | 15.42 (0.84) | 15.79 (0.8) |
| **Job stress**<br>reported as Maslach Burnout Inventory-exhaustion<br><br>Sample size | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 |
| **Job stress**<br>reported as Maslach Burnout Inventory-exhaustion<br><br>Mean (SE) | 14.1 (1.82) | 8.51 (1.15) | 12.31 (1.49) | 12.24 (1.19) |
| **Mental health symptoms**<br>Reported as Depression, Anxiety, Stress Scale<br><br>Sample size | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 |
| **Mental health symptoms**<br>Reported as Depression, Anxiety, Stress Scale<br><br>Mean (SE) | 17 (2.34) | 10.56 (2) | 21.63 (2.46) | 16.81 (2) |

| Outcome | FACT, Baseline, N = 21 | FACT, 1 week, N = 21 | Waiting list, Baseline, N = 21 | Waiting list, 1 week, N = 21 |
|---|---|---|---|---|
| **Engagement**<br>Work Related Acceptance and Action Questionnaire<br><br>No of events | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 | n = 19 ; % = 90.5 |
| **Engagement**<br>Work Related Acceptance and Action Questionnaire<br><br>Mean (SE) | 31.94 (1.5) | 37.52 (1.05) | 35.42 (1.34) | 33.69 (1.05) |

Mental wellbeing - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Engagement - Polarity - Higher values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing - FACT vs Waiting list (1 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Job stress - FACT vs Waiting list (1 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Mental health symptoms - FACT vs Waiting list (1 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Engagement - FACT vs Waiting list (1 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**FACT (N = 21)**

| | |
|---|---|
| **Brief name** | Functional-analytic acceptance and commitment therapy. [P 26] |
| **Rationale/theory/Goal** | Based on Functional Analytic Psychotherapy and Acceptance and Commitment Therapy. The integration of ACT and FAP to address complex and daily clinical problems is conceptualized as Functional-Analytic Acceptance and Commitment Therapy [P 24 - 25] |
| **Materials used** | Home practice assignments related to the content of each session along with exercises and metaphors [P 26] |
| **Procedures used** | All sessions were completed individually in order to facilitate openness and adherence to the intervention to produce radical changes in brief periods. All participants in the FACT group attended three individual sessions with 2 session 1 |

| | |
|---|---|
| | week apart and the final session 10 days later to allow for participants to practice the skills learned in the first two sessions.<br><br>The philosophy of the intervention consisted of treating every session as the last one, inducing radical changes. The core processes were: unworkable results of avoidance, acceptance of private experiences, promoting awareness, and the commitment to a meaningful life connected with the presence of distress.<br><br>In the initial session the benefits of the program and what promotes culture were introduced. The control of the problem and experiential avoidance were described, along with individual functional analysis, clarification of values and commitment, creative hopelessness, and finally the self as context (acting with barriers).<br><br>The second session focused on a brief summary of the previous session, including defusion exercises, encouraging awareness and willingness to deal with unpleasant private events (thoughts, sensations, feelings, and emotions), and perspective taking through hierarchical self as context and distinction self as context. FAP was integrated into all exercises, with the purpose of: a) provoking CRB1; and b) reinforcing CRB2 and advancing CRB3. The final session aimed at promoting commitment to value-based living (meaningful life), prevention of relapse, and acceptance of istress. [P 26] |
| **Provider** | Not reported |
| **Method of delivery** | Individual face to face sessions [P 26] |
| **Setting/location of intervention** | Public Administration Center (workplace) [P 26] |
| **Intensity/duration of the intervention** | Three sessions over five weeks, Each session lasted 90 mins. [P 26] |
| **Tailoring/adaptation** | The FACT protocol was delivered using an adaptation of the “two-plus-one” format. p 26] |
| **Unforeseen modifications** | None reported |

| | |
|---|---|
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Waiting list (N = 21)**

| | |
|---|---|
| **Brief name** | Waiting list [P 25] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |

| | |
|---|---|
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.29 Nhiwatiwa, 2003

| | |
|---|---|
| **Bibliographic Reference** | Nhiwatiwa, FG; 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; 2003; vol. 10 (no. 5); 561-568 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To investigate whether knowledge of the effects of trauma and coping (from a booklet) would result in a difference in distress symptoms among nurses who had been physically assaulted by patients. |
| **Country/geographical location** | UK |
| **Setting** | Workplace<br>• Public sector<br>• Healthcare<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | Participants had to be a nurse assaulted by patient(s); and the incident must have occurred at work. |

| | |
|---|---|
| **Exclusion criteria** | Participants were excluded if they were receiving ongoing and regular treatment for stress, PTSD, depression, anxiety and other psychological disorders |
| **Method of randomisation** | Stratified block randomization (2x4 = 8 strata) using random numbers from a statistics textbook |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation not reported<br>• No information on how missing data were dealt with<br>• Mann–Whitney test was used due to the groups being identified as highly skewed with evidence of outliers |
| **Attrition** | The actual number of participants who completed the study and evaluation is not stated. Based on tables it appears there was 0% attrition - but the study lacks detail regarding participant numbers pre-post. |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Endpoint - 3 months<br><br>The primary outcomes were<br><br>• Impact of Events Scale<br>• General Health Questionnaire |
| **Study limitations (author)** | The small sample size reduced the power of the study; The lack of pre-trauma data made it difficult to establish pre-event adjustment of nurses assaulted. Financial constraints resulted in a heavy reliance of self-rating measures, which are |

| | |
|---|---|
| | open to faking. The use of interview-based assessment of distress in supporting self-rating scales used would have improved the precision of the study. The reliance on statistical significance rather than clinical significance was limiting. |
| **Study limitations (reviewer)** | Skewed data at baseline; lack of allocation concealment and randomisation which could introduce bias; Lack of detail regarding participant completion pre-post with this data estimated from graphs with poorly outlined scales; participant characteristics only expressed prior to exclusions and not updated to reflect the make up of the sample that participated in the study (n=40) |
| **Source of funding** | Not reported |

**Study arms**

Education (N = 20)

Brief educational intervention (reading a booklet on effects of trauma and coping)

Assessment only (N = 20)

Outcome questionnaires only with reminders sent for completion

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 40)** |
|---|---|
| **20–29 years**<br><br>Sample size | n = 16 ; % = 40 |
| **30–39 years**<br><br>Sample size | n = 10 ; % = 24.4 |
| **40–49 years**<br><br>Sample size | n = 12 ; % = 28.9 |

| Characteristic | Study (N = 40) |
|---|---|
| **50–59 years**<br><br>Sample size | n = 3 ; % = 6.7 |
| **Ethnicity**<br>Not reported<br><br>Nominal | NR |
| **Registered nurse**<br><br>Sample size | n = 23 ; % = 58 |
| **Other**<br><br>Sample size | n = 17 ; % = 42 |

**Outcomes**

**Study timepoints**

Baseline

3 month (Both groups were re-assessed at 3-month point by completing the IES and GHQ-28 questionnaires )

**Employee outcomes**

| Outcome | Education, Baseline, N = 20 | Education, 3 month, N = 20 | Assessment only, Baseline, N = 20 | Assessment only, 3 month, N = 20 |
|---|---|---|---|---|
| **Job stress**<br>Reported using Impact of Events Scale<br><br>Mean (SD) | 8.4 (13.22) | 10.4 (16.79) | 12.62 (14.48) | 6.62 (8.66) |

| Outcome | Education, Baseline, N = 20 | Education, 3 month, N = 20 | Assessment only, Baseline, N = 20 | Assessment only, 3 month, N = 20 |
|---|---|---|---|---|
| **Mental wellbeing**<br>Reported using General Health Questionnaire 28<br><br>Mean (SD) | 1.8 (1.69) | 3.6 (5.89) | 3.23 (2.28) | 2.31 (2.62) |

Job stress - Polarity - Lower values are better

Mental wellbeing - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Education vs Control (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Mental wellbeing - Education vs Assessment only (Endpoint)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcome)* |

**Study arms**

**Education (N = 20)**

| | |
|---|---|
| **Brief name** | Brief educational booklet |

| | |
|---|---|
| **Rationale/theory/Goal** | Investigate whether knowledge of the effects of trauma and coping (from a booklet) would result in a difference in distress symptoms among nurses who had been physically assaulted by patients. |
| **Materials used** | An educational booklet on the effects of trauma and coping mechanisms (developed by Rose et al.1999) |
| **Procedures used** | • Participants were sent an envelope, containing IES and GHQ-28, clear instructions on the sequence of tasks, the booklet in a sealed envelope with a warning not to open it until instructions have been read and understood.<br>• Participants has to complete both questionnaires and return them in the provided stamped addressed envelope<br>• The participants could then open the sealed envelope containing the booklet and read it at their own pace. They could keep the booklet but had strict instructions not to photocopy, distribute or share the contents of the booklet with anyone.<br>• If completed questionnaires were not received within 2 weeks, reminders were sent and a further reminder was sent 1 week later .<br><br>(Page 562) |
| **Provider** | Not reported |
| **Method of delivery** | Self-help [P 564] |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | The length of time required to read the educational intervention was not specified. [P 564] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not specified |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |
| **Other details** | Nome to add |

**Brief educational intervention (reading a booklet on effects of trauma and coping)**

**Assessment only (N = 20)**

| | |
|---|---|
| **Brief name** | Assessment only [P 564] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants were sent an envelope containing assessments and clear written instructions on the sequence for completing tasks required of them. |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |

| | |
|---|---|
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

**Outcome questionnaires only with reminders sent for completion**

## D.30 Phillips, 2014

| | |
|---|---|
| **Bibliographic Reference** | Phillips, R; Schneider, J; Molosankwe, I; Leese, M; Foroushani, P Sarrami; Grime, P; McCrone, P; Morriss, R; Thornicroft, G; Randomized controlled trial of computerized cognitive behavioural therapy for depressive symptoms: effectiveness and costs of a workplace intervention.; Psychological medicine; 2014; vol. 44 (no. 4); 741-52 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | ISRCTN24529487 |
| **Study start date** | Nov-2009 |
| **Study end date** | Jan-2011 |
| **Aim** | To measure the impact of an interactive computerized CBT programme (MoodGYM) on employees' work-related performance and psychological well-being. |
| **Country/geographical location** | UK |

| | |
|---|---|
| **Setting** | Workplace<br>• Public and private sector<br>• Transport, health and communications<br>• Large organisations<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | • Aged over 18 years,<br>• score of 2 or more on five of the nine items, including 2 or more on item 1 (little interest in doing things) or item 2 (feeling hopeless) on Patient Health Questionnaire-9 (PHQ-9)<br>• confirm that at least one of the items identified as a problem for them made it difficult to work, take care of things at home, or get along with other people. |
| **Exclusion criteria** | • Severe mental problems |
| **Method of randomisation** | Simple (unrestricted) randomization via website |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Power calculation was designed to detect a mean difference of 3 points (clinically significant) on the Work and Social Adjustment Scale (WSAS) 02). With an assumed standard deviation of 9 and 80% power at a 5% significance level, we required 142 participants per arm to complete the study. Assuming a drop-out of 20%, a total of 355 participants was required. |

| | |
|---|---|
| | • A linear, mixed-effect model for longitudinal data (random intercept model) was used to estimate, using maximum likelihood, the difference between treatment arms in WSAS score at 6 and 12 weeks overall (taking account of any time trends). |
| **Attrition** | 102 out of 318 (32.1%) in the intervention group and 129 out of 319 (40,4of the control group completed assessments at week 12. |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• 6 weeks (Endpoint)<br>• 12 weeks (6 week follow-up)<br><br>Primary outcome<br><br>• Work and Social Adjustment Scale (WSAS)<br><br>Secondary outcomes<br><br>• depression (PHQ-9)<br>• distress (CORE10)<br>• Anxiety (GAD)<br>• self-assessed absence from work<br>• acceptability of the online process.<br>• Service use<br>• quality of life (EQ-5D) |
| **Study limitations (author)** | High attrition at 6 weeks and 12 weeks and difficulties in maximising retention; Short follow-up time potentially impacting the efficacy of the intervention; |
| **Study limitations (reviewer)** | A number of individuals who had more severe mental health problems were not excluded as the protocol intended it is unclear how the study authors adjudged the potential impacts on the intervention (n=22 to MoodGYM and n=19 to the control arm). |

| | |
|---|---|
| **Source of funding** | The study was funded by the British Occupational Health Research Foundation. |

**Study arms**

Computerized CBT (N = 318)

MoodGYM

Attentional control (N = 319)

Signposted to websites with general information about mental health

**Characteristics**

**Arm-level characteristics**

| **Characteristic** | **Computerized CBT (N = 318)** | **Attentional control (N = 319)** |
|---|---|---|
| **Age**<br>Mean (SD) | 42.2 (9.6) | 42.7 (9.6) |
| **Male**<br>Sample size | n = 136 ; % = 43 | n = 160 ; % = 50 |
| **Female**<br>Sample size | n = 176 ; % = 55 | n = 152 ; % = 48 |
| **Missing**<br>Sample size | n = 6 ; % = 2 | n = 7 ; % = 2 |

**Outcomes**

**Study timepoints**

Baseline

6 week (6 weeks follow-up)

**Employee outcomes**

| Outcome | Computerized CBT, Baseline, N = 318 | Computerized CBT, 6 week, N = 318 | Attentional control, Baseline, N = 319 | Attentional control, 6 week, N = 319 |
|---|---|---|---|---|
| **Job performance**<br>Reported using Work and Social Adjustment Scale<br><br>Sample size | n = 317 ; % = 99.7 | n = 102 ; % = 47.8 | n = 319 ; % = 100 | n = 129 ; % = 40.4 |
| **Job performance**<br>Reported using Work and Social Adjustment Scale<br><br>Mean (SD) | 19.9 (8) | 15 (10.1) | 20 (7.7) | 15.9 (8.6) |
| **Mental health symptoms**<br>Depression reported using PHQ-9<br><br>Sample size | n = 311 ; % = 97.8 | n = 97 ; % = 30.5 | n = 318 ; % = 99.7 | n = 122 ; % = 38.2 |
| **Mental health symptoms**<br>Depression reported using PHQ-9<br><br>Mean (SD) | 14.6 (5.4) | 9.3 (6.9) | 14.6 (5.6) | 10.3 (6.9) |
| **Job stress**<br>Reported using CORE10<br><br>Sample size | n = 316 ; % = 99.4 | n = 101 ; % = 31.8 | n = 318 ; % = 99.7 | n = 129 ; % = 40.4 |

| Outcome | Computerized CBT, Baseline, N = 318 | Computerized CBT, 6 week, N = 318 | Attentional control, Baseline, N = 319 | Attentional control, 6 week, N = 319 |
|---|---|---|---|---|
| **Job stress**<br>Reported using CORE10<br><br>Mean (SD) | 18.4 (5.9) | 14.1 (7.3) | 18.3 (5.3) | 15 (6.9) |

Job performance - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job performance - MoodGYM vs Control (12 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Attrition rate > 50%)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(HIgh loss to follow-up and self reported outcome)* |

**Mental health symptoms - Computerized CBT vs Attentional control (12 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Attrition rate > 50%)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(HIgh loss to follow-up and self reported outcome)* |

**Job stress - Computerized CBT vs Attentional control (12 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns<br>*(Attrition rate > 50%)* |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns<br>*(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | High<br>*(HIgh loss to follow-up and self reported outcome)* |

**Study arms**

**Computerized CBT (N = 318)**

| | |
|---|---|
| **Brief name** | Computerized cognitive behavioural therapy [P 742] |
| **Rationale/theory/Goal** | Based on cognitive-behaviour therapy [P 741] |

| | |
|---|---|
| **Materials used** | Website modules [P 742] |
| **Procedures used** | All participants were required to give a telephone number as a condition of joining the study. Weekly telephone calls were made, lasting about 10 min on average, with three purposes: to maintain engagement with the study; to screen for risk; and to collect service<br>use data for costing purposes. [P 742] |
| **Provider** | Telephone input was provided by the Mental Health Research Network's clinical studies officers. [P 742] |
| **Method of delivery** | MoodGYM is delivered online and allows participants to proceed at their own pace over five, 1 hour long modules, usually taken weekly [P 742] |
| **Setting/location of intervention** | Workplace [742]. |
| **Intensity/duration of the intervention** | Five 1 hour long modules, usually taken weekly. Weekly telephone calls were made, lasting about 10 min on average. [P 742] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Attentional control (N = 319)**

| | |
|---|---|
| **Brief name** | Attentional control [P 742] |
| **Rationale/theory/Goal** | Information provision via a list fo website [P 742] |

| | |
|---|---|
| **Materials used** | Websites [P 742] |
| **Procedures used** | As a condition of joiining the study all participants were required to give a phone number. The received weekly 10 minute calls to:<br><br>• to maintain engagement<br>• to screen for risk<br>• collect service use data for costing purposes. The telephone input [P 742] |
| **Provider** | The phone calls were provided to both arms of the trial by the Mental Health Research Network's clinical studies officers. [P 742] |
| **Method of delivery** | Online [P 742] |
| **Setting/location of intervention** | Workplace [P 742] |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.31 Prado, 2018

| | |
|---|---|
| **Bibliographic Reference** | Prado, Juliana Miyuki do; Kurebayashi, Leonice Fumiko Sato; Silva, Maria Julia Paes da; Experimental and placebo auriculotherapy for stressed nurses: randomized controlled trial.; Revista da Escola de Enfermagem da U S P; 2018; vol. 52; e03334 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Brazilian Registry of Clinical Trials: RBR-req2792 |
| **Study start date** | 2014 |
| **Study end date** | 2014 |
| **Aim** | To compare the efficacy of experimental auriculotherapy and placebo auriculotherapy with sham points for the treatment of stress in nurses of a charity hospital |
| **Country/geographical location** | São Paulo, Brazil |
| **Setting** | Workplace<br>• Public sector<br>• Healthcare industry (Hospital)<br>• Large organisation<br>• Contract type - not reported<br>• Seniority - Mixed |
| **Inclusion criteria** | • Medium and high stress level (between 40 and 110 points on the List of Stress Symptoms)<br>• voluntary participation and |

| | |
|---|---|
| | • availability for the auriculotherapy sessions. |
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | Random Allocation Software |
| **Method of allocation concealment** | Single blind study - participants were blinded no evidence of allocation concealment or strategies to blind those delivering interventions or allocation concealment. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | No power calculation reported<br><br>No information on how missing data was dealt with<br><br>Mean and standard deviation - other statistical analysis was undertaken Fisher's exact test; repeated measures analysis of variance (ANOVA) was used, with Tukey's post-hoc test for inferential analysis |
| **Attrition** | 47/56 (83.9%) of the auriculotherapy group, 47/56 (83.9%) of the sham auriculotherapy group and 43/56 (76.8%) of the waiting list group completed the study |
| **Assessments and timepoints** | The following assessments were made at these times<br><br>• Baseline<br>• Endpoint (6 weeks after baseline)<br>• Follow-up (15 days after endpoint)<br><br>Primary outcome<br><br>• Stress Symptom List |

| | |
|---|---|
| | No other outcomes reported |
| **Study limitations (author)** | The main limitation outlined was not using electrical devices or other more accurate methods of locating active and non-reactive auricular points for the definition of sham points. |
| **Study limitations (reviewer)** | Use of sham auricular points for comparison arm that may have elicited an effect on outcomes without a full understand of this. Lack of ITT analysis. Lack of allocation concealment. >20% attrition across study arms. Sample predominantly female (>93% across study arms - p=0.7); morning and afternoon shift workers; single and married. |
| **Source of funding** | Not reported |

**Study arms**

Auriculotherapy (N = 56)

experimental auriculotherapy

Placebo (N = 56)

Placebo auriculotherapy with sham points

Waiting list (N = 56)

Without any treatment and put on a waiting list

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 133)** |
|---|---|
| **Age**<br><br>Mean (SD) | 35 (8.4) |

**Arm-level characteristics**

| Characteristic | Auriculotherapy (N = 56) | Placebo (N = 56) | Waiting list (N = 56) |
|---|---|---|---|
| **Female**<br><br>Sample size | n = 40 ; % = 93 | n = 44 ; % = 93.6 | n = 42 ; % = 97.6 |
| **Male**<br><br>Sample size | n = 3 ; % = 7 | n = 3 ; % = 6.4 | n = 1 ; % = 2.3 |
| **Management**<br><br>Sample size | n = 11 ; % = 25.6 | n = 6 ; % = 12.8 | n = 9 ; % = 20.9 |
| **Care**<br><br>Sample size | n = 32 ; % = 74.4 | n = 41 ; % = 87.2 | n = 34 ; % = 79.1 |

**Outcomes**

**Study timepoints**

Baseline

15 day (15 days follow-up (after endpoint))

**Employee outcomes**

| Outcome | Auriculotherapy, Baseline, N = 56 | Auriculotherapy, 15 day, N = 56 | Placebo, Baseline, N = 56 | Placebo, 15 day, N = 56 | Waiting list, Baseline, N = 56 | Waiting list, 15 day, N = 56 |
|---|---|---|---|---|---|---|
| **Job stress** Stress Symptom List (LSS)<br><br>Sample size | n = 43 ; % = 76.8 | n = 43 ; % = 76.8 | n = 47 ; % = 83.9 | n = 47 ; % = 83.9 | n = 43 ; % = 76.8 | n = 43 ; % = 76.8 |

| Outcome | Auriculotherapy, Baseline, N = 56 | Auriculotherapy, 15 day, N = 56 | Placebo, Baseline, N = 56 | Placebo, 15 day, N = 56 | Waiting list, Baseline, N = 56 | Waiting list, 15 day, N = 56 |
|---|---|---|---|---|---|---|
| **Job stress** Stress Symptom List (LSS)<br><br>Mean (SD) | 72.4 (17.9) | 41.3 (16.4) | 66.7 (17.3) | 51.8 (27) | 69.3 (17.8) | 66.8 (27.6) |

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Auriculotherapy vs Control (15 day follow-up)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Some concerns |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure was self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

Auriculotherapy (N = 56)

| | |
|---|---|
| **Brief name** | Auriculotherapy 4[P |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not reported |
| **Procedures used** | For the auriculotherapy group, two points with calming properties were used, the Shenmen point and the Brainstem. |
| **Provider** | Not reported |
| **Method of delivery** | In person [P 3] |
| **Setting/location of intervention** | Workplace [P 3] |
| **Intensity/duration of the intervention** | 12 sessions twice a week; Control group only participated in the evaluation. |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |

| | |
|---|---|
| **Actual treatment fidelity** | Not reported |

**Placebo (N = 56)**

| | |
|---|---|
| **Brief name** | Sham auriculotherapy [P 3] |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not reported |
| **Procedures used** | Not reported 'sham points' (External Ear and Face Area); The control group were placed on a waiting list. |
| **Provider** | Not reported |
| **Method of delivery** | In person [P 3] |
| **Setting/location of intervention** | Workplace [P 3] |
| **Intensity/duration of the intervention** | 12 sessions over 6 weeks (sessions twice weekly) [P 3] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Placebo auriculotherapy with sham points**

Waiting list (N = 56)

| | |
|---|---|
| **Brief name** | Waiting list [P 3] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |

## D.32 Rajeswari, 2019

| | |
|---|---|
| **Bibliographic Reference** | Rajeswari, H.; Sreelekha, B.K.; Nappinai, S.; Subrahmanyam, U.; Rajeswari, V.; Outcome of accelerated recovery programme on occupational stress among nurses; Indian Journal of Public Health Research and Development; 2019; vol. 10 (no. 12); 127-132 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Study start date** | Apr-2015 |
| **Study end date** | Mar-2017 |
| **Aim** | To measure the outcome of the Accelerated Recovery programme in reducing occupational stress among nurses. |
| **Country/geographical location** | India |
| **Setting** | Workplace:<br>• Sector: public<br>• Industry: healthcare<br>• Organisation size: large<br>• Contract type: not reported<br>• Seniority: not reported<br>• Income: professional (nurses) |
| **Inclusion criteria** | Nurses who scored >30 in Index of clinical stress |
| **Exclusion criteria** | Nurses who already participated in Neurolinguistic programming, Cognitive behavior therapy, and stress management |
| **Method of randomisation** | Not reported |

| | |
|---|---|
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Descriptive statistics like mean (M) and standard deviation (SD) were used<br>• Inferential statistics like Wilcoxon signed-rank test, Mann Whitney U test and repeated measure ANOVA were used<br>• Statistical significance was set at $p < 0.05$.<br>• Using power analysis, the sample size was calculated, which was 117 and was rounded off to 120.<br>• Analysis type (for example ITT) was not specified |
| **Attrition** | Attrition not reported |
| **Assessments and timepoints** | The outcome of occupational stress was measured at the following timepoints:<br>• Baseline<br>• 5 weeks<br>• 3 months<br>• 6 months<br>• 9 months<br>• 12 months |
| **Study limitations (author)** | Not reported |
| **Study limitations (reviewer)** | Outcome measures were self-reported |
| **Source of funding** | Self-funded |

**Study arms**

Accelerated recovery programme (N = 60)

60 participants were randomised to the intervention arm

Control group (N = 60)

60 participants were randomised to the control arm

**Characteristics**

**Arm-level characteristics**

| Characteristic | Accelerated recovery programme (N = 60) | Control group (N = 60) |
|---|---|---|
| **Age**<br>Aged 21 to 30 years - n calculated by reviewer from percentage<br><br>No of events | n = 35 ; % = 58.4 | n = 32 ; % = 53.4 |
| **Gender**<br>Women - n calculated by reviewer from percentage<br><br>No of events | n = 54 ; % = 90 | n = 50 ; % = 83.3 |
| **Socioeconomic - educational level**<br>B.Sc(N) as professional qualification<br><br>No of events | n = 52 ; % = 86.7 | n = 43 ; % = 71.7 |

**Outcomes**

**Study timepoints**

Baseline

12 month (12-month post-test)

**Employee outcomes**

| Outcome | Accelerated recovery programme , Baseline, N = 60 | Accelerated recovery programme , 12 month, N = 60 | Control group, Baseline, N = 60 | Control group, 12 month, N = 60 |
|---|---|---|---|---|
| **Job stress** (0 - 100)<br>Self-reported - Index of Clinical Stress - significant stress is greater than 30<br><br>Mean (SD) | 72.54 (7.58) | 43.03 (5.66) | 73.78 (8.41) | 74.52 (8.33) |

Job stress - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Job stress - Accelerated recovery programme - Control group**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |

| Section | Question | Answer |
|---|---|---|
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**Accelerated recovery programme (N = 60)**

| | |
|---|---|
| **Brief name** | Accelerated recovery programme [page 127 -abstract] |
| **Rationale/theory/Goal** | Accelerated Recovery programme (ARP) is a package that includes self care measures, guided imagery, neuro-linguistic programme, and thought field therapy [page 128] |
| **Materials used** | Not reported |
| **Procedures used** | • On day one, using Index of clinical stress, pre-test data was collected.<br>• The session involves listening to audios, didactic and experiential training.<br>• The first session is assessment of the condition with the practice of guided imagery.<br>• Second session involves the construction of a personal and professional time-line.<br>• Session three, involves development of a self-management plan, thought field therapy and Neuro-linguistic.<br>• Session four focuses on supervising the self where the 'Letter from the Great Supervisor' is read by the nurse.<br>• Session five evaluates the programme goals address the pathways for recovery and closure.<br><br>[page 128] |
| **Provider** | Not reported |
| **Method of delivery** | Group sessions [page 128] |
| **Setting/location of intervention** | After the work schedule [page 128] |

| | |
|---|---|
| **Intensity/duration of the intervention** | Five-weeks with five sessions, each lasting for 90-120 minutes [page 128] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | The intervention has an individualised standard treatment protocol [page 129] |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**Control group (N = 60)**

| | |
|---|---|
| **Brief name** | Control [page 128] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | • On day one, using Index of clinical stress, pre-test data was collected.<br>• Participants underwent routine activities for five weeks.<br><br>[page 128] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |

| | |
|---|---|
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.33 Seo, 2020

| | |
|---|---|
| **Bibliographic Reference** | Seo, J.-G.; Choi, S.-H.; Lee, D.-Y.; The study of swedish massage on anxiety situation and ppt in stressed office workers; Medico-Legal Update; 2020; vol. 20 (no. 1); 2027-2041 |

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To investigate the effects of Swedish massage on anxiety and pressure pain threshold in office workers with psycological stress. |

| | |
|---|---|
| **Country/geographical location** | South Korea |
| **Setting** | Workplace:<br>• Sector: not reported<br>• Industry: not reported<br>• Organisation size - not reported<br>• Contract type: not reported<br>• Seniority: not reported<br>• Income: not reported (office workers) |
| **Inclusion criteria** | Stressed office workers with 9 points or more on a Psychological Wellbeing Index-short form scale, who work at K branch in D city. |
| **Exclusion criteria** | • Skin conditions<br>• History of thrombosis treatment<br>• Prescription medicine related to the cardiovascular system<br>• No agreeing to perform the same daily activities as usual |
| **Method of randomisation** | Not details reported |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |

| | |
|---|---|
| **Statistical method(s) used to analyse the data** | • One-Way ANOVA test was used to analyse the general characteristics of the participants.<br>• For the normality test between the two groups, Kolmogorov-Smirnov was used, and for the change of dependent variables before and after the intervention, the corresponding sample t-test was used, and One-Way ANOVA was used to compare the effects between the two groups. All statistical significance probability(alpha) of the data were 0.05.<br>• ITT - no attrition<br>• No power calculations were reported |
| **Attrition** | No attrition |
| **Assessments and timepoints** | The following outcomes were measured:<br><br>• State trait anxiety inventory (STAI)<br>• Pressure pain threshold (PPI)<br><br>At the following timepoints:<br><br>• Before massage<br>• After massage |
| **Study limitations (author)** | • Difficult to generalise the findings as only stressed workers participated in the study<br>• The single measurement design of the intervention does not reveal how long the actual effect will last |
| **Study limitations (reviewer)** | Outcome measures were self-reported |
| **Source of funding** | Self-funded |

**Study arms**

Swedish massage (N = 30)

30 participants were randomised to a Swedish massage group.

Resting group (N = 30)

30 participants were randomised to a resting group control.

**Characteristics**

**Arm-level characteristics**

| Characteristic | Swedish massage (N = 30) | Resting group (N = 30) |
|---|---|---|
| **Age**<br><br>Mean (SD) | 37.4 (*empty data*) | 37.8 (*empty data*) |

**Outcomes**

**Study timepoints**

Baseline

0 hour (Outcomes were measured post-intervention)

**Employee outcomes**

| Outcome | Swedish massage, Baseline, N = 30 | Swedish massage, 0 hour, N = 30 | Resting group, Baseline, N = 30 | Resting group, 0 hour, N = 30 |
|---|---|---|---|---|
| **Mental health symptoms** (0-68) Self-reported - State Trait Anxiety Inventory<br><br>Mean (SD) | 36.8 (4.67) | 30.57 (4.65) | 36.47 (4.83) | 36.77 (4.28) |

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employee outcomes - Mental health symptoms - Swedish massage - Resting group**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measures were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-reported outcomes)* |

**Study arms**

**Swedish massage (N = 30)**

| | |
|---|---|
| **Brief name** | Swedish massage [page 2038] |
| **Rationale/theory/Goal** | Swedish massage is a method that can effectively apply the five (effleurage, petrissage, frication tapoment, vibration) according to each situation. [page 2038] |

| | |
|---|---|
| **Materials used** | Massage table and knee support [page 2038] |
| **Procedures used** | • Participants were placed on the massage table and a wedge-shaped knee support was placed under the knee at 70 degree flexion of the hip.<br>• Relaxation was allowed.<br>• After the experiment began, it blocked conversation, phone sounds, other noises, and electromagnetic waves that could act as variables in the experiment, minimizing the irritation of the surroundings, preventing the subject from sleeping during the experiment, and closing the eyes and taking part in the experiment comfortably.<br>• Swedish massage was performed twice on the neck and shoulder for 10 minutes each session.<br><br>[page 2038] |
| **Provider** | Massage majors [page 2038] |
| **Method of delivery** | Individual one-to-one [page 2038] |
| **Setting/location of intervention** | Comfortable, light treatment room where the temperature was maintained between 22 and 24 degrees C. [page 2038] |
| **Intensity/duration of the intervention** | 20 minutes [page 2038] |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

| | |
|---|---|
| **Other details** | None |

**Rest (N = 30)**

| | |
|---|---|
| **Brief name** | Rest [2038] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Massage table and knee support [page 2038] |
| **Procedures used** | • Participants were placed on the massage table and a wedge-shaped knee support was placed under the knee at 70 degree flexion of the hip.<br>• Relaxation was allowed.<br>• After the experiment began, it blocked conversation, phone sounds, other noises, and electromagnetic waves that could act as variables in the experiment, minimizing the irritation of the surroundings, preventing the subject from sleeping during the experiment, and closing the eyes and taking part in the experiment comfortably.<br>  ○ Participants rested in the lying position for 20 minutes.<br><br>[page 2038] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Comfortable, light treatment room where the temperature was maintained between 22 and 24 degrees C. [page 2038] |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |

| | |
|---|---|
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.34 Taimela, 2008

**Bibliographic Reference** Taimela, S. Malmivaara, A. Justen, S. Laara, E. Sintonen, H. Tiekso, J. Aro, T.; The effectiveness of two occupational health intervention programmes in reducing sickness absence among employees at risk. Two randomised controlled trials; OCCUPATIONAL AND ENVIRONMENTAL MEDICINE; 2008; vol. 65 (no. 4); 236-241

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Study start date** | 01-Sep-2004 |
| **Study end date** | 30-Sep-2005 |
| **Aim** | To evaluate the effectiveness of two occupational health intervention programmes, both compared with usual care. |
| **Country/geographical location** | Finland |
| **Setting** | Workplace:<br>• Sector: private |

| | |
|---|---|
| | • Industry: construction industry including repair, service and maintenance of buildings, industrial installations or communications networks<br>• Organisation size: large<br>• Contract type: not reported<br>• Seniority: not reported<br>• Income: 62% were blue-collar workers |
| **Inclusion criteria** | High risk- at least one of the criteria fulfilled:<br><br>• Impairment due to musculoskeletal problems at work: ≥5 (scale 0–10)<br>• Potential depression: DEPS score >11 (scale 0–30)<br>• Distress: ‘‘Very much’’ feeling tense, strained, nervous and/or anxious because things are on one’s mind all the time<br>• Fatigue: ‘‘Very much’’ feeling of being squeezed empty because of work<br>• Sleep disturbances: Problems in falling asleep or night awakenings AND daytime tiredness daily or almost daily<br>• Future working ability: Uncertain of own ability or quite sure of not being able to continue in the present job due to health problems<br><br>Intermediate risk- At least one of the criteria fulfilled, but none of the criteria for ‘‘high risk’’ fulfilled:<br><br>• Impairment due to musculoskeletal problems at work: 4 (scale 0–10)<br>• Impairment due to musculoskeletal problems at leisure time activities: ≥5 (scale 0–10)<br>• Pain (frequency and intensity): At least ‘‘moderate’’ pain that ‘‘affects working ability’’ at minimum three times a week<br>• Weight problems; BMI (body mass index) >30 or BMI ≤18.5<br>• Excess alcohol consumption24 Males >350 ml/week; Females >240 ml/week (expressed as absolute alcohol)<br>• Mood disturbances: DEPS score ≥8, (scale 0–30)<br>• Sleep disturbances: Problems in falling asleep or night awakenings AND daytime tiredness three times a week or more<br>• Daytime sleepiness: Epworth sleepiness scale (ESS) score ≥8 (scale 0–24)<br>• Suspicion of sleep apnoea: Snoring and shortness of breath while asleep daily or almost daily<br>• Insufficient sleep: Difference between reported need and the realisation of sleep ≥2 h |

| | |
|---|---|
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | After collecting all responses and processing the risk group classification, a research assistant randomised each subject in the HR and IR groups into one of the two subgroups, intervention and control (‘‘high risk’’: HR-IG and HR-CG; ‘‘intermediate risk’’: IR-IG and IR-CG). First, to ensure a balanced distribution of subjects by age, scripted four-digit identification codes (ID) were sorted by age within both RCTs and then all other items but the ID codes were removed from the list of subjects. An IT expert did this first step. After that the research assistant performed the randomisation in blocks of 10. A biostatistician had prepared the order from a random number table. Neither were they able to identify the individuals based on the IDs, and could not therefore predict the group assignments. The coding was opened only after the primary analysis of the follow-up data was completed. |
| **Method of allocation concealment** | The research assistant and researchers were not aware of which of the codes belonged to the intervention group and which to the control group in either trial. |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Intention-to-treat analysis was performed<br>• The effectiveness of the interventions was estimated by the difference of mean number of sickness absence days between the randomised groups, and the confidence interval was computed based on t distribution.<br>• Sample size calculations:<br>  ○ High risk group - The target sample size of 420 employees was based on the assumptions that 360 of them can be followed-up for one year, and that there will be a 15% difference between the groups in sickness absence with the mean baseline sickness absence estimated to be 20 (SD 9) days/year. Assuming a normal distribution for the outcome variable this gave an alpha of 0.05 with 80% power.<br>  ○ Intermediate risk group - The original target sample size of 840 employees was based on the assumptions that 686 of them can be followed-up for one year, and that there will be an 11% difference between the groups in sickness absence with the mean baseline sickness absence estimated to be 11 (SD 5) days/year. This gave an alpha of 0.05 with 80% power. However, at the time of randomisation, there were only 537 subjects eligible for the IR group. We reviewed the power calculation: our sample size was sufficient to detect a 14% difference. |

| | |
|---|---|
| **Attrition** | Data was not available due to employment termination:<br>• High risk intervention group - 17/209 (8%)<br>• High risk control group - 17/209 (8%)<br>• Intermediate risk intervention group - 17/268 (6%)<br>• Intermediate risk control group - 15/269 (6%) |
| **Assessments and timepoints** | The following outcomes were assessed;<br>• sickness absence from work<br>At the following timepoints:<br>• baseline<br>• 12 months |
| **Study limitations (author)** | • As there was no initial randomisation to getting a screening questionnaire or not, our study cannot genuinely answer the overall question of whether the screening programme as a whole was effective.<br>• Control arm contamination could have occurred<br>• Heavily skewed distribution of sickness absence |
| **Study limitations (reviewer)** | None |

**Study arms**

High risk - occupational health consultation (N = 209)

209 participants from the high risk group were randomised to receive and occupational health consultation.

High risk - usual care (N = 209)

209 participants from the high risk group were randomised to receive usual care.

Intermediate risk - medical counselling (N = 268)

268 participants from the intermediate risk group were randomised to receive medical counselling.

Intermediate risk - usual care (N = 269)

269 participants from the intermediate risk group were randomised to receive usual care.

**Characteristics**

**Arm-level characteristics**

| Characteristic | High risk - occupational health consultation (N = 209) | High risk - usual care (N = 209) | Intermediate risk - medical counselling (N = 268) | Intermediate risk - usual care (N = 269) |
|---|---|---|---|---|
| **Age**<br><br>Mean (SD) | 46.7 (*empty data*) | 46.8 (*empty data*) | 42.8 (*empty data*) | 42.9 (*empty data*) |
| **Gender**<br>Women<br><br>No of events | % = 6 | % = 6 | % = 13 | % = 12 |
| **Socioeconomic**<br>Blue-collar workers - n calculated from percentage by reviewer<br><br>No of events | % = 77 | % = 80 | % = 58 | % = 57 |

**Outcomes**

**Study timepoints**

Baseline

1 year (Outcomes were measured one year after baseline measures)

**Employer outcomes**

| Outcome | High risk - occupational health consultation, Baseline, N = 209 | High risk - occupational health consultation, 1 year, N = 209 | High risk - usual care, Baseline, N = 209 | High risk - usual care, 1 year, N = 209 | Intermediate risk - medical counselling, Baseline, N = 268 | Intermediate risk - medical counselling, 1 year, N = 268 | Intermediate risk - usual care, Baseline, N = 269 | Intermediate risk - usual care, 1 year, N = 269 |
|---|---|---|---|---|---|---|---|---|
| **absenteeism** Obtained from employer records<br><br>Sample size | n = 209 ; % = 100 | n = 192 ; % = 91.9 | n = 209 ; % = 100 | n = 192 ; % = 91.9 | n = 268 ; % = 100 | n = 251 ; % = 93.7 | n = 269 ; % = 100 | n = 254 ; % = 94.4 |
| **absenteeism** Obtained from employer records<br><br>Mean (SD) | 19.7 (37) | 19.3 (44) | 17.9 (36.3) | 29.9 (53.3) | 5.9 (11.5) | 7 (12.4) | 4.6 (9.5) | 6.9 (14.3) |

absenteeism - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Employer outcomes - absenteeism - High risk - occupational health consultation - High risk - usual care - Intermediate risk - medical counselling - Intermediate risk - usual care**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Low |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Low |

**Study arms**

**High risk - occupational health consultation (N = 209)**

| | |
|---|---|
| **Brief name** | Occupational health consultation [page 237] |
| **Rationale/theory/Goal** | The main purpose of the consultation was the construction of an action plan, and if appropriate, referral to a further consultation by a specialist, or psychologist. [page 237] |
| **Materials used** | Not reported |
| **Procedures used** | • Employees received a letter with personal feedback of their questionnaire results and invitation to a consultation at the occupational health services.<br>• The occupational nurse first started the consultation, and an occupational physician joined the meeting later if needed.<br>• The individual findings of the questionnaire were available for the OHS professionals during the consultation. |

| | |
|---|---|
| | • To find out what actions were taken within the intervention, an occupational nurse wrote a personal file for each employee at the end of the follow-up. The personal files included information about the employee attending to the consultation, the referrals to further evaluation or interventions, the health advice received at the OHS, the considerations of OHS professionals that no further actions were needed, and the refusals of some employees to take further action. Additionally, the nurses reported if the employee had already received treatment at the OHS for the health issues that were the reason for the invitation of consultation.<br><br>[page 237] |
| **Provider** | Occupational nurse or occupational physician [page 237] |
| **Method of delivery** | One-to-one session [page 237] |
| **Setting/location of intervention** | Occupational health services [page 237] |
| **Intensity/duration of the intervention** | The planned session length was 90 minutes [page 237] |
| **Tailoring/adaptation** | Key treatment processes were defined in advance and the policies and practices at the occupational health centres were not altered as a result of the study. [page 237] |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**High risk - usual care (N = 209)**

| | |
|---|---|
| **Brief name** | Usual care [page 237] |

| | |
|---|---|
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Participants could consult their occupational nurse or physician on request, but they were not invited for a consultation and did not receive feedback of their results. [page 237] |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

**Intermediate risk - medical counselling (N = 268)**

| | |
|---|---|
| **Brief name** | Telephone health counselling [page 237] |
| **Rationale/theory/Goal** | Telephone health counselling has been marketed as a low-cost intervention. [page 236] |
| **Materials used** | Not reported |

| | |
|---|---|
| **Procedures used** | • Participants had access to medical counselling over the telephone from one phone advice centre.<br>• Employees received a letter with personal feedback of their results and invitation to call the phone advice centre in order to receive respective medical advice. Two reminders were sent.<br>• The switchboard was always open, and the cost for the telephone call was the same as for a local call.<br>• During the counselling the individual findings of the questionnaire were available for the nurses who also had access to relevant health databases while providing the health advice. |
| **Provider** | All telephones were manned by trained nurses with several years of experience and specific training for their job. [page 237] |
| **Method of delivery** | Telephone one-to-one [page 237] |
| **Setting/location of intervention** | The switchboard was always open [page 237] |
| **Intensity/duration of the intervention** | Not reported |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None |

**Intermediate risk - usual care (N = 269)**

| | |
|---|---|
| **Brief name** | Usual care [page 237] |
| **Rationale/theory/Goal** | Not applicable |

| | |
|---|---|
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None |

## D.35 Tarquini, 2016

| | |
|---|---|
| **Bibliographic Reference** | Tarquini, Matteo; Di Trani, Michela; Solano, Luigi; Effects of an expressive writing intervention on a group of public employees subjected to work relocation.; Work (Reading, Mass.); 2016; vol. 53 (no. 4); 793-804 |

**Study details**

| | |
|---|---|
| **Study design** | Non-randomised controlled trial (NRCT) |

| | |
|---|---|
| **Trial registration number** | Not reported |
| **Aim** | The aim of our study was to examine the effectiveness of the expressive writing on occupational burnout, alexithymia and psychological well-being in a group of employees subjected to work relocation. |
| **Country/geographical location** | Italy |
| **Setting** | Workplace<br>• Public sector<br>• Tourism<br>• Small organisation<br>• Contract type - Mix of permanent and co-operative<br>• Seniority - Non managerial (administrative or information desk staff) |
| **Inclusion criteria** | • Non-manager employees subject to relocation |
| **Exclusion criteria** | • Managers who were aware of the study |
| **Method of randomisation** | Office employees kin one location were allocated to the intervention and employees of the second location were allocated to the control group. |
| **Method of allocation concealment** | • Not reported |
| **Unit of allocation** | Cluster |
| **Unit of analysis** | Individual |

| | |
|---|---|
| **Statistical method(s) used to analyse the data** | • Power calculation not reported<br>• No information on how missing data were dealt with<br>• To test homogeneity, intervention and control groups were compared according to independent social, demographic and health variables and independent variables at baseline, using the χ2 test for categorical variables and Analysis of Variance for continuous variables.<br>• To test the hypotheses, repeated measures ANOVA were used using group (Writing vs Control) and time (baseline vs 1 month after the end of procedure vs 7 months after the end of procedure) as independent variables and the outcome measures as dependent variables. |
| **Attrition** | None reported |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• 1 month after last session<br>• 7 months after last session<br><br>Primary outcome not specified<br><br>Outcomes were<br><br>• Maslach Burnout Inventory<br>• Toronto Alexithymia Scale<br>• Ryff Psychological Well-Being |
| **Study limitations (author)** | Authors suggest that in future studies include<br><br>• larger sample sizes<br>• other outcomes e.g. days of absence |

| | |
|---|---|
| **Study limitations (reviewer)** | • Limited to one very specific public sector |
| **Source of funding** | Not reported |

**Study arms**

Expressive writing (N = 18)

Pennebaker's writing technique

No intervention (N = 17)

**Characteristics**

**Arm-level characteristics**

| Characteristic | Expressive writing (N = 18) | No intervention (N = 17) |
|---|---|---|
| **Age**<br><br>Mean (SD) | 49.72 (10.93) | 50.18 (9.68) |
| **Male**<br><br>Sample size | n = 9 ; % = 50 | n = 8 ; % = 47 |
| **Female**<br><br>Sample size | n = 9 ; % = 50 | n = 9 ; % = 53 |
| **Socio economic - educational level**<br>years of education<br><br>Mean (SD) | 14.17 (1.82) | 14.53 (3.61) |
| **Administration** | n = 6 ; % = 33.3 | n = 10 ; % = 58.8 |

| Characteristic | Expressive writing (N = 18) | No intervention (N = 17) |
|---|---|---|
| Sample size | | |
| **Information desk**<br><br>Sample size | n = 12 ; % = 66.6 | n = 7 ; % = 41.2 |
| **Permanent contract**<br><br>Sample size | n = 13 ; % = 72.2 | n = 13 ; % = 76.5 |
| **Co-operative employee**<br><br>Sample size | n = 5 ; % = 27.8 | n = 4 ; % = 23.5 |

**Outcomes**

Study timepoints

Baseline

7 month (7 months after last writing session )

**Employee outcomes**

| Outcome | Expressive writing, Baseline, N = 18 | Expressive writing, 7 month, N = 18 | No intervention , Baseline, N = 17 | No intervention , 7 month, N = 17 |
|---|---|---|---|---|
| **Mental wellbeing**<br>Ryff Psychological Well-being scales (PWS) Purpose in life subscale<br><br>Mean (SD) | 59.72 (11.43) | 64.28 (10.95) | 58.41 (10.7) | 55.94 (9.4) |

| Outcome | Expressive writing, Baseline, N = 18 | Expressive writing, 7 month, N = 18 | No intervention , Baseline, N = 17 | No intervention , 7 month, N = 17 |
|---|---|---|---|---|
| **Job stress**<br>Maslach Burnout Inventory Exhaustion (MBI - GS) Italian version<br><br>Mean (SD) | 10.72 (8.31) | 7.78 (5.15) | 11.29 (7.03) | 13.29 (6.33) |
| **Mental health symptoms**<br>Reported as Toronto Alexithymia Scale (TAS 20)<br><br>Mean (SD) | 49.67 (10.47) | 39.61 (10.76) | 49.06 (10.24) | 54.06 (9.48) |

Mental wellbeing - Polarity - Higher values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions**

**Mental wellbeing - Expressive writing vs No intervention (7 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |

| Section | Question | Answer |
|---|---|---|
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcome)* |

**Job stress - Expressive writing vs No intervention (7 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcome)* |

**Mental health symptoms - Expressive writing vs No intervention (7 month follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcome)* |

**Study arms**

**Expressive writing intervention (N = 18)**

| | |
|---|---|
| **Brief name** | Expressive writing intervention (P 793) |
| **Rationale/theory/Goal** | Pennebaker's writing technique was used with the aim of addressing burnout, psychological wellbeing and alexithymia (see below) and it was assumed that this might lead to increased productivity.<br><br>'Alexiythmia' is a construct identified by Nemiah and Sifneos,in 1973 and means 'no words for feelings". It is characterised by difficulty in<br><br>• identifying feelings<br>• distinguishing between feelings;<br>• finding words to describe feelings to others:<br>• constricted imagination<br>• preoccupation with the minute details of external events.<br>• Lack of empathy<br><br>Pennbaker's writing technique focuses on re-examination of an important life event and finding any links between the event and psychological effects . It is intended to provide a form of disclosure to give people a sense of control and to make the experience more manageable so that it gradually subsides from their conscious thoughts..<br><br>(Page 794) |
| **Materials used** | A set of instructions (Page 797) |
| **Procedures used** | The intervention group were asked to write according to a set of instructions which were read to them at the beginning of each session.<br><br>"We know that you're dealing with significant work-related changes, we would like you to write about your very deepest thoughts and feelings about work relocation. In your writing, we'd like you to really let go and explore your very deepest emotions and thoughts. You might tie this event to your childhood, your relationships with others, including parents, lovers, friends, or relatives. You may also link this event to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences on all days of writing or on different topics each day. All of your writing will be completely confidential. Don't worry about |

| | |
|---|---|
| | spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up."<br><br>(Page 797) |
| **Provider** | Instructions were read to the group by a researcher<br><br>(Page 797) |
| **Method of delivery** | Group (P 797) |
| **Setting/location of intervention** | A conference room during work time (P 797) |
| **Intensity/duration of the intervention** | 20 minutes once a week, for 3 consecutive weeks (P 797) |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Due to workers relocating it was not possible to complete the following planned steps<br><br>• Repeat the intervention for the control group<br>• Deliver a presentation of the findings to all participants (Page 798) |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

**Pennebaker's writing technique**

**No intervention (N = 17)**

| | |
|---|---|
| **Brief name** | No intervention [Abstract] |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

Control - no intervention

## D.36 Tsang, 2015

**Bibliographic Reference** Tsang, Hector W H; Cheung, W M; Chan, Alan H L; Fung, Kelvin M T; Leung, Ada Y; Au, Doreen W H; A pilot evaluation on a stress management programme using a combined approach of cognitive behavioural therapy (CBT) and complementary and alternative medicine (CAM) for elementary school teachers.; Stress and health : journal of the International Society for the Investigation of Stress; 2015; vol. 31 (no. 1); 35-43

**Study details**

| | |
|---|---|
| **Study design** | Non-randomised controlled trial (NRCT) |
| **Trial registration number** | Not reported |
| **Study start date** | Oct-2009 |
| **Study end date** | Jun-2010 |
| **Aim** | To report the efficacy and the promising aspects of the psychological, behavioural and physiological effects of the programme in helping elementary school teachers manage their stress. |
| **Country/geographical location** | Hong Kong |
| **Setting** | Workplace<br>• Public sector<br>• Education industry<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Mix of senior management, teachers and teaching assistants |

| | |
|---|---|
| **Inclusion criteria** | • qualified teaching staff (e.g. teachers and teaching assistants)<br>• have mild to severe depression, anxiety and stress symptoms as indicated by scoring at least 8 on the depression and anxiety subscales and at least 14 on the stress subscales of the Depression, Anxiety and Stress Scales. |
| **Exclusion criteria** | Not reported |
| **Method of randomisation** | Allocation based on the preference and administrative arrangements of the schools. |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • Independent t-tests and chi-squared tests were used to detect group differences in demographics at baseline and in outcome measures.<br>• Primary outcomes were scores in depression, anxiety and stress levels, with other measures considered to be secondary outcomes.<br>• The intervention effects on primary and secondary outcomes were analysed with repeated measures analysis of variance (ANOVA) or analysis of covariance (ANCOVA).<br>• Where an overall significant difference was found in specific outcome measures, a post-hoc analysis using Bonferroni correction was used.<br>• Baseline measures were treated as covariates if significant group differences existed.<br>• The missing data for participants who had dropped out at follow-ups were replaced with 'last-observation-carried-forward'.<br>• Data were analysed with Predictive Analytics Software Statistics 18 |
| **Attrition** | • In the intervention group, 10 of the 47 (21.3%) participants originally allocated were lost to follow up for the psychological measures. |

| | |
|---|---|
| | • in the control group, 8 of the 46 (17.4%) participants originally allocated were lost to follow up for the psychological measures.<br><br>(Percentages calculated by reviewer) |
| **Assessments and timepoints** | The following assessment were conducted at these timepoints<br><br>• baseline<br>• endpoint<br>• follow-up (3-4 weeks)<br><br>Primary outcome<br><br>• Depression (Depression, Anxiety and Stress Scales)<br><br>Secondary outcomes<br><br>• Sources of stress (Occupational Stress Indicator)<br>• perceived mental wellbeing (Occupational Stress Indicator)<br>• physical well-being (Occupational Stress Indicator)<br>• Job satisfaction (Occupational Stress Indicator)<br>• Teaching efficacy (Teacher's Sense of Efficacy Scale)<br>• Salivary cortisol |
| **Study limitations (author)** | • A quasi-experimental control design was used due to the administrative constraints of the schools. Future studies should use a randomised controlled trial to address the confounding variables that may affect the results.<br>• Small sample size. Future studies with larger sample sizes and longer follow-up periods will provide more evidence on the impact of the integrative stress management programme<br>• Although the intervention was grounded in the unifying theory of stress process (Cohen et al., 1995), the specific effects of the various individual components could not be ascertained by this study.<br>• Fourthly, the physiological responses of the sympathetic nervous system e.g. blood pressure, variation in heart rate and/or biofeedback were not included as outcome measures |

| | |
|---|---|
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | Quality Education Fund of the HKSAR government (reference number: 2008/0102). |

**Study arms**

CBT plus complementary and alternative medicine (CAM) (N = 47)

Stress management intervention based on combined cognitive behavioural therapy and complementary and alternative medicine

Waiting list (N = 46)

Waiting list

**Characteristics**

**Arm-level characteristics**

| **Characteristic** | **CBT plus complementary and alternative medicine (CAM) (N = 47)** | **Waiting list (N = 46)** |
|---|---|---|
| **Age**<br>Mean (SD) | 39.12 (7.79) | 37.74 (9.2) |
| **Male**<br>Sample size | n = 8 ; % = 17 | n = 7 ; % = 15 |
| **Female**<br>Sample size | n = 39 ; % = 83 | n = 39 ; % = 85 |
| **Working hours** per week<br>Mean (SD) | 62.67 (13.58) | 61.34 (10.69) |

| Characteristic | CBT plus complementary and alternative medicine (CAM) (N = 47) | Waiting list (N = 46) |
|---|---|---|
| **Vice principal**<br>Sample size | n = 0 ; % = 0 | n = 2 ; % = 4 |
| **Division head**<br>Sample size | n = 16 ; % = 35 | n = 12 ; % = 27 |
| **Teacher**<br>Sample size | n = 25 ; % = 54 | n = 28 ; % = 62 |
| **Teaching assistant**<br>Sample size | n = 5 ; % = 11 | n = 3 ; % = 7 |

**Outcomes**

**Study timepoints**

Baseline

3 week (3-4 weeks after the intervention completed)

**Employee outcomes**

| Outcome | CBT plus complementary and alternative medicine (CAM), Baseline, N = 47 | CBT plus complementary and alternative medicine (CAM), 3 week, N = 47 | Waiting list , Baseline, N = 46 | Waiting list , 3 week, N = 46 |
|---|---|---|---|---|
| **Mental wellbeing**<br>12 item sub-scale of the Occupational | 45.22 (6.91) | 42.95 (7.17) | 45.57 (6.56) | 45.78 (7.77) |

| Outcome | CBT plus complementary and alternative medicine (CAM), Baseline, N = 47 | CBT plus complementary and alternative medicine (CAM), 3 week, N = 47 | Waiting list , Baseline, N = 46 | Waiting list , 3 week, N = 46 |
|---|---|---|---|---|
| Stress Indicator (OSI) measuring contentment, resilience, peace of mind<br><br>Mean (SD) | | | | |
| **Stress**<br>21 item Depression Anxiety and Stress Scale<br><br>Mean (SD) | 22.72 (6.44) | 18.9 (8.82) | 26 (7.38) | 24.09 (9.23) |
| **Mental health symptoms**<br>21 item Depression Anxiety and Stress Scale<br><br>Mean (SD) | 14.75 (6.71) | 13.16 (8.63) | 15.35 (5.83) | 14.11 (8.01) |
| **job satisfaction**<br>6 item sub-scale of Occupational Stress Indicator (OSI)<br><br>Mean (SD) | 23.6 (4.65) | 22.65 (4.52) | 23 (4.89) | 22.41 (4.11) |

Mental wellbeing - Polarity - Higher values are better

Stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

Job satisfaction - Polarity - Higher values are better

**Critical appraisal - ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions**

**Mental wellbeing - CBT plus complementary and alternative medicine vs Waiting list (3 to 4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcomes)* |

**Job Stress - CBT plus complementary and alternative medicine vs Waiting list (3 to 4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |

| Section | Question | Answer |
|---|---|---|
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcomes)* |

**Mental health symptoms - CBT plus complementary and alternative medicine vs Waiting list (3 to 4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |

| Section | Question | Answer |
|---|---|---|
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcomes)* |

**Job satisfaction - CBT plus complementary and alternative medicine vs Waiting list (3 to 4 week follow-up)**

| Section | Question | Answer |
|---|---|---|
| 1. Bias due to confounding | Risk of bias judgement for confounding | Low |
| 2. Bias in selection of participants into the study | Risk of bias judgement for selection of participants into the study | Low |
| 3. Bias in classification of interventions | Risk of bias judgement for classification of interventions | Low |
| 4. Bias due to deviations from intended interventions | Risk of bias judgement for deviations from intended interventions | Low |
| 5. Bias due to missing data | Risk of bias judgement for missing data | Low |
| 6. Bias in measurement of outcomes | Risk of bias judgement for measurement of outcomes | Moderate<br>*(Outcome measure was self-reported)* |
| 7. Bias in selection of the reported result | Risk of bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Moderate<br>*(Self-reported outcomes)* |

**Study arms**

**CBT plus complementary and alternative medicine (N = 47)**

| | |
|---|---|
| **Brief name** | Combined cognitive behavioural therapy plus complementary and alternative medicine<br><br>(Page 35) |
| **Rationale/theory/Goal** | Work-related stress is common among teachers. This study tested the hypothesis that a stress management programme based on a combination of cognitive behavioural therapy (CBT) plus complementary and alternative medicine (CAM) would reduce stress, anxiety and depression and would indirectly improve perceptions of wellbeing, job satisfaction and teaching efficacy among elementary school teachers. Additionally it was hypothesised that there would be a reduction in the teacher's cortisol levels.<br><br>(Page 35)<br><br>The theoretical base for the programme was the unifying model of stress process (Cohen et al.,1995). This is based on the concept that people may experience stress when they believe they have inadequate coping resources compared to the demands of their environment. This self perception may lead to negative emotional responses such as anxiety and symptoms of depression.The stress management programme aims to break the fomation of stress in 2 ways: through benign appraisal of stress via CBT and then by allieviating negative emotional, physiological and behavioural responses to stress by using CAM approaches. The study aims to test the psychological, physiological and behavioural effects of the programme.<br><br>(Page 36) |
| **Materials used** | • Participants log book in which a record of their daily practice was kept<br><br>(Page 38) |
| **Procedures used** | The content of each session was as follows:<br><br>• Session 1 Lecture on stress and its health impacts. Practice of progressive muscle relaxation (tensing and relaxing different muscle groups), visualisation and diaphragm breathing,<br>• Session 2: Lecture on mind-body exercise - yoga. Practice session of yoga<br>• Session 3: Lecture on mind-body exercise - qigong.(see below) Practice session of Qigong<br>• Session 4: Lecture: on acupressure. Practice session of self-accupressure.<br>• Session 5 Lecture on self-management (focusing on a problem solving approach) and managing change. Practice session revising mind-body exercises. |

| | |
|---|---|
| | • Session 6 Lecture on cognitive behavioural therapy and aromatherapy. Practice session on mind-body exercises and class assignments.<br><br>Qigong and yoga are forms of exercise focusing on self-awareness and mind-body alignment alongside low-to-moderate exercise and non-judgemental meditation.<br><br>(Pages 37-38) |
| **Provider** | Certified instructors with backgrounds in psychology or occupational health<br><br>(Page 38-39) |
| **Method of delivery** | Group based<br><br>(Page 38) |
| **Setting/location of intervention** | Delivered in the participating school<br><br>(Page 38) |
| **Intensity/duration of the intervention** | 12 hour programme delivered over 6 sessions with each session made up of a 1 hour lecture and 1 hour of practice.<br><br>(Page 37) |
| **Tailoring/adaptation** | None reported |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

| | |
|---|---|
| **Other details** | none to add |

**Stress management intervention based on combined cognitive behavioural therapy and complementary and alternative medicine**

**Waiting list (N = 46)**

| | |
|---|---|
| **Brief name** | Waiting list<br><br>(Page 37) |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not applicable |
| **Procedures used** | Allocated to waiting list<br><br>(Page 37) |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Elemenntary schools<br><br>(Page 37) |
| **Intensity/duration of the intervention** | One school year - from August 2010 to June 2011<br><br>(Page 37) |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | None reported |

| | |
|---|---|
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | None to add |

Waiting list

## D.37 Yang, 2018

**Bibliographic Reference** Yang, Jiao; Tang, Siyuan; Zhou, Wen; Effect of mindfulness-based stress reduction therapy on work stress and mental health of psychiatric nurses.; Psychiatria Danubina; 2018; vol. 30 (no. 2); 189-196

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Study start date** | Aug-2017 |
| **Study end date** | Nov-2017 |
| **Aim** | The effect of mindfulness therapy on mental health of psychiatric nurses was examined. |
| **Country/geographical location** | Hunan province, China |
| **Setting** | Workplace |

| | |
|---|---|
| | • Public sector<br>• Healthcare industry<br>• Large organisation<br>• Contract type - Not specified<br>• Seniority - Not specified |
| **Inclusion criteria** | Participants:<br>• were psychiatric nurses<br>• were aged 20–50 years old<br>• had more than 1 year of work experience<br>• were engaged in psychiatric clinical work<br>• screened positively for more than 30 items on Symptom Checklist 90 (SCL-90) |
| **Exclusion criteria** | • Serious cardiovascular or other physical diseases |
| **Method of randomisation** | Random number table |
| **Method of allocation concealment** | Not reported |
| **Unit of allocation** | Individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • No report of a power calculation<br>• No report on missing data<br>• Cross-group comparison of two groups of means was conducted using independent samples t test,<br>• Intra-group comparison was performed using paired t-test.<br>• The qualitative data were expressed by the number of cases and constituent ratio. |

| | |
|---|---|
| | • Cross-group comparison was conducted using chi-square test or Wilcoxon rank sum test. P<0.05 was considered statistically significant. |
| **Attrition** | • 50 participants were originally randomised to both intervention and control groups<br>• In the Intervention group, 48 participants (96%) were included in the final analysis<br>• In the control group, 47 participants (94%) were included in the final analysis<br><br>(Percentages calculated by reviewer) |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Endpoint<br><br>Primary outcome was not specified<br><br>Outcomes were<br><br>• Symptom Checklist-90<br>• Self-rating depression scale (SDS)<br>• Self-rating anxiety scale (SAS)<br>• Nursing Stress Scale |
| **Study limitations (author)** | • Sampling - in future studies nurses from other departments should be included<br>• Other influencing factors need to be explored |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | Not reported |

**Study arms**

**Mindfulness-based stress reduction therapy (N = 48)**

| | |
|---|---|
| **Aim** | Mindfulness therapy consists of meditation, yoga and physical awareness, to improve self-regulation and relieve stress. In this study, mindfulness therapy was used as a stress intervention in psychiatric nurses and the effect of on their mental health was examined. |
| **Setting** | Three large general hospitals |
| **Inclusion criteria** | Participants:<br>• were psychiatric nurses<br>• were aged 20–50 years old<br>• had more than 1 year of work experience<br>• were engaged in psychiatric clinical work<br>• screened positively for more than 30 items on Symptom Checklist 90 (SCL-90) - (a 90 item checklist covering a wide range of psychotic symptomatic contents, such as thinking, emotion, behaviour, interpersonal relationships, and lifestyle habits). |
| **Method of randomisation** | By a random number table |
| **Method of allocation concealment** | Not reported<br><br>Participants were aware of the purpose of the study and to which group they were allocated. |
| **Statistical method(s) used to analyse the data** | • Cross-group comparison of two groups of means was conducted using independent samples t test,<br>• Intra-group comparison was performed using paired t-test.<br>• The qualitative data were expressed by the number of cases and constituent ratio.<br>• Cross-group comparison was conducted using chi-square test or Wilcoxon rank sum test. $P<0.05$ was considered statistically significant.<br>• The data were analyzed by SPSS 15.0 statistical software |
| **Attrition** | • 50 participants were originally randomised to both intervention and control groups<br>• In the Intervention group, 48 participants (96%) were included in the final analysis |

| | |
|---|---|
| | • In the control group, 47 participants (94%) were included in the final analysis<br><br>(Percentages calculated by reviewer) |

**Mindfulness-based stress reduction therapy**

Usual care (N = 47)

Routine psychological support and activities

**Characteristics**

**Study-level characteristics**

| **Characteristic** | **Study (N = 95)** |
|---|---|
| **Age** (years)<br><br>Mean (SD) | 29.2 (6.9) |

**Arm-level characteristics**

| **Characteristic** | **Mindfulness-based stress reduction therapy (N = 48)** | **Usual care (N = 47)** |
|---|---|---|
| **Male**<br>Percentages calculated by reviewer<br><br>Sample size | n = 16 ; % = 33.3 | n = 15 ; % = 31.9 |
| **Female**<br>Percentages calculated by reviewer<br><br>Sample size | n = 32 ; % = 66.6 | n = 32 ; % = 68.1 |

| Characteristic | Mindfulness-based stress reduction therapy (N = 48) | Usual care (N = 47) |
|---|---|---|
| **Work experience**<br>years<br><br>Mean (SD) | 8.9 (2.9) | 9.3 (3.2) |
| **Polytechnic school**<br><br>Sample size | n = 9 ; % = 18.8 | n = 8 ; % = 17 |
| **College**<br><br>Sample size | n = 15 ; % = 31.3 | n = 13 ; % = 27.7 |
| **Undergraduate and above**<br><br>Sample size | n = 24 ; % = 50 | n = 26 ; % = 55.3 |

**Outcomes**

**Study timepoints**

Baseline

0 week (Endpoint)

**Employee outcomes**

| Outcome | Mindfulness-based stress reduction therapy, Baseline, N = 50 | Mindfulness-based stress reduction therapy, 0 week, N = 50 | Usual care, Baseline, N = 50 | Usual care, 0 week, N = 50 |
|---|---|---|---|---|
| **Mental wellbeing**<br>SCL-90 - 90 item scale including thinking, emotion, behaviour | n = 48 ; % = 96 | n = 48 ; % = 96 | n = 47 ; % = 94 | n = 47 ; % = 94 |

| Outcome | Mindfulness-based stress reduction therapy, Baseline, N = 50 | Mindfulness-based stress reduction therapy, 0 week, N = 50 | Usual care, Baseline, N = 50 | Usual care, 0 week, N = 50 |
|---|---|---|---|---|
| Sample size | | | | |
| **Mental wellbeing**<br>SCL-90 - 90 item scale including thinking, emotion, behaviour<br><br>Mean (SD) | 136.7 (27.7) | 119.6 (21.6) | 134.5 (25.6) | 132.6 (24.9) |
| **Job stress**<br>Nursing stress scale (Chinese version)<br><br>Sample size | n = 48 ; % = 96 | n = 48 ; % = 96 | n = 47 ; % = 94 | n = 47 ; % = 94 |
| **Job stress**<br>Nursing stress scale (Chinese version)<br><br>Mean (SD) | 83.9 (8.3) | 68.2 (9.1) | 84.8 (8.1) | 83.1 (8.4) |
| **Mental health symptoms**<br>Self rated Depression Scale (SDS) 20 item scale<br><br>Sample size | n = 48 ; % = 96 | n = 48 ; % = 96 | n = 47 ; % = 94 | n = 47 ; % = 94 |
| **Mental health symptoms**<br>Self rated Depression Scale (SDS) 20 item scale<br><br>Mean (SD) | 45.8 (9.1) | 35.4 (8.3) | 43.3 (7.9) | 41.2 (8.7) |

Mental wellbeing - Polarity - Lower values are better

Job stress - Polarity - Lower values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Mental wellbeing- Mindfulness-based stress reduction therapy vs Usual care**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome were self-reported)* |

**Mental health symptoms - Mindfulness-based stress reduction therapy vs Usual care**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Outcome measure were self-reported)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Outcome was self-reported)* |

**Study arms**

**Mindfulness-based stress reduction therapy (N = 50**)

| | |
|---|---|
| **Brief name** | Mindfulness-based stress reduction therapy (P 189) |
| **Rationale/theory/Goal** | Mindfulness therapy  consists of meditation, yoga and physical awareness, to improve self-regulation and relieve stress. (P 190) |
| **Materials used** | Access to relaxing Chinese music (P 190) |
| **Procedures used** | Nurses were met at the nursing station and selected the training according to the amount of spare time they had. |

| | |
|---|---|
| | Each session followed three stages:<br><br>• "Relaxation preparation - The nurses selected a comfortable resting position and were encouraged to relax to Chinese music; The operator then guided the nurses to focus on all parts of the body in turn from foot to head in turn<br>• Mindfulness breathing through which uncomfortable feelings were acknowledged and addressed<br>• Mindfulness meditation in which the nurses were taught to recognise their thoughts and emotions and how to respond to negative thoughts and emotions. (P 190) |
| **Provider** | Not clear |
| **Method of delivery** | Nurses could either participate in the training sessions or practice at home (P 190) |
| **Setting/location of intervention** | Workplace / Home (P 190) |
| **Intensity/duration of the intervention** | Weekly for 8 weeks. Duration of the sessions is not reported (P 190) |
| **Tailoring/adaptation** | The nurses could either participate in the sessions or practice at home (P 190) |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**Mindfulness-based stress reduction therapy**

Routine psychological support and activities (N = 50)

| | |
|---|---|
| **Brief name** | Routine psychological support and activities |
| **Rationale/theory/Goal** | Not reported |
| **Materials used** | Not reported |
| **Procedures used** | Not reported |
| **Provider** | Not reported |
| **Method of delivery** | Not reported |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | Not reported |
| **Tailoring/adaptation** | Not reported |
| **Unforeseen modifications** | Not reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |

| | |
|---|---|
| **Other details** | None to add |

Routine psychological support and activities

## D.38 Zolnierczyk-Zreda, 2016

**Bibliographic Reference** Zolnierczyk-Zreda, D; Sanderson, M; Bedynska, S; Mindfulness-based stress reduction for managers: A randomized controlled study.; Occupational Medicine; 2016; vol. 66 (no. 8); 630-635

**Study details**

| | |
|---|---|
| **Study design** | Randomised controlled trial (RCT) |
| **Trial registration number** | Not reported |
| **Aim** | To examine whether Mindfulness based stress reduction (MBSR) can decrease stress and its negative effects on middle managers' well-being, self-esteem and physical complaints<br><br>to test the effectiveness of MBSR in decreasing levels of sickness absence for managers at organisational level. |
| **Country/geographical location** | Poland |
| **Setting** | Workplace<br><br>• Private<br>• Sector - Mix of financial and service sector companies including banking, advertising and insurance companies.<br>• Size - Not specified<br>• Contract type - Not specified<br>• Seniority - Middle-manager |

| | |
|---|---|
| **Inclusion criteria** | • Employed as a middle manager currently,<br>• Over 26 years of age<br>• Had been in the same job for at least 2 years<br>• Responded to the question 'How often do you feel stressed?' with a frequency of at least 'regularly'<br>• Agreed to participate in the whole programme |
| **Exclusion criteria** | • Serious mental or physical health conditions , e.g. depression, other psychiatric disorders or cognitive impairment, which would interfere with participation in the training or assessment,<br>• Alcoholism or other substance abuse<br>• Previous MBSR training |
| **Method of randomisation** | Not reported |
| **Method of allocation concealment** | Sealed envelopes were used and performed prior to pre-test assessment |
| **Unit of allocation** | individual |
| **Unit of analysis** | Individual |
| **Statistical method(s) used to analyse the data** | • No power calculation reported<br>• To check for significant differences between groups chi-squared test for used for gender and an independent sample t-test was used for age.<br>• Independent sample t-test was also used for 4 dependent variables: work-related stress, positive and negative affect, self-esteem, somatic complaints and sickness absence,<br>• Differences at the $P < 0.05$ level were considered significant.<br>• To test the effects of the intervention, a series of multivariate repeated-measures analysis of covariance (MANCOVA) in SPSS for Windows 15.0 was used.<br>• Additionally Cohen's d was used as effect size measure |

| | |
|---|---|
| **Attrition** | • 6 of the 78 (7.7%) in the intervention group and 6 of the 78 (7.7%) in the control group dropped out of the study |
| **Assessments and timepoints** | The following assessments were made at these timepoints<br><br>• Baseline<br>• Follow-up - 3 months from baseline (4 weeks from last session)<br><br>Primary outcome was not specified<br><br>Outcomes were<br><br>• Occupational Stress Indicator (OSI-2)<br>• Affect Experience Index (AEI)<br>• Rosenberg Self-Esteem Scale (RSES)<br>• Health Questionnaire |
| **Study limitations (author)** | • Short term follow up - Authors note future research should include follow up of more than 1 year. |
| **Study limitations (reviewer)** | None to add |
| **Source of funding** | The Polish Central Institute for Labour Protection-National Research Institute (CIOP-PIB). |

**Study arms**

Mindfulness-based stress reduction (N = 78)

Mindfulness based stress reduction

Waiting list (N = 78)

Waiting list

**Characteristics**

**Study-level characteristics**

| Characteristic | Study (N = 144) |
|---|---|
| **Age**<br>reported for completer's only<br><br>Mean (SD) | 39.4 (8.4) |
| **Male**<br><br>Sample size | n = 73 ; % = 50 |
| **Female**<br><br>Sample size | n = 71 ; % = 49 |
| **Higher educational qualification**<br><br>Sample size | n = 144 ; % = 100 |
| **Job tenure**<br>years<br><br>Mean (SD) | 6.2 (2.5) |

**Outcomes**

**Study timepoints**

Baseline

4 week (3 months from baseline - intervention = 8 weeks + 1 follow-up session)

**Employee outcomes**

| Outcome | Mindfulness-based stress reduction , Baseline, N = 78 | Mindfulness-based stress reduction , 4 week, N = 78 | Waiting list , Baseline, N = 78 | Waiting list , 4 week, N = 78 |
|---|---|---|---|---|
| **Job stress**<br>Occupational Stress Indicator (OSI) 40 item scale<br><br>Sample size | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 |
| **Job stress**<br>Occupational Stress Indicator (OSI) 40 item scale<br><br>Mean (SE) | 139 (4.35) | 126 (4.1) | 126.7 (4.35) | 125.7 (4.31) |
| **absenteeism**<br>Days absence in past 3 months<br><br>Sample size | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 |
| **absenteeism**<br>Days absence in past 3 months<br><br>Mean (SE) | 5.47 (0.34) | 1.4 (0.33) | 3.84 (0.34) | 3.69 (0.33) |
| **Mental wellbeing**<br>Rosenberg's Self esteem Scale (Polish version)<br><br>Sample size | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 |
| **Mental wellbeing**<br>Rosenberg's Self esteem Scale (Polish version)<br><br>Mean (SE) | 9.52 (0.2) | 11 (0.2) | 9.81 (0.2) | 10 (0.2) |

| Outcome | Mindfulness-based stress reduction , Baseline, N = 78 | Mindfulness-based stress reduction , 4 week, N = 78 | Waiting list , Baseline, N = 78 | Waiting list , 4 week, N = 78 |
|---|---|---|---|---|
| **Mental health symptoms** Reported as Affect Experience Index - Negative affect<br><br>Sample size | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 | n = 72 ; % = 92 |
| **Mental health symptoms** Reported as Affect Experience Index - Negative affect<br><br>Mean (SE) | 7.65 (0.18) | 6.42 (0.17) | 7.2 (0.18) | 7.19 (0.17) |

Job stress - Polarity - Lower values are better

absenteeism - Polarity - Lower values are better

Mental wellbeing - Polarity - Higher values are better

Mental health symptoms - Polarity - Lower values are better

**Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) RCT**

**Job stress - Mindfulness-based stress reduction vs Waiting list (4 weeks after the intervention)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |

| Section | Question | Answer |
|---|---|---|
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Self-report outcome)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-report outcome)* |

**Absenteeism - Mindfulness-based stress reduction vs Waiting list (4 weeks after the intervention)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Self-report outcome)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |

| Section | Question | Answer |
|---|---|---|
| Overall bias | Risk of bias judgement | Some concerns *(Self-report outcome)* |

**Mental wellbeing - Mindfulness-based stress reduction - Waiting list (4 weeks after the intervention)**

| Section | Question | Answer |
|---|---|---|
| Domain 1: Bias arising from the randomisation process | Risk of bias judgement for the randomisation process | Low |
| Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention) | Risk of bias for deviations from the intended interventions (effect of assignment to intervention) | Low |
| Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention) | Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention) | Low |
| Domain 3. Bias due to missing outcome data | Risk-of-bias judgement for missing outcome data | Low |
| Domain 4. Bias in measurement of the outcome | Risk-of-bias judgement for measurement of the outcome | Some concerns *(Self-report outcome)* |
| Domain 5. Bias in selection of the reported result | Risk-of-bias judgement for selection of the reported result | Low |
| Overall bias | Risk of bias judgement | Some concerns *(Self-report outcome)* |

**Study arms**

**Mindfulness-based stress reduction (N = 78)**

| | |
|---|---|
| **Brief name** | Mindfulness-based stress reduction (MBSR) for managers (P 632] |

| | |
|---|---|
| **Rationale/theory/Goal** | Based on the rationale that mindfulness enhances psychological and behavioural functioning are assumed to be related to self-regulatory processes such as regulation of attention and mood repair, as well as working memory and other cognitive capabilities, within relatively short periods of time. (P 631) |
| **Materials used** | • Audio recordings set given to participants for homework practice |
| **Procedures used** | The 8 weekly sessions consisted of the following:<br><br>• Detailed spoken instructions were given<br>• Sitting meditation which focused in turn on: breathing; the body as a whole; sensations, thoughts, and emotions, and to whatever is currently arising in awareness;<br>• Body scanning, consisting of awareness from toes to the head and any arising feelings<br>• Mindful bodywork ie. hatha yoga postures<br>• Enquiry process - which participants were asked to express their experiences of the exercises, and to reflect, non-judgementally on them, and on the fact they had arisen.<br>• Daily homework consisting of guided meditations provided through audiotapes ( 632) |
| **Provider** | Trainers who had undergone training directed by Kabat Zinn on whose work the intervention was modelled.<br><br>(Page 631) |
| **Method of delivery** | Group sessions training sessions? plusone individual follow up session with the trainer.<br><br>(Page 631) |
| **Setting/location of intervention** | Not reported |
| **Intensity/duration of the intervention** | • 8 x weekly 3 hour training sessions<br>• 1 full day (7 hour session) delivered towards the end of the course<br>• An individual follow up session with the trainer for each participant<br>• 20 minutes homework on 6 days of each week<br><br>(Page 631) |

| | |
|---|---|
| **Tailoring/adaptation** | None reported |
| **Unforeseen modifications** | None reported |
| **Planned treatment fidelity** | Not reported |
| **Actual treatment fidelity** | Not reported |
| **Other details** | None to add |

**Mindfulness-based stress reduction**

Waiting list (N = 78)

| | |
|---|---|
| **Brief name** | Waiting list |
| **Rationale/theory/Goal** | Not applicable |
| **Materials used** | Not applicable |
| **Procedures used** | Not applicable |
| **Provider** | Not applicable |
| **Method of delivery** | Not applicable |
| **Setting/location of intervention** | Not applicable |

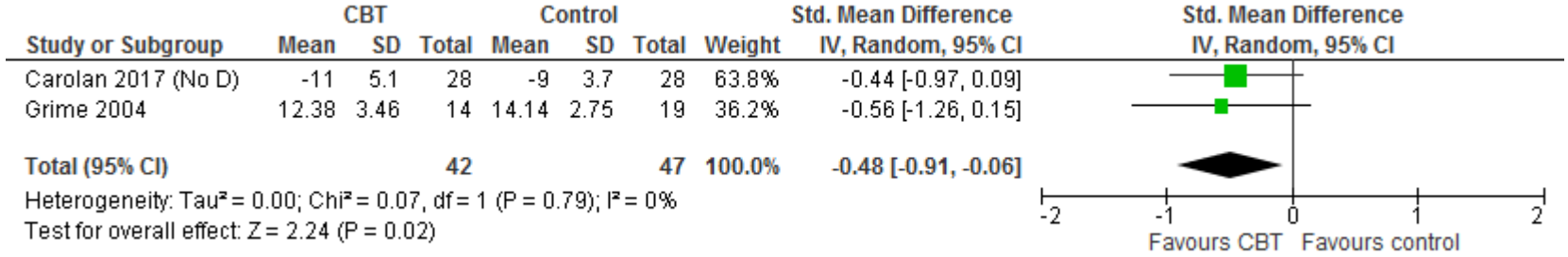
| | |
|---|---|
| **Intensity/duration of the intervention** | Not applicable |
| **Tailoring/adaptation** | Not applicable |
| **Unforeseen modifications** | Not applicable |
| **Planned treatment fidelity** | Not applicable |
| **Actual treatment fidelity** | Not applicable |
| **Other details** | The control group received the same intervention as the experimental group once the intervention had completed<br><br>(Page 631) |

Waiting list

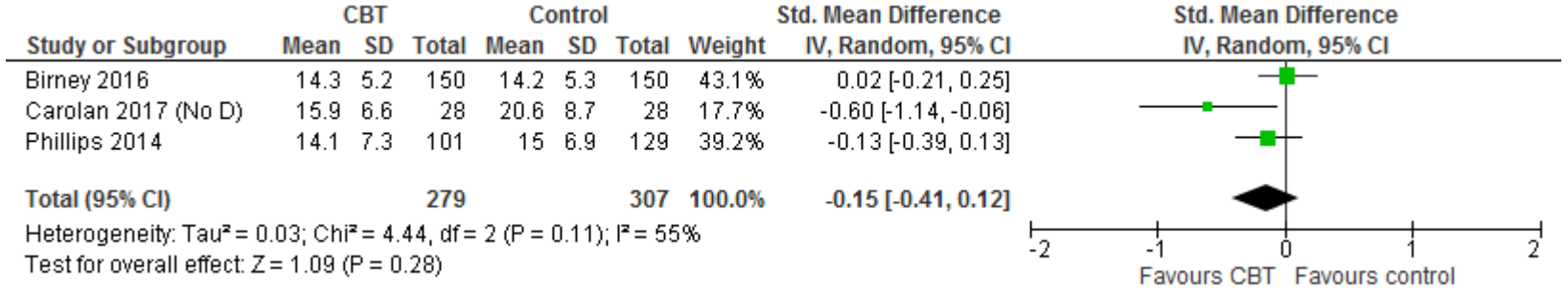
# Appendix E – Forest plots

## E.1 Cognitive behaviour therapy

### E.1.1 Mental wellbeing



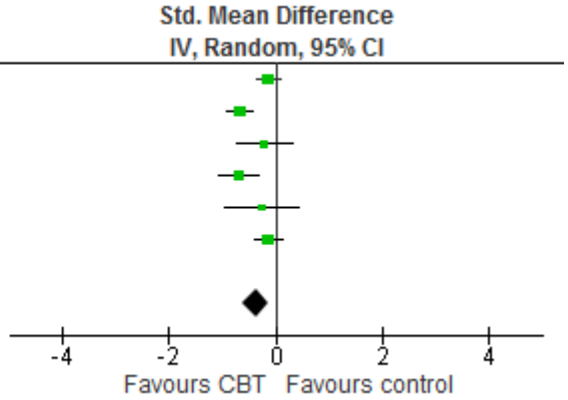

### E.1.2 Job stress



### E.1.3 Mental health symptoms

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Birney 2016 | 8.8 | 5.1 | 150 | 9.5 | 5 | 150 | 21.8% | -0.14 [-0.36, 0.09] |
| Bostock 2016 | -6.44 | 1.859 | 135 | -5.24 | 1.7428 | 135 | 21.1% | -0.66 [-0.91, -0.42] |
| Carolan 2017 (No D) | 13.8 | 9.5 | 28 | 16 | 9.9 | 28 | 11.9% | -0.22 [-0.75, 0.30] |
| Furukawa 2012 | 11 | 6.8458 | 58 | 15.7 | 6.5808 | 60 | 16.5% | -0.70 [-1.07, -0.32] |
| Grime 2004 | 5.07 | 4.57 | 14 | 6.21 | 4.22 | 19 | 8.4% | -0.25 [-0.95, 0.44] |
| Phillips 2014 | 9.3 | 6.9 | 97 | 10.3 | 6.9 | 122 | 20.3% | -0.14 [-0.41, 0.12] |
| **Total (95% CI)** | | | **482** | | | **514** | **100.0%** | **-0.36 [-0.60, -0.12]** |

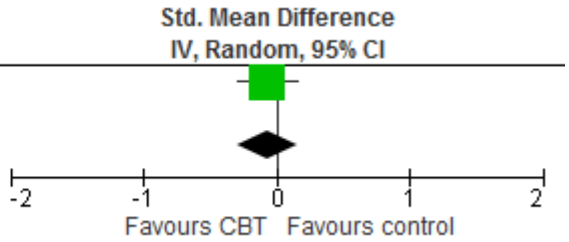
Heterogeneity: Tau² = 0.06; Chi² = 15.55, df = 5 (P = 0.008); I² = 68%
Test for overall effect: Z = 2.93 (P = 0.003)




### E.1.4 Productivity

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Birney 2016 | 8.6 | 5.3 | 150 | 9 | 5.5 | 150 | 100.0% | -0.07 [-0.30, 0.15] |
| **Total (95% CI)** | | | **150** | | | **150** | **100.0%** | **-0.07 [-0.30, 0.15]** |

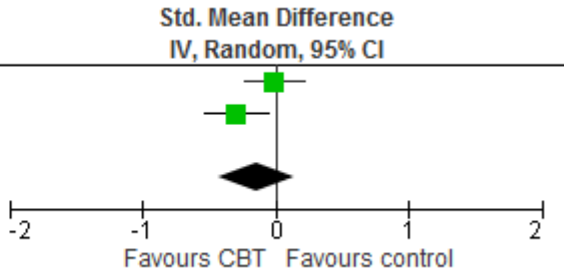
Heterogeneity: Not applicable
Test for overall effect: Z = 0.64 (P = 0.52)

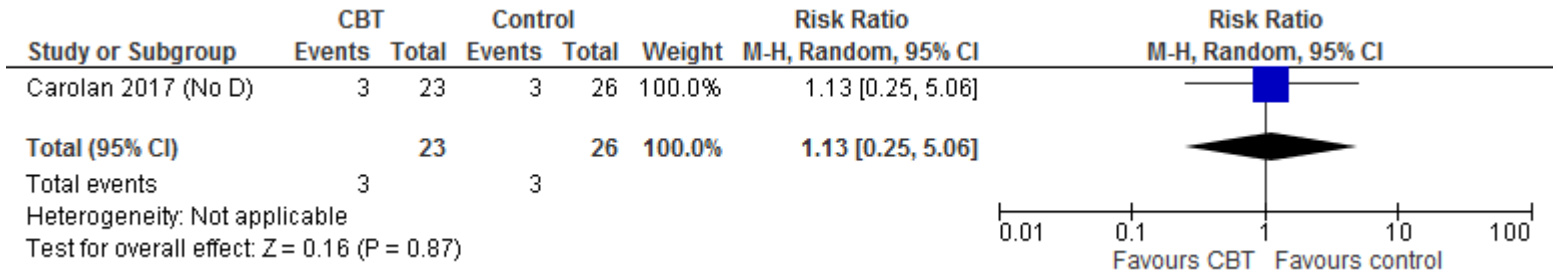



### E.1.5 Absenteeism

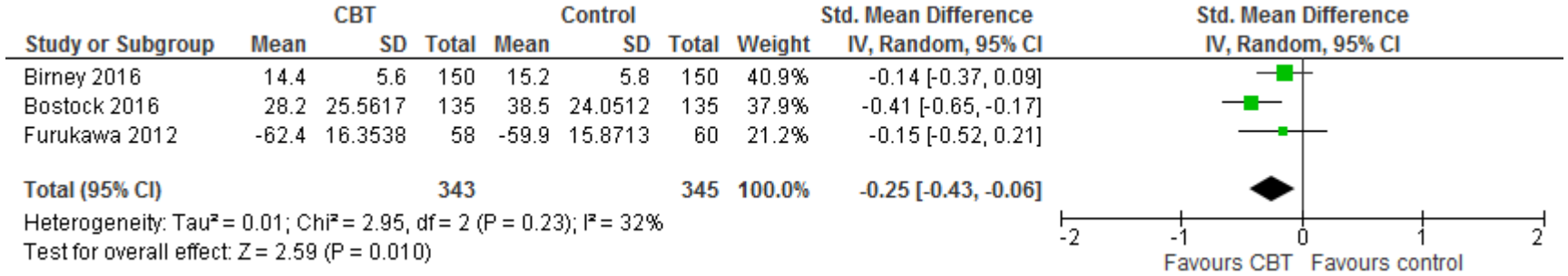
| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Birney 2016 | 21.7 | 40 | 150 | 21.9 | 40.3 | 150 | 51.0% | -0.00 [-0.23, 0.22] |
| Bostock 2016 | 2.06 | 5.5771 | 135 | 3.93 | 6.9714 | 135 | 49.0% | -0.30 [-0.54, -0.06] |
| **Total (95% CI)** | | | **285** | | | **285** | **100.0%** | **-0.15 [-0.43, 0.14]** |

Heterogeneity: Tau² = 0.03; Chi² = 2.98, df = 1 (P = 0.08); I² = 66%
Test for overall effect: Z = 1.01 (P = 0.31)

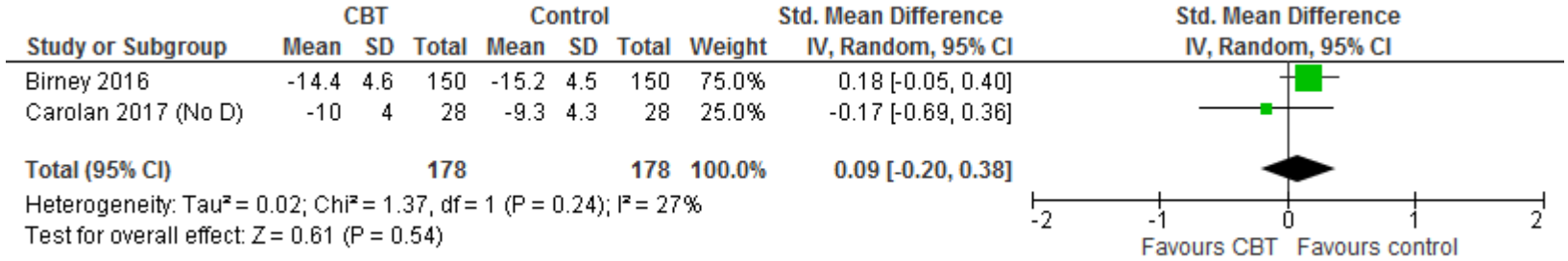





## E.1.6 Presenteeism



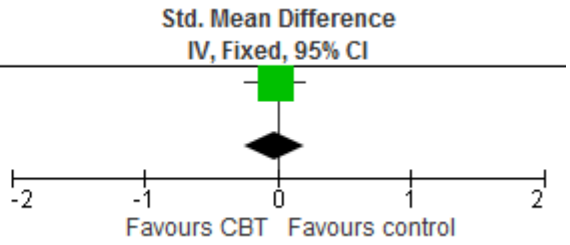

## E.1.7 Job satisfaction



### E.1.8 Mental health literacy

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Birney 2016 | -63.3 | 18.9 | 150 | -63 | 16.6 | 150 | 100.0% | -0.02 [-0.24, 0.21] |
| **Total (95% CI)** | | | **150** | | | **150** | **100.0%** | **-0.02 [-0.24, 0.21]** |

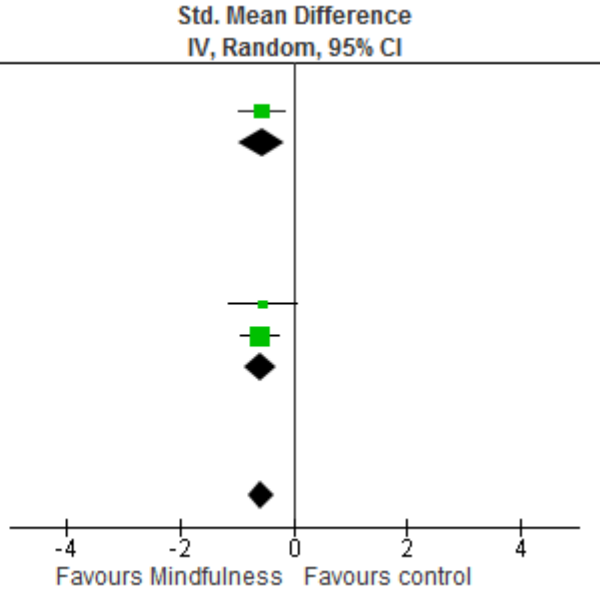
Heterogeneity: Not applicable
Test for overall effect: Z = 0.15 (P = 0.88)




## E.2 Mindfulness

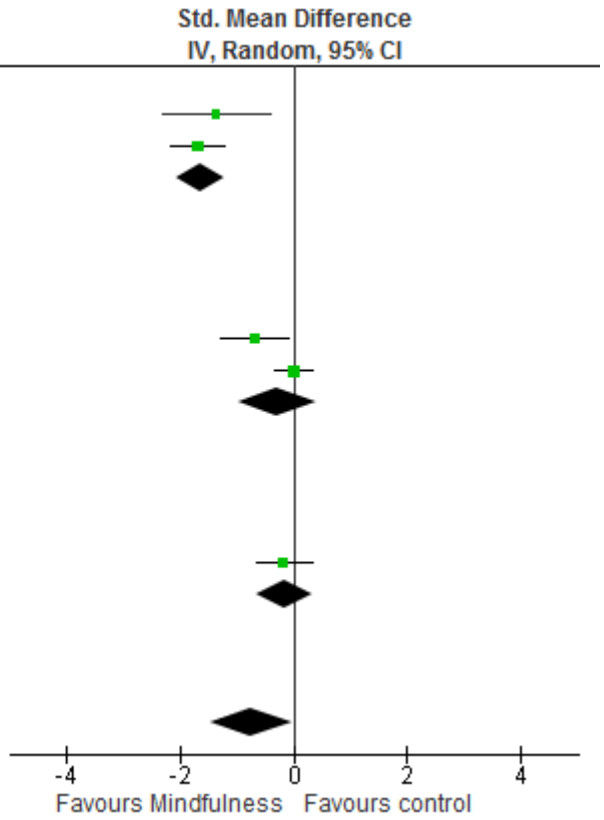
### E.2.1 Mental wellbeing

| Study or Subgroup | Mindfulness Mean | Mindfulness SD | Mindfulness Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| **2.1.1 HCP** | | | | | | | | |
| Yang 2018 | 119.6 | 21.6 | 48 | 132.6 | 24.9 | 47 | 33.6% | -0.55 [-0.96, -0.14] |
| **Subtotal (95% CI)** | | | **48** | | | **47** | **33.6%** | **-0.55 [-0.96, -0.14]** |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect: Z = 2.65 (P = 0.008) | | | | | | | | |
| **2.1.2 Non-HCP** | | | | | | | | |
| Lacerda 2018 | -65.08 | 15.15 | 22 | -57.25 | 13.6022 | 22 | 15.6% | -0.53 [-1.14, 0.07] |
| Zolnierczyk-Zreda 2016 | -11 | 1.6971 | 72 | -10 | 1.6971 | 72 | 50.8% | -0.59 [-0.92, -0.25] |
| **Subtotal (95% CI)** | | | **94** | | | **94** | **66.4%** | **-0.57 [-0.87, -0.28]** |
| Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 1 (P = 0.88); I² = 0% | | | | | | | | |
| Test for overall effect: Z = 3.85 (P = 0.0001) | | | | | | | | |
| **Total (95% CI)** | | | **142** | | | **141** | **100.0%** | **-0.57 [-0.80, -0.33]** |
| Heterogeneity: Tau² = 0.00; Chi² = 0.03, df = 2 (P = 0.99); I² = 0% | | | | | | | | |
| Test for overall effect: Z = 4.67 (P < 0.00001) | | | | | | | | |
| Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.94), I² = 0% | | | | | | | | |



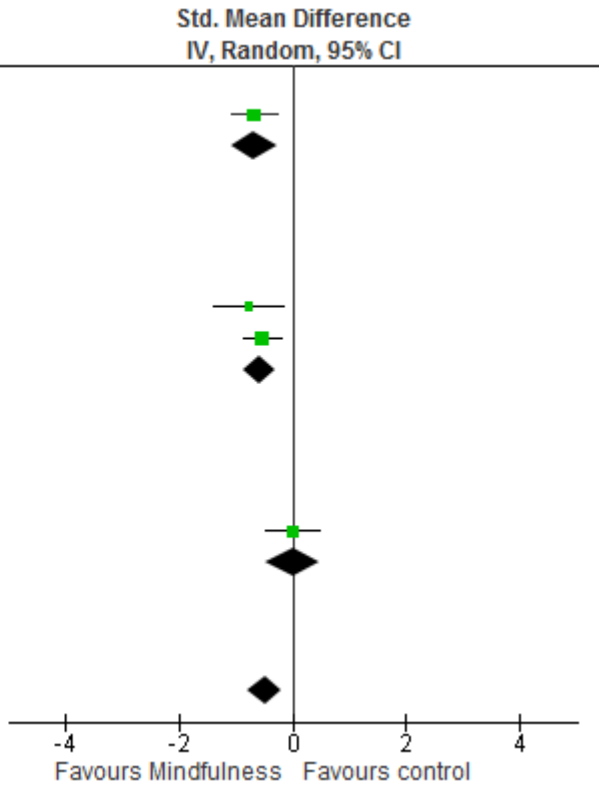
### E.2.2 Job stress

| Study or Subgroup | Mindfulness Mean | Mindfulness SD | Mindfulness Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| **2.2.1 HCP** | | | | | | | | |
| Kim 2013 | 24.3 | 3.3 | 11 | 41 | 16.3 | 11 | 16.4% | -1.37 [-2.31, -0.42] |
| Yang 2018 | 68.2 | 9.1 | 48 | 83.1 | 8.4 | 47 | 21.0% | -1.69 [-2.16, -1.22] |
| **Subtotal (95% CI)** | | | **59** | | | **58** | **37.4%** | **-1.62 [-2.05, -1.20]** |
| Heterogeneity: Tau² = 0.00; Chi² = 0.35, df = 1 (P = 0.55); I² = 0% | | | | | | | | |
| Test for overall effect: Z = 7.55 (P < 0.00001) | | | | | | | | |
| **2.2.2 Non-HCP** | | | | | | | | |
| Lacerda 2018 | 2.24 | 2.8612 | 22 | 4.16 | 2.5797 | 22 | 19.8% | -0.69 [-1.30, -0.08] |
| Zolnierczyk-Zreda 2016 | 126 | 34.7897 | 72 | 125.7 | 34.7897 | 72 | 22.0% | 0.01 [-0.32, 0.34] |
| **Subtotal (95% CI)** | | | **94** | | | **94** | **41.8%** | **-0.29 [-0.97, 0.39]** |
| Heterogeneity: Tau² = 0.18; Chi² = 3.94, df = 1 (P = 0.05); I² = 75% | | | | | | | | |
| Test for overall effect: Z = 0.84 (P = 0.40) | | | | | | | | |
| **2.2.3 Not specified** | | | | | | | | |
| Diaz-Silveira 2020 | 0.52 | 0.17 | 30 | 0.55 | 0.17 | 34 | 20.8% | -0.17 [-0.67, 0.32] |
| **Subtotal (95% CI)** | | | **30** | | | **34** | **20.8%** | **-0.17 [-0.67, 0.32]** |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect: Z = 0.69 (P = 0.49) | | | | | | | | |
| **Total (95% CI)** | | | **183** | | | **186** | **100.0%** | **-0.75 [-1.47, -0.03]** |
| Heterogeneity: Tau² = 0.58; Chi² = 38.90, df = 4 (P < 0.00001); I² = 90% | | | | | | | | |
| Test for overall effect: Z = 2.05 (P = 0.04) | | | | | | | | |
| Test for subgroup differences: Chi² = 22.71, df = 2 (P < 0.0001), I² = 91.2% | | | | | | | | |



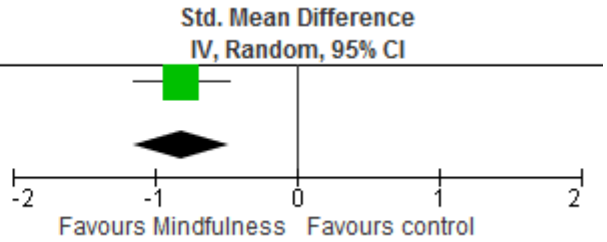
### E.2.3 Mental health symptoms

| Study or Subgroup | Mindfulness Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| **2.3.1 HCP** | | | | | | | | |
| Yang 2018 | 35.4 | 8.3 | 48 | 41.2 | 8.7 | 47 | 27.3% | -0.68 [-1.09, -0.26] |
| **Subtotal (95% CI)** | | | **48** | | | **47** | **27.3%** | **-0.68 [-1.09, -0.26]** |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect: Z = 3.20 (P = 0.001) | | | | | | | | |
| **2.3.2 Non-HCP** | | | | | | | | |
| Lacerda 2018 | 6.24 | 5.6285 | 22 | 10.38 | 5.0187 | 22 | 16.8% | -0.76 [-1.38, -0.15] |
| Zolnierczyk-Zreda 2016 | 6.42 | 1.4425 | 72 | 7.19 | 1.4425 | 72 | 33.4% | -0.53 [-0.86, -0.20] |
| **Subtotal (95% CI)** | | | **94** | | | **94** | **50.2%** | **-0.58 [-0.88, -0.29]** |
| Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.42$, df = 1 (P = 0.52); $I^2 = 0\%$ | | | | | | | | |
| Test for overall effect: Z = 3.91 (P < 0.0001) | | | | | | | | |
| **2.3.3 Not specified** | | | | | | | | |
| Diaz-Silveira 2020 | 12.89 | 6.66 | 30 | 12.89 | 4.86 | 34 | 22.5% | 0.00 [-0.49, 0.49] |
| **Subtotal (95% CI)** | | | **30** | | | **34** | **22.5%** | **0.00 [-0.49, 0.49]** |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect: Z = 0.00 (P = 1.00) | | | | | | | | |
| **Total (95% CI)** | | | **172** | | | **175** | **100.0%** | **-0.49 [-0.79, -0.19]** |
| Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 5.42$, df = 3 (P = 0.14); $I^2 = 45\%$ | | | | | | | | |
| Test for overall effect: Z = 3.20 (P = 0.001) | | | | | | | | |
| Test for subgroup differences: $Chi^2 = 5.00$, df = 2 (P = 0.08), $I^2 = 60.0\%$ | | | | | | | | |




### E.2.4 Absenteeism

| Study or Subgroup | Mindfulness Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Zolnierczyk-Zreda 2016 | 1.4 | 2.8001 | 72 | 3.69 | 2.8001 | 72 | 100.0% | -0.81 [-1.15, -0.47] |
| **Total (95% CI)** | | | **72** | | | **72** | **100.0%** | **-0.81 [-1.15, -0.47]** |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect: Z = 4.69 (P < 0.00001) | | | | | | | | |

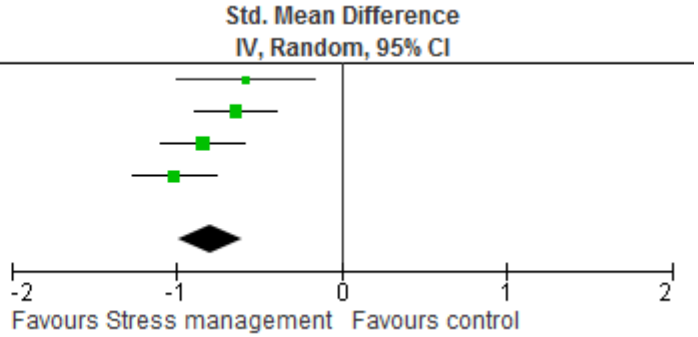


# E.3 Stress management

## E.3.1 Job stress

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Clemow 2018 | -2.5 | 9.6 | 46 | 3.12 | 9.7 | 46 | 15.2% | -0.58 [-0.99, -0.16] |
| Ebert 2016a | 17.5 | 6.7 | 131 | 21.8 | 6.7 | 132 | 28.7% | -0.64 [-0.89, -0.39] |
| Ebert 2016b | 17.05 | 5.81 | 132 | 22.24 | 6.46 | 132 | 28.3% | -0.84 [-1.09, -0.59] |
| Heber 2016 | 16.08 | 6.03 | 132 | 22.1 | 5.81 | 132 | 27.8% | -1.01 [-1.27, -0.76] |
| **Total (95% CI)** | | | **441** | | | **442** | **100.0%** | **-0.79 [-0.98, -0.60]** |

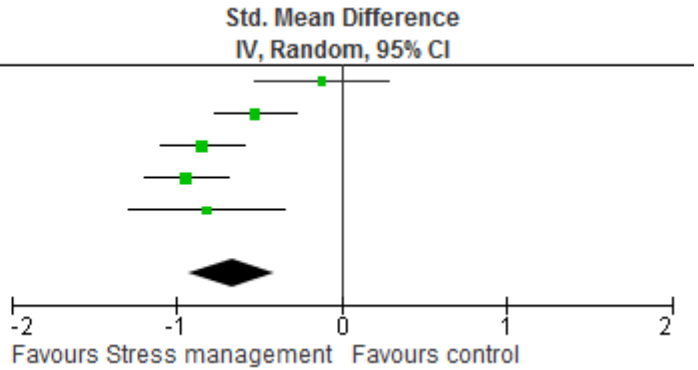
Heterogeneity: Tau² = 0.02; Chi² = 5.47, df = 3 (P = 0.14); I² = 45%
Test for overall effect: Z = 8.15 (P < 0.00001)




## E.3.2 Mental health symptoms

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Clemow 2018 | 0.1 | 8.9 | 46 | 1 | 5.9 | 46 | 16.9% | -0.12 [-0.53, 0.29] |
| Ebert 2016a | 15.2 | 9 | 131 | 20.2 | 10 | 132 | 22.9% | -0.52 [-0.77, -0.28] |
| Ebert 2016b | 15.52 | 7.05 | 132 | 22.75 | 9.78 | 132 | 22.7% | -0.85 [-1.10, -0.59] |
| Heber 2016 | 13.83 | 7.71 | 132 | 21.49 | 8.48 | 132 | 22.6% | -0.94 [-1.20, -0.69] |
| Jones 2000 | 47.6 | 12.4 | 38 | 58.2 | 13.3 | 38 | 15.0% | -0.82 [-1.28, -0.35] |
| **Total (95% CI)** | | | **479** | | | **480** | **100.0%** | **-0.67 [-0.93, -0.40]** |

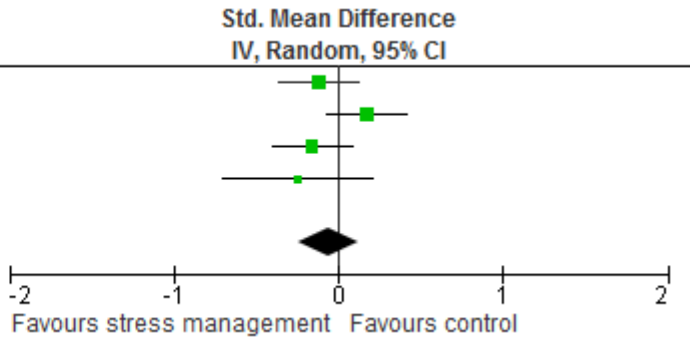
Heterogeneity: Tau² = 0.06; Chi² = 14.74, df = 4 (P = 0.005); I² = 73%
Test for overall effect: Z = 4.96 (P < 0.00001)



### E.3.3 Absenteeism

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2016a | 3.6 | 9.1 | 131 | 4.9 | 12 | 132 | 29.1% | -0.12 [-0.36, 0.12] |
| Ebert 2016b | 7.37 | 14.71 | 132 | 5.17 | 10.52 | 132 | 29.1% | 0.17 [-0.07, 0.41] |
| Heber 2016 | 3.64 | 6.7 | 132 | 5.23 | 12.1 | 132 | 29.1% | -0.16 [-0.40, 0.08] |
| Jones 2000 | 2.6 | 3.1 | 38 | 3.9 | 6.6 | 38 | 12.6% | -0.25 [-0.70, 0.20] |
| **Total (95% CI)** | | | **433** | | | **434** | **100.0%** | **-0.06 [-0.24, 0.12]** |

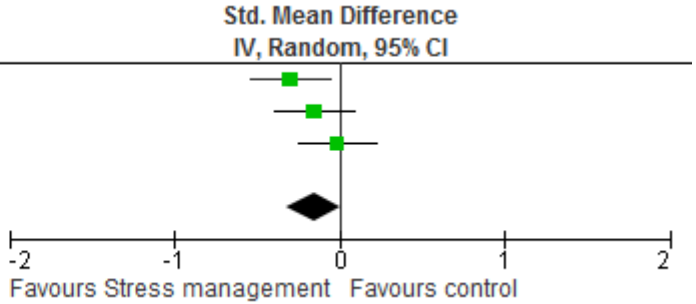
Heterogeneity: Tau² = 0.01; Chi² = 5.13, df = 3 (P = 0.16); I² = 42%
Test for overall effect: Z = 0.70 (P = 0.49)




### E.3.4 Presenteeism

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2016a | 7.2 | 9.6 | 131 | 10.5 | 12.2 | 132 | 33.1% | -0.30 [-0.54, -0.06] |
| Ebert 2016b | 10.31 | 9.85 | 132 | 12.02 | 11.93 | 132 | 33.4% | -0.16 [-0.40, 0.09] |
| Heber 2016 | 11.32 | 12.88 | 132 | 11.47 | 11.93 | 132 | 33.5% | -0.01 [-0.25, 0.23] |
| **Total (95% CI)** | | | **395** | | | **396** | **100.0%** | **-0.16 [-0.32, 0.01]** |

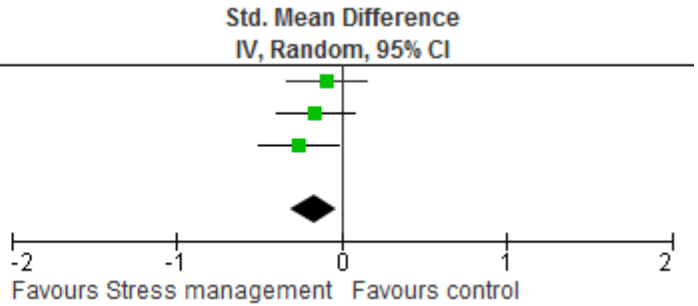
Heterogeneity: Tau² = 0.01; Chi² = 2.71, df = 2 (P = 0.26); I² = 26%
Test for overall effect: Z = 1.87 (P = 0.06)




### E.3.5 Job satisfaction

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2016a | -3.2 | 1.1 | 131 | -3.1 | 1.2 | 132 | 33.4% | -0.09 [-0.33, 0.16] |
| Ebert 2016b | -3.41 | 1.24 | 132 | -3.21 | 1.3 | 132 | 33.4% | -0.16 [-0.40, 0.08] |
| Heber 2016 | -3.46 | 1.17 | 132 | -3.16 | 1.14 | 132 | 33.2% | -0.26 [-0.50, -0.02] |
| **Total (95% CI)** | | | **395** | | | **396** | **100.0%** | **-0.17 [-0.31, -0.03]** |

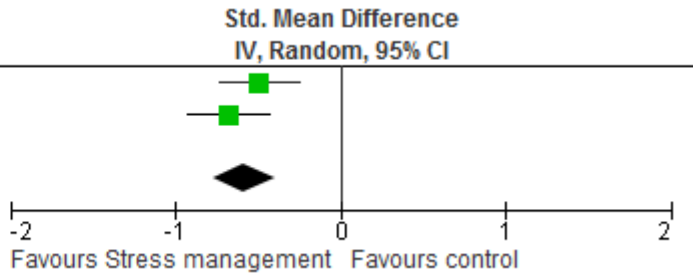
Heterogeneity: Tau² = 0.00; Chi² = 0.98, df = 2 (P = 0.61); I² = 0%
Test for overall effect: Z = 2.35 (P = 0.02)



### E.3.6 Quality of life

| Study or Subgroup | Stress management Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2016a | -43.2 | 9.9 | 131 | -38.3 | 10.1 | 132 | 50.5% | -0.49 [-0.73, -0.24] |
| Heber 2016 | -43.38 | 10.56 | 132 | -36.54 | 9.5 | 132 | 49.5% | -0.68 [-0.93, -0.43] |
| **Total (95% CI)** | | | **263** | | | **264** | **100.0%** | **-0.58 [-0.77, -0.40]** |

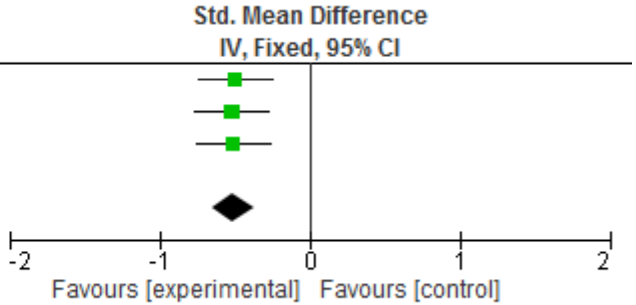
Heterogeneity: Tau² = 0.00; Chi² = 1.14, df = 1 (P = 0.28); I² = 13%
Test for overall effect: Z = 6.12 (P < 0.00001)




### E.3.7 Mental health literacy

| Study or Subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2016a | -3 | 0.7 | 131 | -2.6 | 0.9 | 132 | 33.3% | -0.49 [-0.74, -0.25] |
| Ebert 2016b | -3.1 | 0.66 | 132 | -2.71 | 0.83 | 132 | 33.3% | -0.52 [-0.76, -0.27] |
| Heber 2016 | -3.15 | 0.64 | 132 | -2.78 | 0.8 | 132 | 33.4% | -0.51 [-0.75, -0.26] |
| **Total (95% CI)** | | | **395** | | | **396** | **100.0%** | **-0.51 [-0.65, -0.37]** |

Heterogeneity: Chi² = 0.02, df = 2 (P = 0.99); I² = 0%
Test for overall effect: Z = 7.02 (P < 0.00001)

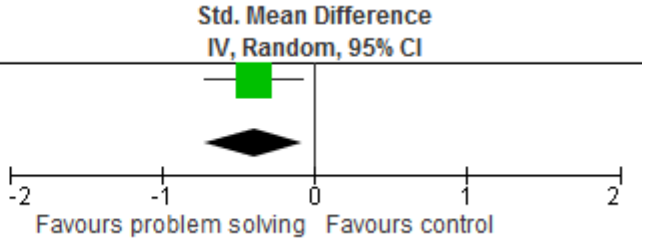



## E.4 Problem-solving

### E.4.1 Job stress

| Study or Subgroup | Problem solving Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2014 | 0.53 | 0.19 | 75 | 0.6 | 0.16 | 75 | 100.0% | -0.40 [-0.72, -0.07] |
| **Total (95% CI)** | | | **75** | | | **75** | **100.0%** | **-0.40 [-0.72, -0.07]** |

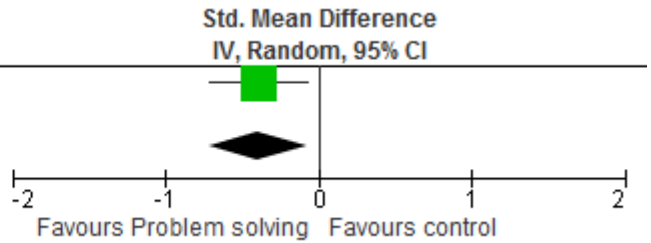
Heterogeneity: Not applicable
Test for overall effect: Z = 2.40 (P = 0.02)



### E.4.2 Mental health symptoms

| Study or Subgroup | Problem solving Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2014 | 15.87 | 10.07 | 75 | 19.91 | 10.42 | 75 | 100.0% | -0.39 [-0.72, -0.07] |
| **Total (95% CI)** | | | **75** | | | **75** | **100.0%** | **-0.39 [-0.72, -0.07]** |

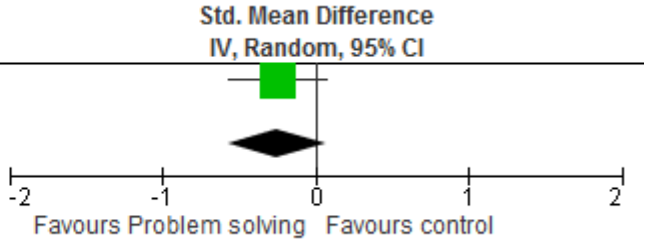
Heterogeneity: Not applicable
Test for overall effect: Z = 2.38 (P = 0.02)




### E.4.3 Absenteeism

| Study or Subgroup | Problem solving Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2014 | 1.18 | 4.27 | 75 | 2.76 | 7.75 | 75 | 100.0% | -0.25 [-0.57, 0.07] |
| **Total (95% CI)** | | | **75** | | | **75** | **100.0%** | **-0.25 [-0.57, 0.07]** |

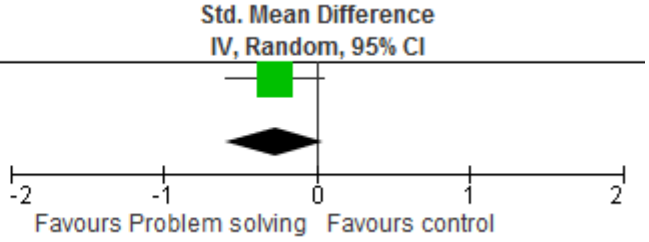
Heterogeneity: Not applicable
Test for overall effect: Z = 1.53 (P = 0.13)




### E.4.4 Quality of life

| Study or Subgroup | Problem solving Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2014 | -42.59 | 11.83 | 75 | -39.55 | 10.35 | 75 | 100.0% | -0.27 [-0.59, 0.05] |
| **Total (95% CI)** | | | **75** | | | **75** | **100.0%** | **-0.27 [-0.59, 0.05]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 1.66 (P = 0.10)

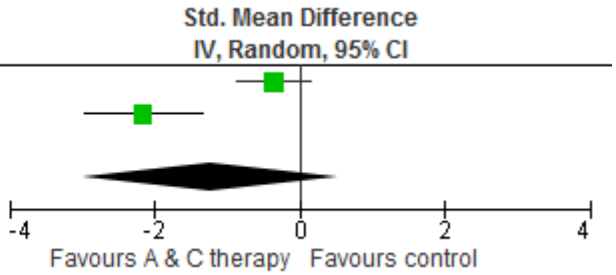


# E.5 Acceptance and commitment

## E.5.1 Mental wellbeing

| Study or Subgroup | Acceptance & commitment Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Brinkborg 2011 | 11.7 | 5 | 45 | 13.4 | 4 | 23 | 51.7% | -0.36 [-0.86, 0.15] |
| Macias 2019 | 8.11 | 3.4871 | 19 | 15.79 | 3.4871 | 19 | 48.3% | -2.16 [-2.97, -1.34] |
| **Total (95% CI)** | | | **64** | | | **42** | **100.0%** | **-1.23 [-2.99, 0.53]** |

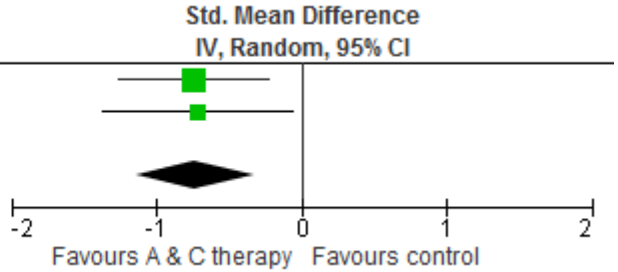
Heterogeneity: Tau² = 1.50; Chi² = 13.46, df = 1 (P = 0.0002); I² = 93%
Test for overall effect: Z = 1.37 (P = 0.17)




## E.5.2 Job stress

| Study or Subgroup | Acceptance and commitment Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Brinkborg 2011 | 24.1 | 7.9 | 45 | 29.7 | 6.4 | 23 | 61.7% | -0.74 [-1.26, -0.23] |
| Macias 2019 | 8.51 | 5.0127 | 19 | 12.24 | 5.1871 | 19 | 38.3% | -0.72 [-1.37, -0.06] |
| **Total (95% CI)** | | | **64** | | | **42** | **100.0%** | **-0.73 [-1.14, -0.33]** |

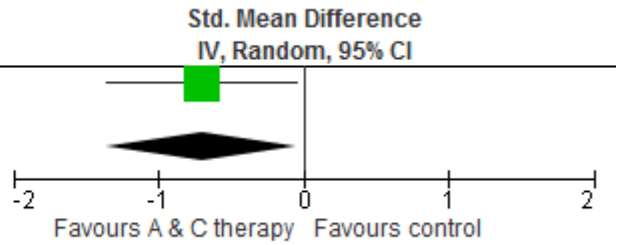
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.95); I² = 0%
Test for overall effect: Z = 3.53 (P = 0.0004)




## E.5.3 Mental health symptoms

| Study or Subgroup | Acceptance & commitment Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Macias 2019 | 10.56 | 8.7178 | 19 | 16.81 | 8.7178 | 19 | 100.0% | -0.70 [-1.36, -0.04] |
| **Total (95% CI)** | | | **19** | | | **19** | **100.0%** | **-0.70 [-1.36, -0.04]** |

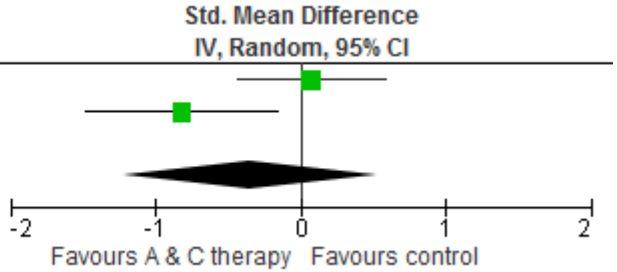
Heterogeneity: Not applicable
Test for overall effect: Z = 2.09 (P = 0.04)



### E.5.4 Job satisfaction

| Study or Subgroup | Acceptance & commitment Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Brinkborg 2011 | -30.6 | 6.7 | 46 | -31.1 | 6.2 | 22 | 53.0% | 0.08 [-0.43, 0.58] |
| Macias 2019 | -37.52 | 4.5768 | 19 | -33.69 | 4.5768 | 19 | 47.0% | -0.82 [-1.48, -0.15] |
| **Total (95% CI)** | | | **65** | | | **41** | **100.0%** | **-0.35 [-1.22, 0.53]** |

Heterogeneity: Tau² = 0.31; Chi² = 4.39, df = 1 (P = 0.04); I² = 77%
Test for overall effect: Z = 0.77 (P = 0.44)

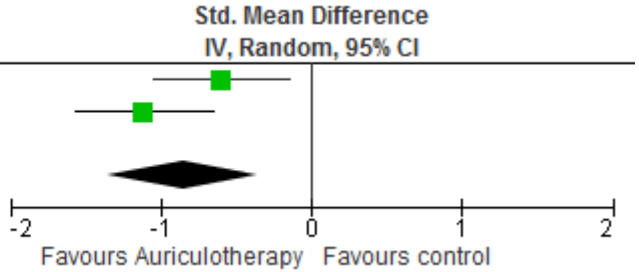



## E.6 Auriculotherapy

### E.6.1 Job stress

| Study or Subgroup | Auriculotherpy Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Kurebayashi 2014 (P) | 48.5 | 22.9 | 58 | 63.21 | 26.85 | 29 | 50.0% | -0.60 [-1.06, -0.15] |
| Prado 2018 | 41.3 | 16.4 | 43 | 66.8 | 27.6 | 43 | 50.0% | -1.11 [-1.57, -0.66] |
| **Total (95% CI)** | | | **101** | | | **72** | **100.0%** | **-0.86 [-1.36, -0.35]** |

Heterogeneity: Tau² = 0.08; Chi² = 2.43, df = 1 (P = 0.12); I² = 59%
Test for overall effect: Z = 3.34 (P = 0.0008)

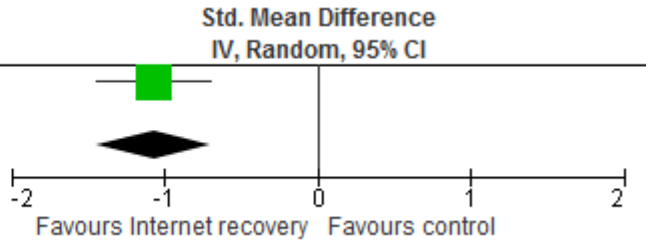


# E.7 Internet sleep recovery

## E.7.1 Mental wellbeing

| Study or Subgroup | Internet sleep recovery Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2015 | 12.64 | 4.65 | 64 | 17.02 | 3.39 | 64 | 100.0% | -1.07 [-1.44, -0.70] |
| **Total (95% CI)** | | | **64** | | | **64** | **100.0%** | **-1.07 [-1.44, -0.70]** |

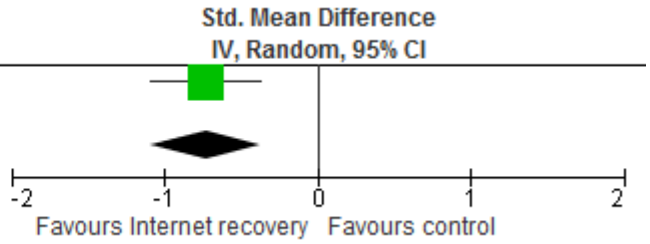
Heterogeneity: Not applicable
Test for overall effect: Z = 5.65 (P < 0.00001)




## E.7.2 Job stress

| Study or Subgroup | Internet sleep recovery Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2015 | 5.87 | 3.18 | 64 | 8.44 | 3.79 | 64 | 100.0% | -0.73 [-1.09, -0.37] |
| **Total (95% CI)** | | | **64** | | | **64** | **100.0%** | **-0.73 [-1.09, -0.37]** |

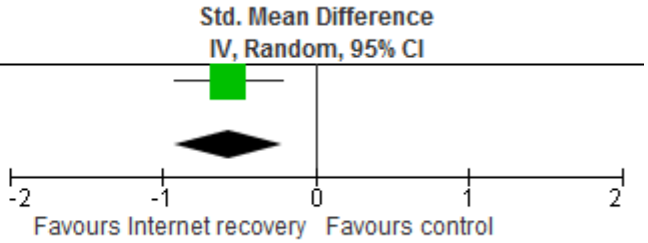
Heterogeneity: Not applicable
Test for overall effect: Z = 4.00 (P < 0.0001)




## E.7.3 Mental health symptoms

| Study or Subgroup | Internet sleep recovery Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ebert 2015 | 13.17 | 6.85 | 64 | 19.22 | 13.17 | 64 | 100.0% | -0.57 [-0.93, -0.22] |
| **Total (95% CI)** | | | **64** | | | **64** | **100.0%** | **-0.57 [-0.93, -0.22]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 3.17 (P = 0.002)

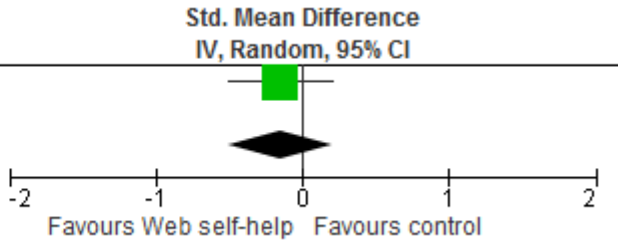


# E.8 Web-guided self-help

## E.8.1 Job stress

| Study or Subgroup | Web-guided self help Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Geraedts 2014 | 2.3 | 1.4 | 60 | 2.5 | 1.3 | 65 | 100.0% | -0.15 [-0.50, 0.20] |
| **Total (95% CI)** | | | **60** | | | **65** | **100.0%** | **-0.15 [-0.50, 0.20]** |

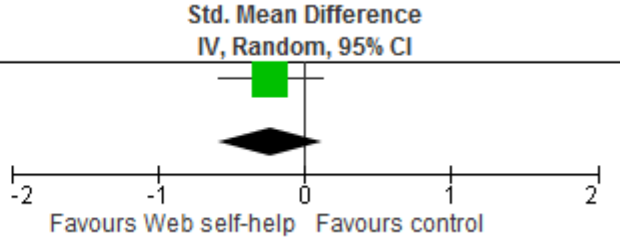
Heterogeneity: Not applicable
Test for overall effect: Z = 0.82 (P = 0.41)




## E.8.2 Mental health symptoms

| Study or Subgroup | Web-guided self-help Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Geraedts 2014 | 13.8 | 9.7 | 60 | 16.2 | 10.7 | 65 | 100.0% | -0.23 [-0.59, 0.12] |
| **Total (95% CI)** | | | **60** | | | **65** | **100.0%** | **-0.23 [-0.59, 0.12]** |

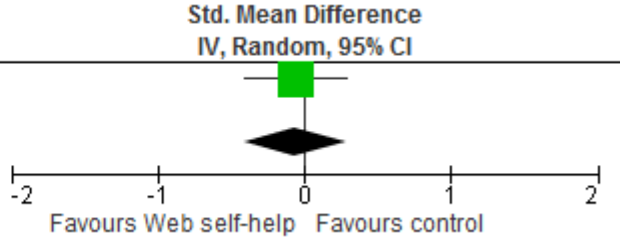
Heterogeneity: Not applicable
Test for overall effect: Z = 1.30 (P = 0.19)




## E.8.3 Productivity

| Study or Subgroup | Web-guided self-help Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Geraedts 2014 | 3.6 | 1.5 | 60 | 3.7 | 1.6 | 65 | 100.0% | -0.06 [-0.41, 0.29] |
| **Total (95% CI)** | | | **60** | | | **65** | **100.0%** | **-0.06 [-0.41, 0.29]** |

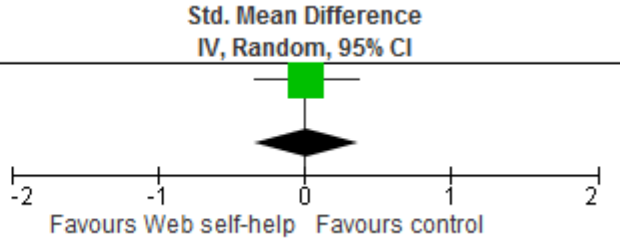
Heterogeneity: Not applicable
Test for overall effect: Z = 0.36 (P = 0.72)



### E.8.4 Absenteeism

| Study or Subgroup | Web-guided self-help Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Geraedts 2014 | 7.3 | 25.6 | 60 | 6.9 | 23.3 | 65 | 100.0% | 0.02 [-0.33, 0.37] |
| **Total (95% CI)** | | | **60** | | | **65** | **100.0%** | **0.02 [-0.33, 0.37]** |

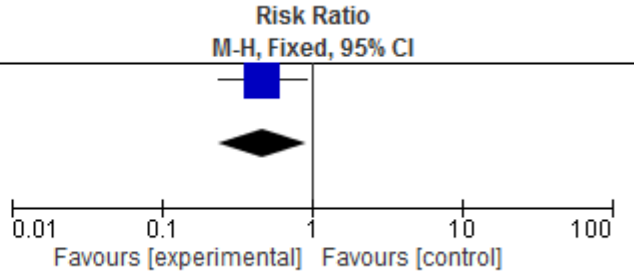
Heterogeneity: Not applicable
Test for overall effect: Z = 0.09 (P = 0.93)




### E.8.5 Uptake of support services

| Study or Subgroup | Experimental Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Geraedts 2014 | 11 | 116 | 23 | 114 | 100.0% | 0.47 [0.24, 0.92] |
| **Total (95% CI)** | | **116** | | **114** | **100.0%** | **0.47 [0.24, 0.92]** |
| Total events | 11 | | 23 | | | |

Heterogeneity: Not applicable
Test for overall effect: Z = 2.21 (P = 0.03)

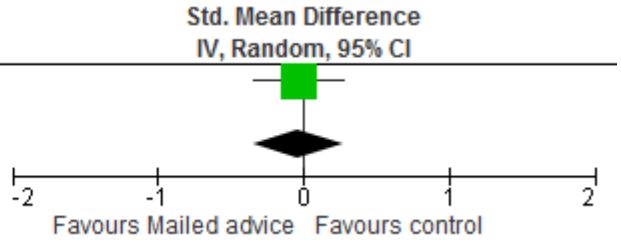



## E.9 Mailed advice

### E.9.1 Mental wellbeing

| Study or Subgroup | Individual mailed advice Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Kawakami 1999 | 3.5 | 2.9 | 81 | 3.6 | 2.5 | 77 | 100.0% | -0.04 [-0.35, 0.28] |
| **Total (95% CI)** | | | **81** | | | **77** | **100.0%** | **-0.04 [-0.35, 0.28]** |

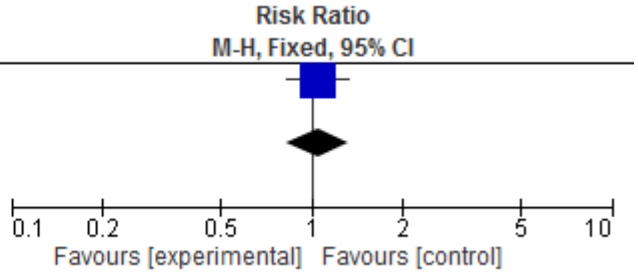
Heterogeneity: Not applicable
Test for overall effect: Z = 0.23 (P = 0.82)



### E.9.2 Absenteeism

| Study or Subgroup | Experimental Events | Experimental Total | Control Events | Control Total | Weight | Risk Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Kawakami 1999 | 53 | 81 | 48 | 77 | 100.0% | 1.05 [0.83, 1.33] |
| **Total (95% CI)** | | **81** | | **77** | **100.0%** | **1.05 [0.83, 1.33]** |
| Total events | 53 | | 48 | | | |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.40 (P = 0.69)

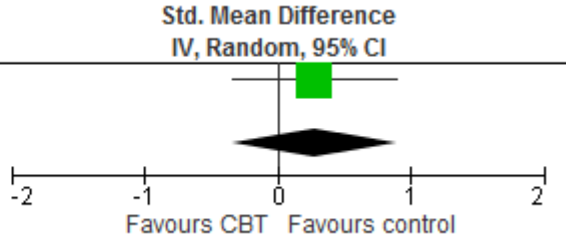



## E.10 Brief education

### E.10.1 Mental wellbeing

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Nhiwatiwa 2003 | 3.6 | 5.89 | 20 | 2.31 | 2.62 | 20 | 100.0% | 0.28 [-0.35, 0.90] |
| **Total (95% CI)** | | | **20** | | | **20** | **100.0%** | **0.28 [-0.35, 0.90]** |

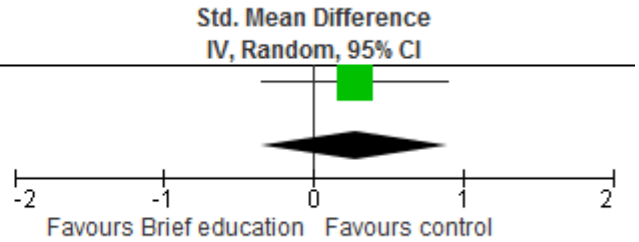
Heterogeneity: Not applicable
Test for overall effect: Z = 0.87 (P = 0.38)




### E.10.2 Job stress

| Study or Subgroup | Brief education Mean | Brief education SD | Brief education Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Nhiwatiwa 2003 | 10.4 | 16.79 | 20 | 6.62 | 8.66 | 20 | 100.0% | 0.28 [-0.35, 0.90] |
| **Total (95% CI)** | | | **20** | | | **20** | **100.0%** | **0.28 [-0.35, 0.90]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.87 (P = 0.38)

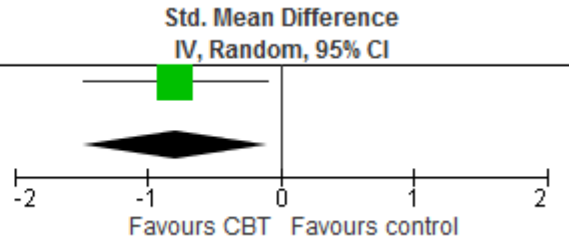


# E.11 Expressive writing

## E.11.1 Mental wellbeing

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tarquini 2016 | -64.28 | 10.95 | 18 | -55.94 | 9.4 | 17 | 100.0% | -0.80 [-1.49, -0.10] |
| **Total (95% CI)** | | | **18** | | | **17** | **100.0%** | **-0.80 [-1.49, -0.10]** |

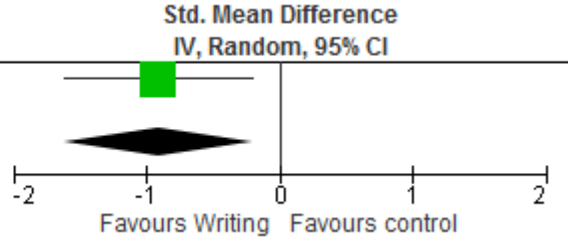
Heterogeneity: Not applicable
Test for overall effect: Z = 2.26 (P = 0.02)




## E.11.2 Job stress

| Study or Subgroup | Expressive writing Mean | Expressive writing SD | Expressive writing Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tarquini 2016 | 7.78 | 5.15 | 18 | 13.29 | 6.63 | 17 | 100.0% | -0.91 [-1.61, -0.21] |
| **Total (95% CI)** | | | **18** | | | **17** | **100.0%** | **-0.91 [-1.61, -0.21]** |

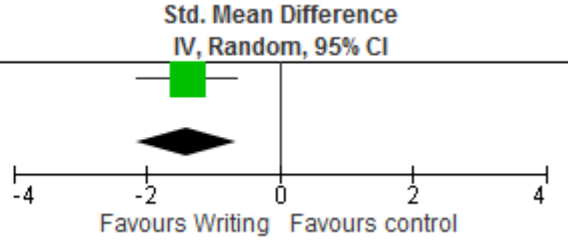
Heterogeneity: Not applicable
Test for overall effect: Z = 2.55 (P = 0.01)




## E.11.3 Mental health symptoms

| Study or Subgroup | Expressive writing Mean | Expressive writing SD | Expressive writing Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tarquini 2016 | 39.61 | 10.76 | 18 | 54.06 | 9.48 | 17 | 100.0% | -1.39 [-2.14, -0.64] |
| **Total (95% CI)** | | | **18** | | | **17** | **100.0%** | **-1.39 [-2.14, -0.64]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 3.64 (P = 0.0003)

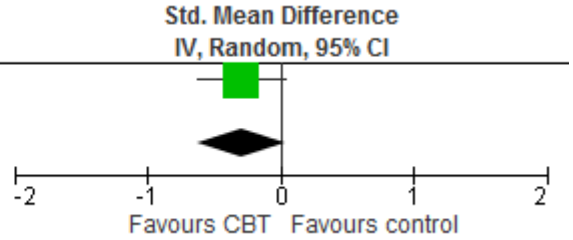


# E.12 Cognitive behaviour therapy combined with problem-solving training

## E.12.1 Job stress

| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Lexis 2011 | 32.19 | 33.29 | 69 | 42.19 | 33.78 | 70 | 100.0% | -0.30 [-0.63, 0.04] |
| **Total (95% CI)** | | | **69** | | | **70** | **100.0%** | **-0.30 [-0.63, 0.04]** |

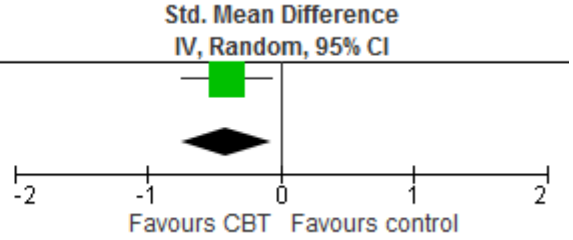
Heterogeneity: Not applicable
Test for overall effect: Z = 1.74 (P = 0.08)



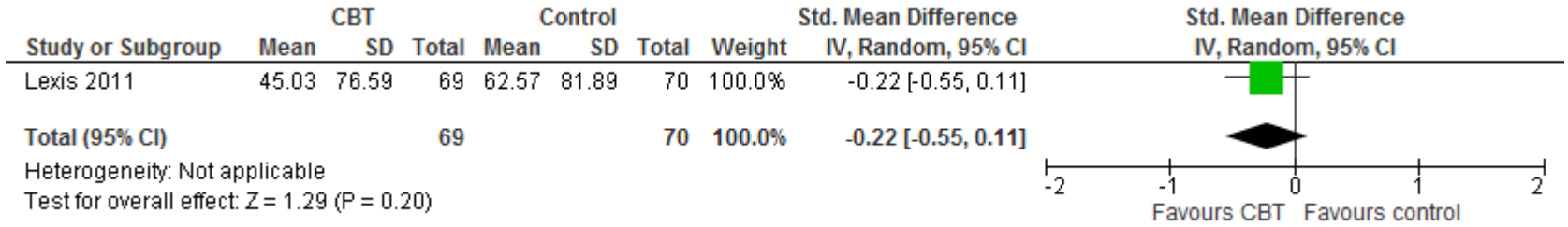

## E.12.2 Mental health symptoms

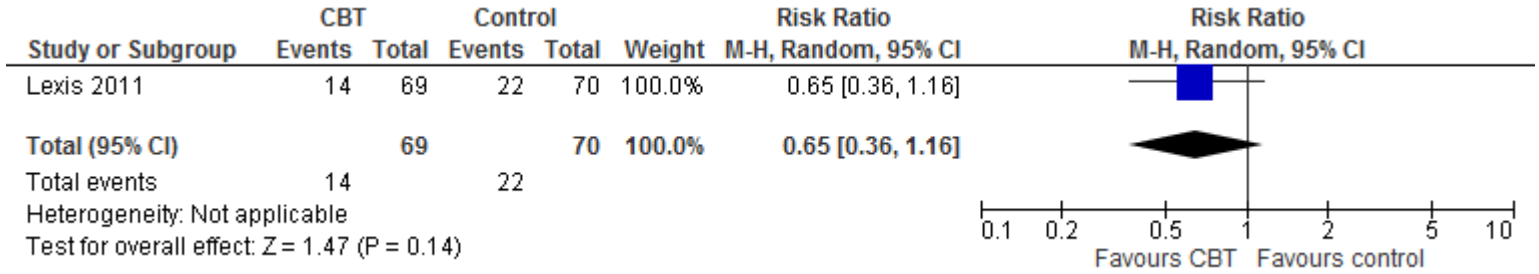
| Study or Subgroup | CBT Mean | CBT SD | CBT Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Lexis 2011 | 12.42 | 9.64 | 69 | 16.69 | 11.04 | 70 | 100.0% | -0.41 [-0.75, -0.07] |
| **Total (95% CI)** | | | **69** | | | **70** | **100.0%** | **-0.41 [-0.75, -0.07]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 2.39 (P = 0.02)



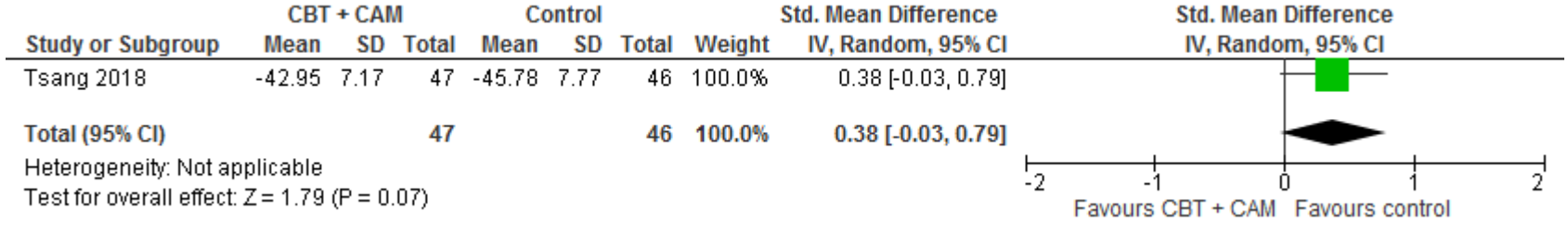
### E.12.3 Absenteeism




## E.13 Cognitive behaviour therapy combined with Complementary Alternative Therapy

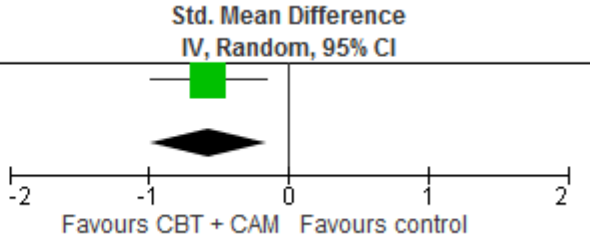
### E.13.1 Mental wellbeing



### E.13.2 Job stress

| Study or Subgroup | CBT + CAM Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tsang 2018 | 18.9 | 8.82 | 47 | 24.09 | 9.23 | 46 | 100.0% | -0.57 [-0.99, -0.16] |
| **Total (95% CI)** | | | **47** | | | **46** | **100.0%** | **-0.57 [-0.99, -0.16]** |

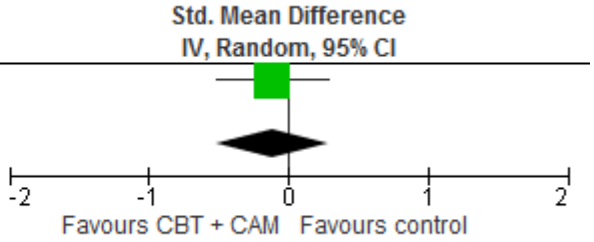
Heterogeneity: Not applicable
Test for overall effect: Z = 2.69 (P = 0.007)




### E.13.3 Mental health symptoms

| Study or Subgroup | CBT + CAM Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tsang 2018 | 13.16 | 8.63 | 47 | 14.11 | 8.01 | 46 | 100.0% | -0.11 [-0.52, 0.29] |
| **Total (95% CI)** | | | **47** | | | **46** | **100.0%** | **-0.11 [-0.52, 0.29]** |

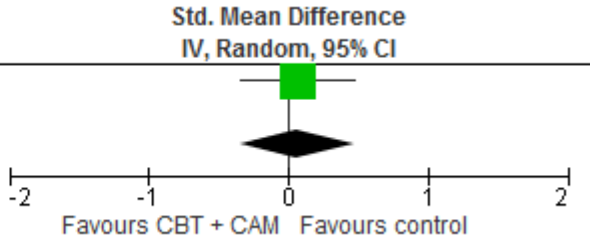
Heterogeneity: Not applicable
Test for overall effect: Z = 0.54 (P = 0.59)




### E.13.4 Job satisfaction

| Study or Subgroup | CBT + CAM Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Tsang 2018 | 21.3 | 5.25 | 47 | 20.96 | 5.46 | 46 | 100.0% | 0.06 [-0.34, 0.47] |
| **Total (95% CI)** | | | **47** | | | **46** | **100.0%** | **0.06 [-0.34, 0.47]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.30 (P = 0.76)

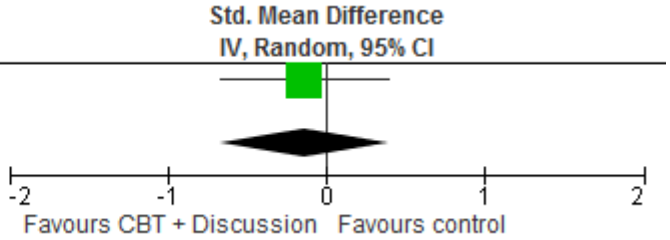


# E.14 Cognitive behaviour therapy combined with a discussion group

## E.14.1 Mental wellbeing

| Study or Subgroup | CBT + Discussion Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Carolan 2017 (D) | -9.5 | 3.3 | 26 | -9 | 3.7 | 28 | 100.0% | -0.14 [-0.67, 0.39] |
| **Total (95% CI)** | | | **26** | | | **28** | **100.0%** | **-0.14 [-0.67, 0.39]** |

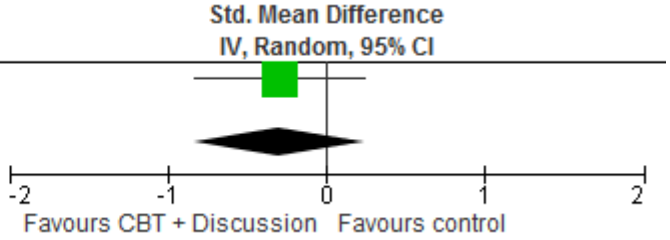
Heterogeneity: Not applicable
Test for overall effect: Z = 0.51 (P = 0.61)




## E.14.2 Job stress

| Study or Subgroup | CBT + Discussion Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Carolan 2017 (D) | 18.1 | 7.7 | 26 | 20.6 | 8.7 | 28 | 100.0% | -0.30 [-0.84, 0.24] |
| **Total (95% CI)** | | | **26** | | | **28** | **100.0%** | **-0.30 [-0.84, 0.24]** |

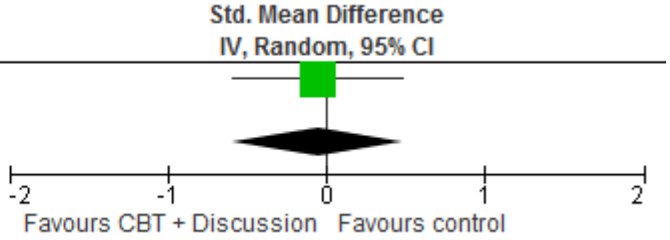
Heterogeneity: Not applicable
Test for overall effect: Z = 1.09 (P = 0.27)




## E.14.3 Mental health symptoms

| Study or Subgroup | CBT + Discussion Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Carolan 2017 (D) | 15.5 | 8.5 | 26 | 16 | 9.9 | 28 | 100.0% | -0.05 [-0.59, 0.48] |
| **Total (95% CI)** | | | **26** | | | **28** | **100.0%** | **-0.05 [-0.59, 0.48]** |

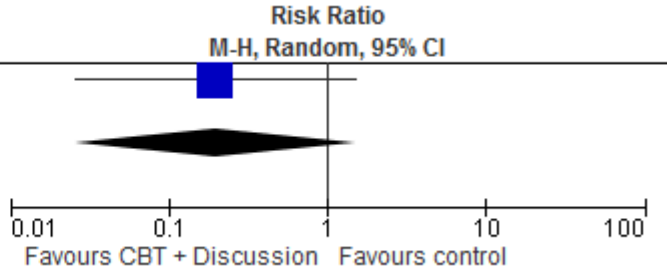
Heterogeneity: Not applicable
Test for overall effect: Z = 0.20 (P = 0.85)



### E.14.4 Absenteeism

| Study or Subgroup | CBT + Discussion Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Carolan 2017 (D) | 1 | 22 | 6 | 26 | 100.0% | 0.20 [0.03, 1.51] |
| **Total (95% CI)** | | **22** | | **26** | **100.0%** | **0.20 [0.03, 1.51]** |
| Total events | 1 | | 6 | | | |

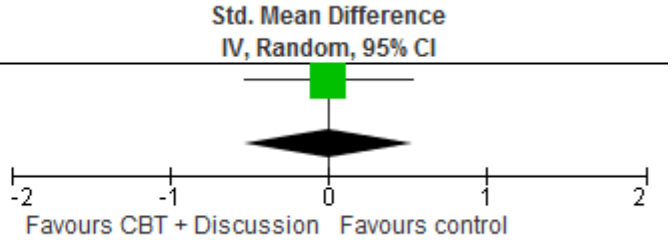
Heterogeneity: Not applicable
Test for overall effect: Z = 1.56 (P = 0.12)




### E.14.5 Job satisfaction

| Study or Subgroup | CBT + Discussion Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Carolan 2017 (D) | -9.3 | 37 | 26 | -9.3 | 4.3 | 28 | 100.0% | 0.00 [-0.53, 0.53] |
| **Total (95% CI)** | | | **26** | | | **28** | **100.0%** | **0.00 [-0.53, 0.53]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.00 (P = 1.00)

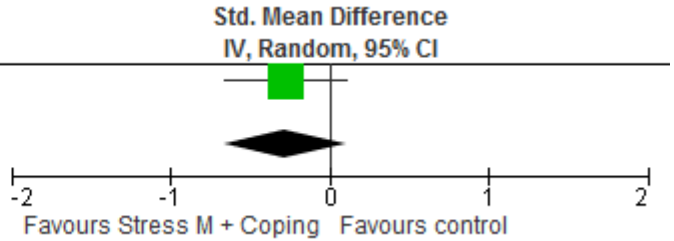



## E.15 Stress management combined with coping skills

### E.15.1 Job stress

| Study or Subgroup | Stress M + Coping Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Lindquist 1999 | 30.71 | 6.33 | 52 | 32.36 | 5.42 | 52 | 100.0% | -0.28 [-0.66, 0.11] |
| **Total (95% CI)** | | | **52** | | | **52** | **100.0%** | **-0.28 [-0.66, 0.11]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 1.41 (P = 0.16)

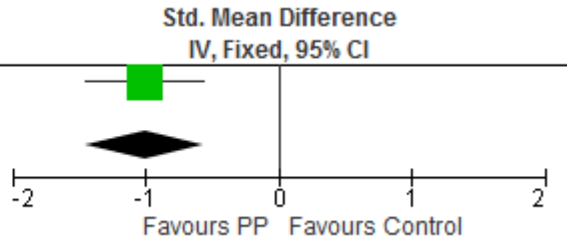


# E.16 Positive psychotherapy

## E.16.1 Mental wellbeing

| Study or Subgroup | PP Mean | PP SD | PP Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Guo 2020 | -30.64 | 4.65 | 33 | -25.3 | 5.58 | 64 | 100.0% | -1.00 [-1.45, -0.56] |
| **Total (95% CI)** | | | **33** | | | **64** | **100.0%** | **-1.00 [-1.45, -0.56]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 4.42 (P < 0.00001)

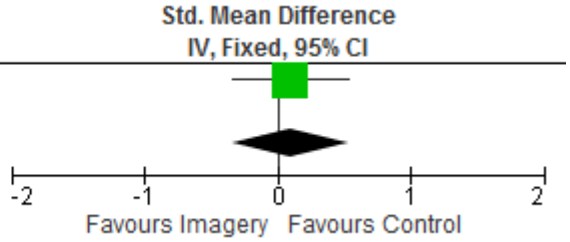



# E.17 Imagery

## E.17.1 Mental health symptoms

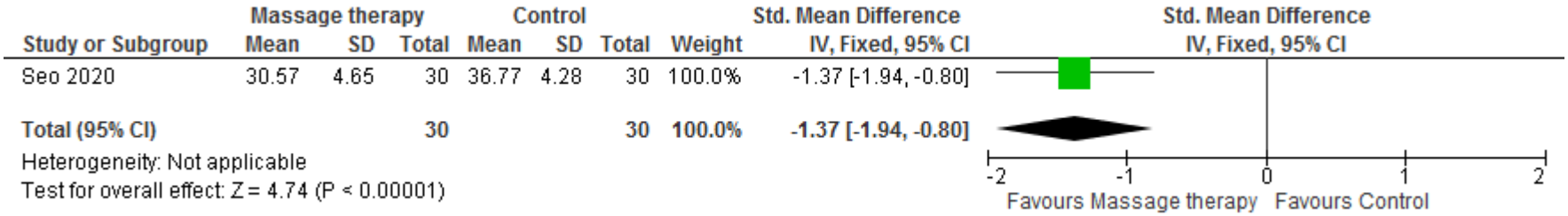
| Study or Subgroup | Imagery Mean | Imagery SD | Imagery Total | Control Mean | Control SD | Control Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Loft 2013 | 6.18 | 3.2 | 76 | 5.88 | 2.17 | 28 | 100.0% | 0.10 [-0.33, 0.53] |
| **Total (95% CI)** | | | **76** | | | **28** | **100.0%** | **0.10 [-0.33, 0.53]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.45 (P = 0.65)



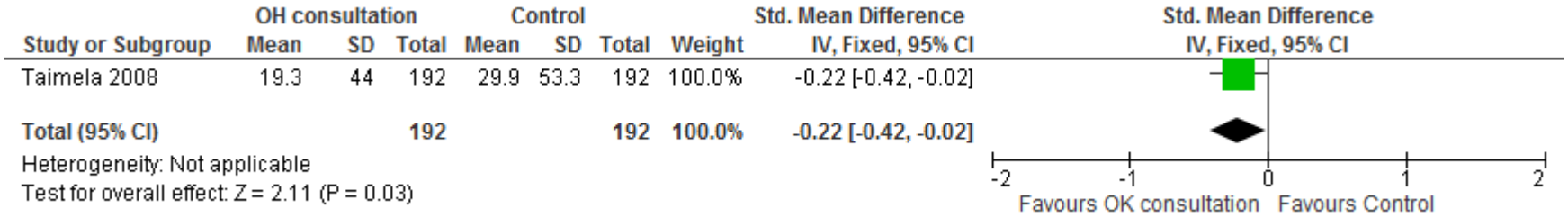
# E.18 Massage therapy

## E.18.1 Mental health symptoms




# E.19 Occupational health consultation

## E.19.1 Absenteeism

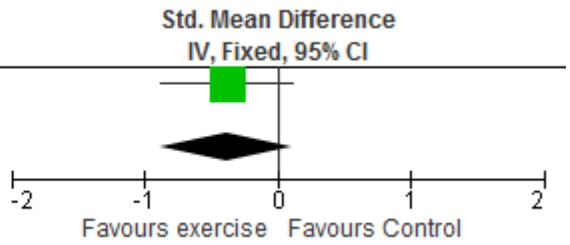


# E.20 Physical exercise

## E.20.1 Job stress

| Study or Subgroup | Exercise Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Diaz-Silveira 2020 | 0.49 | 0.14 | 30 | 0.55 | 0.17 | 34 | 100.0% | -0.38 [-0.87, 0.12] |
| **Total (95% CI)** | | | **30** | | | **34** | **100.0%** | **-0.38 [-0.87, 0.12]** |

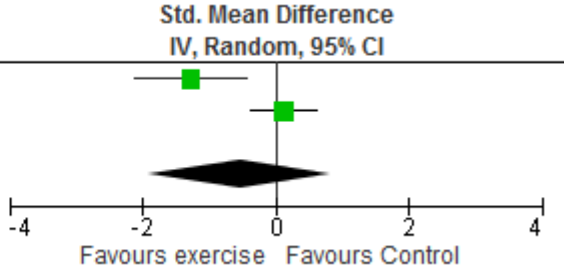
Heterogeneity: Not applicable
Test for overall effect: Z = 1.50 (P = 0.13)




## E.20.2 Mental health symptoms

| Study or Subgroup | Exercise Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| de Zeeuw 2010 | 3.1 | 1.9 | 14 | 5.8 | 2.2 | 13 | 46.9% | -1.28 [-2.12, -0.44] |
| Diaz-Silveira 2020 | 13.61 | 6.52 | 30 | 12.89 | 4.86 | 34 | 53.1% | 0.12 [-0.37, 0.62] |
| **Total (95% CI)** | | | **44** | | | **47** | **100.0%** | **-0.53 [-1.90, 0.84]** |

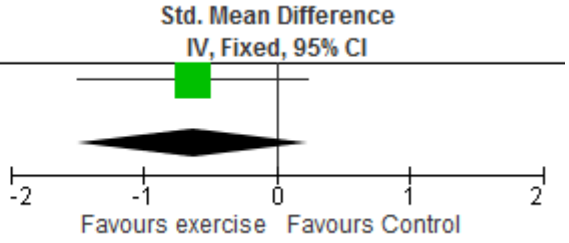
Heterogeneity: Tau² = 0.86; Chi² = 7.97, df = 1 (P = 0.005); I² = 87%
Test for overall effect: Z = 0.76 (P = 0.45)




## E.20.3 Absenteeism

| Study or Subgroup | Exercise Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| de Zeeuw 2010 | 0.8 | 1.1 | 12 | 1.9 | 2.2 | 10 | 100.0% | -0.63 [-1.49, 0.24] |
| **Total (95% CI)** | | | **12** | | | **10** | **100.0%** | **-0.63 [-1.49, 0.24]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 1.42 (P = 0.15)

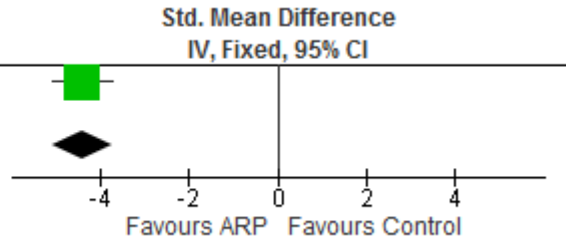


# E.21 Accelerated recovery programme

## E.21.1 Job stress

| Study or Subgroup | Accelerated recovery Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Rajeswari 2019 | 43.03 | 5.66 | 60 | 74.52 | 8.33 | 60 | 100.0% | -4.39 [-5.06, -3.72] |
| **Total (95% CI)** | | | **60** | | | **60** | **100.0%** | **-4.39 [-5.06, -3.72]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 12.87 (P < 0.00001)

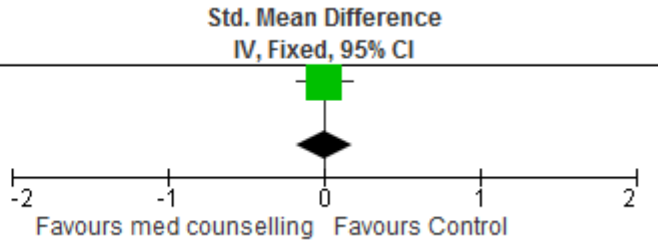



# E.22 Medical counselling

## E.22.1 Absenteeism

| Study or Subgroup | Medical counselling Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Taimela 2008 | 7 | 12.4 | 251 | 6.9 | 14.3 | 254 | 100.0% | 0.01 [-0.17, 0.18] |
| **Total (95% CI)** | | | **251** | | | **254** | **100.0%** | **0.01 [-0.17, 0.18]** |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.08 (P = 0.93)

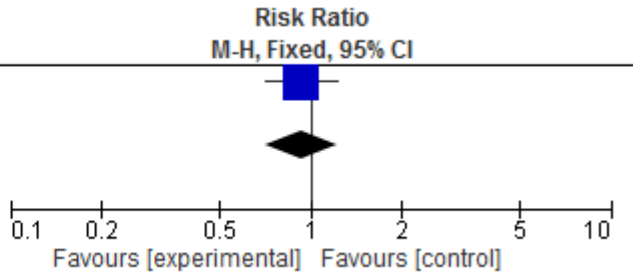


# E.23 Preventive coaching

## E.23.1 Job satisfaction

| Study or Subgroup | Preventive coaching Events | Total | Usual care Events | Total | Weight | Risk Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Duijts 2008 | 40 | 70 | 41 | 67 | 100.0% | 0.93 [0.71, 1.23] |
| **Total (95% CI)** | | **70** | | **67** | **100.0%** | **0.93 [0.71, 1.23]** |
| Total events | 40 | | 41 | | | |

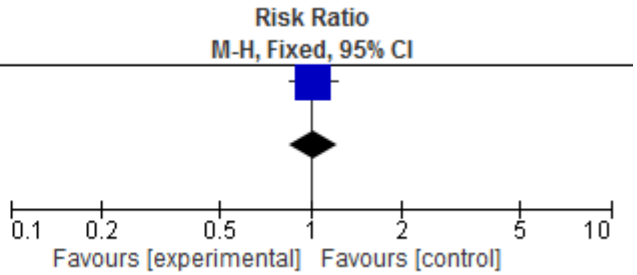
Heterogeneity: Not applicable
Test for overall effect: Z = 0.48 (P = 0.63)




## E.23.2 Absenteeism

| Study or Subgroup | Preventive coaching Events | Total | Usual care Events | Total | Weight | Risk Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Duijts 2008 | 55 | 72 | 50 | 67 | 100.0% | 1.02 [0.85, 1.24] |
| **Total (95% CI)** | | **72** | | **67** | **100.0%** | **1.02 [0.85, 1.24]** |
| Total events | 55 | | 50 | | | |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.24 (P = 0.81)



# Appendix F – GRADE and GRADE-CERQual tables

## F.1 GRADE

### F.1.1 Cognitive behaviour therapy

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | CBT | Control | Relative (95% CI) | Absolute | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | very serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 42 | 47 | - | SMD 0.48 lower (0.91 to 0.06 lower) | ⊕⊕OO LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | very serious[1] | serious inconsistency[5] | no serious indirectness[3] | serious[6] | none | 279 | 307 | - | SMD 0.15 lower (0.41 lower to 0.12 higher) | ⊕OOO VERY LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 6 | randomised trials | serious[7] | serious[5] | no serious indirectness[3] | no serious imprecision[4] | none | 482 | 514 | - | SMD 0.36 lower (0.6 to 0.12 lower) | ⊕⊕OO LOW |
| **Productivity (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[7] | NA[8] | no serious indirectness[3] | serious[5] | none | 150 | 150 | - | SMD 0.07 lower (0.3 lower to 0.15 higher) | ⊕⊕OO LOW |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[7] | serious[5] | no serious indirectness[3] | serious[5] | none | 285 | 285 | - | SMD 0.15 lower (0.43 lower to 0.14 higher) | ⊕OOO VERY LOW |
| **Absenteeism** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | randomised trials | serious[7] | NA[8] | no serious indirectness[3] | serious[6] | none | 3/23 (13%) | 3/26 (11.5%) | RR 1.13 (0.25 to 5.06) | 15 more per 1000 (from 87 fewer to 468 more) | ⊕⊕OO LOW |
| **Presenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | serious[7] | no serious inconsistency[5] | no serious indirectness[3] | no serious imprecision[4] | none | 343 | 345 | - | SMD 0.25 lower (0.43 to 0.06 lower) | ⊕⊕⊕O MODERATE |
| **Job satisfaction (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[7] | no serious inconsistency[2] | no serious indirectness[3] | serious[6] | none | 178 | 178 | - | SMD 0.09 higher (0.2 lower to 0.38 higher) | ⊕⊕OO LOW |
| **Mental health literacy (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[7] | NA[8] | no serious indirectness[3] | serious[6] | none | 150 | 150 | - | SMD 0.02 lower (0.24 lower to 0.21 higher) | ⊕⊕OO LOW |

[1] Very serious concerns due do self-reported outcomes and missing outcome data
[2] No concerns as I-squared is less than 50%
[3] No concerns as study population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Serious concerns as I-squared is between 50% and 75%
[6] Serious concerns as 95% Cis cross the line of no effect
[7] Serious concerns due to self-reported outcomes
[8] Single-study analysis

## F.1.2 Mindfulness

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Mindfulness** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 142 | 141 | - | SMD 0.57 lower (0.8 to 0.33 lower) | ⊕⊕⊕O MODERATE |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental wellbeing - HCP (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[5] | no serious indirectness[3] | no serious imprecision[4] | none | 48 | 47 | - | SMD 0.55 lower (0.96 to 0.14 lower) | ⊕⊕⊕O MODERATE |
| **Mental wellbeing - Non-HCP (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 94 | 94 | - | SMD 0.57 lower (0.87 to 0.28 lower) | ⊕⊕⊕O MODERATE |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 5 | randomised trials | serious[1] | Very serious[6] | no serious indirectness[3] | no serious imprecision[4] | none | 183 | 186 | - | SMD 0.75 lower (1.47 to 0.03 lower) | ⊕OOO VERY LOW |
| **Job stress - HCP (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 59 | 58 | - | SMD 1.62 lower (2.05 to 1.2 lower) | ⊕⊕⊕O MODERATE |
| **Job stress - Non-HCP (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | very serious[7] | Very serious[6] | no serious indirectness[3] | serious[8] | none | 94 | 94 | - | SMD 0.29 lower (0.97 lower to 0.39 higher) | ⊕OOO VERY LOW |
| **Job stress - Not specified (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[5] | no serious indirectness[3] | serious[8] | none | 30 | 34 | - | SMD 0.17 lower (0.67 lower to 0.32 higher) | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 4 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 172 | 175 | - | SMD 0.49 lower (0.79 to 0.19 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms - HCP (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[5] | no serious indirectness[3] | no serious imprecision[4] | none | 48 | 47 | - | SMD 0.68 lower (1.09 to 0.26 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms - Non-HCP (Better indicated by lower values)** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | randomised trials | very serious[7] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 94 | 94 | - | SMD 0.58 lower (0.88 to 0.29 lower) | ⊕⊕OO LOW |
| **Mental health symptoms - Not specified (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[5] | no serious indirectness[3] | serious[8] | none | 30 | 34 | - | SMD 0 higher (0.49 lower to 0.49 higher) | ⊕⊕OO LOW |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[5] | no serious indirectness[3] | no serious imprecision[4] | none | 72 | 72 | - | SMD 0.81 lower (1.15 to 0.47 lower) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] No concerns as I-squared is less than 50%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Single-study analysis
[6] Very serious concerns as I-squared is greater than 75%
[7] Very serious concerns due to self-reported outcomes and missing outcome data
[8] Serious concerns as 95% CIs cross the line of no effect

### F.1.3 Stress management

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Stress management** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 4 | randomised trials | very serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 441 | 442 | - | SMD 0.79 lower (0.98 to 0.6 lower) | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 5 | randomised trials | very serious[1] | serious[5] | no serious indirectness[3] | no serious imprecision[4] | none | 479 | 480 | - | SMD 0.67 lower (0.93 to 0.4 lower) | ⊕OOO VERY LOW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 4 | randomised trials | serious[6] | no serious inconsistency[2] | no serious indirectness[3] | serious[7] | none | 433 | 434 | - | SMD 0.06 lower (0.24 lower to 0.12 higher) | ⊕⊕OO LOW |
| **Presenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | serious[7] | none | 395 | 396 | - | SMD 0.16 lower (0.32 lower to 0.01 higher) | ⊕⊕OO LOW |
| **Job satisfaction (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 395 | 396 | - | SMD 0.17 lower (0.31 to 0.03 lower) | ⊕⊕⊕O MODERATE |
| **Quality of life (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 263 | 264 | - | SMD 0.58 lower (0.77 to 0.4 lower) | ⊕⊕⊕O MODERATE |
| **Mental health literacy (Better indicated by lower values)** | | | | | | | | | | | |
| 3 | randomised trials | serious[1] | no serious inconsistency[2] | no serious indirectness[3] | no serious imprecision[4] | none | 395 | 396 | - | SMD 0.51 lower (0.65 to 0.37 lower) | ⊕⊕⊕O MODERATE |

[1] Very serious concerns due to self-reported outcomes, missing outcome data and lack of reporting for all outcomes
[2] No concerns as I-squared is less than 50%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Serious concerns as I-squared is between 50% and 75%
[6] Serious concerns due to self-reported outcomes
[7] Serious concerns as 95% CIs cross the line of no effect

## F.1.4 Problem-solving

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Problem solving** | **Control** | **Relative (95% CI)** | **Absolute** | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 75 | 75 | - | SMD 0.4 lower (0.72 to 0.07 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 75 | 75 | - | SMD 0.39 lower (0.72 to 0.07 lower) | ⊕⊕⊕O MODERATE |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[5] | none | 75 | 75 | - | SMD 0.25 lower (0.57 lower to 0.07 higher) | ⊕⊕OO LOW |
| **Quality of life (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[5] | none | 75 | 75 | - | SMD 0.27 lower (0.59 lower to 0.05 higher) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect
[5] Serious concerns as 95% CIs cross the line of no effect

## F.1.5 Acceptance and commitment

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Acceptance and commitment therapy** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | very serious[2] | no serious indirectness[3] | serious[4] | none | 64 | 42 | - | SMD 1.23 lower (2.99 lower to 0.53 higher) | ⊕OOO VERY LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | randomised trials | serious[1] | no serious inconsistency[5] | no serious indirectness[3] | no serious imprecision[6] | none | 64 | 42 | - | SMD 0.73 lower (1.14 to 0.33 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[7] | no serious indirectness[3] | no serious imprecision[6] | none | 19 | 19 | - | SMD 0.7 lower (1.36 to 0.04 lower) | ⊕⊕⊕O MODERATE |
| **Job satisfaction (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | very serious[2] | no serious indirectness[3] | serious[4] | none | 65 | 41 | - | SMD 0.35 lower (1.22 lower to 0.53 higher) | ⊕OOO VERY LOW |

[1] Serious concerns due to self-reported outcomes
[2] Very serious concerns as I-squared is greater than 75%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as I-squared is less than 50%
[6] No concerns as 95% CIs do not cross the line of no effect
[7] Single-study analysis

## F.1.6 Auriculotherapy

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Auriculotherapy** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | serious[2] | no serious indirectness[3] | no serious imprecision[4] | none | 101 | 72 | - | SMD 0.86 lower (1.36 to 0.35 lower) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Serious concerns as I-squared is between 50% and 75%
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.7 Internet sleep recovery

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Internet sleep recovery | Control | Relative (95% CI) | Absolute | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 64 | 64 | - | SMD 1.07 lower (1.44 to 0.7 lower) | ⊕⊕⊕O MODERATE |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 64 | 64 | - | SMD 0.73 lower (1.09 to 0.37 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 64 | 64 | - | SMD 0.57 lower (0.93 to 0.22 lower) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.8 Web-guided self-help

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Web guided self-help | Control | Relative (95% CI) | Absolute | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 60 | 65 | - | SMD 0.15 lower (0.5 lower to 0.2 higher) | ⊕⊕OO LOW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 60 | 65 | - | SMD 0.23 lower (0.59 lower to 0.12 higher) | ⊕⊕OO LOW |
| **Productivity (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 60 | 65 | - | SMD 0.06 lower (0.41 lower to 0.29 higher) | ⊕⊕OO LOW |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 60 | 65 | - | SMD 0.02 higher (0.33 lower to 0.37 higher) | ⊕⊕OO LOW |
| **Uptake of support services** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[5] | none | 11/116 (9.5%) | 23/114 (20.2%) | RR 0.47 (0.24 to 0.92) | 107 fewer per 1000 (from 16 fewer to 153 fewer) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

## F.1.9 Individualised mailed advice

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Individualised mailed advice** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 81 | 77 | - | SMD 0.04 lower (0.35 lower to 0.28 higher) | ⊕⊕OO LOW |
| **Absenteeism** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 53/81 (65.4%) | 48/77 (62.3%) | RR 1.05 (0.83 to 1.33) | 31 more per 1000 (from 106 fewer to 206 more) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.10 Brief education

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Brief educational intervention** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 20 | 20 | - | SMD 0.28 higher (0.35 lower to 0.9 higher) | ⊕⊕OO LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 20 | 20 | - | SMD 0.28 higher (0.35 lower to 0.9 higher) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.11 Expressive writing

| Quality assessment | No of patients | Effect | Quality |
|---|---|---|---|

| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Expressive writing | Control | Relative (95% CI) | Absolute | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 18 | 17 | - | SMD 0.8 lower (1.49 to 0.1 lower) | ⊕OOO VERY LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 18 | 17 | - | SMD 0.91 lower (1.61 to 0.21 lower) | ⊕OOO VERY LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 18 | 17 | - | SMD 1.39 lower (2.14 to 0.64 lower) | ⊕OOO VERY LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.12 Cognitive behaviour therapy combined with problem-solving training

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | CBT + PST | Control | Relative (95% CI) | Absolute | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 69 | 70 | - | SMD 0.3 lower (0.63 lower to 0.04 higher) | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[5] | none | 69 | 70 | - | SMD 0.41 lower (0.75 to 0.07 lower) | ⊕⊕⊕O MODERATE |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 69 | 70 | - | SMD 0.22 lower (0.55 lower to 0.11 higher) | ⊕⊕OO LOW |
| **Absenteeism** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 14/69 (20.3%) | 22/70 (31.4%) | RR 0.65 (0.36 to 1.16) | 110 fewer per 1000 (from 201 fewer to 50 more) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

## F.1.13 Cognitive behaviour therapy combined with Complementary Alternative Therapy

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **CBT + CAM** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 47 | 46 | - | SMD 0.38 higher (0.03 lower to 0.79 higher) | ⊕OOO VERY LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[5] | none | 47 | 46 | - | SMD 0.57 lower (0.99 to 0.16 lower) | ⊕OOO VERY LOW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 47 | 46 | - | SMD 0.11 lower (0.52 lower to 0.29 higher) | ⊕OOO VERY LOW |
| **Job satisfaction (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | observational studies | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 47 | 46 | - | SMD 0.06 higher (0.34 lower to 0.47 higher) | ⊕OOO VERY LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

## F.1.14 Cognitive behaviour therapy combined with a discussion group

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **CBT + Discussion** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 26 | 28 | - | SMD 0.14 lower (0.67 lower to 0.39 higher) | ⊕⊕OO LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 26 | 28 | - | SMD 0.3 lower (0.84 lower to 0.24 higher) | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 26 | 28 | - | SMD 0.05 lower (0.59 lower to 0.48 higher) | ⊕⊕OO LOW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Absenteeism** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 1/22 (4.5%) | 6/26 (23.1%) | RR 0.2 (0.03 to 1.51) | 185 fewer per 1000 (from 224 fewer to 118 more) | ⊕⊕OO LOW |
| **Job satisfaction (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 26 | 28 | - | SMD 0 higher (0.53 lower to 0.53 higher) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.15 Stress management combined with coping skills

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No of studies** | **Design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **Stress management + coping** | **Control** | **Relative (95% CI)** | **Absolute** | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 52 | 52 | - | SMD 0.28 lower (0.66 lower to 0.11 higher) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.16 Positive psychotherapy

| Quality assessment | No of patients | Effect | Quality |
|---|---|---|---|

| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Positive psychotherapy | Control | Relative (95% CI) | Absolute | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | very serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 33 | 64 | - | SMD 1 lower (1.45 to 0.56 lower) | ⊕⊕OO LOW |

[1] Ver serious concerns due to self-reported outcomes and lack of primary outcome reporting
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.17 Imagery

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Imagery | Control | Relative (95% CI) | Absolute | |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | no serious risk of bias[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 76 | 28 | - | SMD 0.1 higher (0.33 lower to 0.53 higher) | ⊕⊕⊕O MODERATE |

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.18 Massage therapy

| Quality assessment | No of patients | Effect | Quality |
|---|---|---|---|

| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Massage therapy | Control | Relative (95% CI) | Absolute | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 30 | 30 | - | SMD 1.37 lower (1.94 to 0.8 lower) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.19 Occupational health consultation

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | OH Consultation | Control | Relative (95% CI) | Absolute | |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | no serious risk of bias[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 192 | 192 | - | SMD 0.22 lower (0.42 to 0.02 lower) | ⊕⊕⊕⊕ HIGH |

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.20 Physical exercise

| Quality assessment | No of patients | Effect | Quality |
|---|---|---|---|

| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Exercise | Control | Relative (95% CI) | Absolute | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 30 | 34 | - | SMD 0.38 lower (0.87 lower to 0.12 higher) | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 2 | randomised trials | serious[1] | very serious[5] | no serious indirectness[3] | serious[4] | none | 30 | 34 | - | SMD 0.53 lower (1.9 lower to 0.84 higher) | ⊕OOO VERY LOW |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | no serious risk of bias[6] | NA[2] | no serious indirectness[3] | serious[4] | none | 12 | 10 | - | SMD 0.63 lower (1.49 lower to 0.24 higher) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] Very serious concerns as I-squared is greater than 75%
[6] No concerns

## F.1.21 Accelerated recovery programme

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Accelerated recovery programme | Control | Relative (95% CI) | Absolute | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[4] | none | 60 | 60 | - | SMD 4.39 lower (5.06 to 3.72 lower) | ⊕⊕⊕O MODERATE |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis

[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] No concerns as 95% CIs do not cross the line of no effect

## F.1.22 Medical counselling

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Telephone counselling | Control | Relative (95% CI) | Absolute | |
| **Absenteeism (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | no serious risk of bias[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 251 | 251 | - | SMD 0.01 higher (0.17 lower to 0.18 higher) | ⊕⊕⊕O MODERATE |

[1] No concerns
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

## F.1.23 Affect school

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Affect school | Control | Relative (95% CI) | Absolute | |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 20 | 17 | - | Effect size 1.16 vs 0.26[5] | ⊕⊕OO LOW |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 20 | 17 | - | Effect size 0.47 vs 0.11[5] | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Concerns over imprecision as no variance was provided
[5] Effect size calculation so that positive = improvement and negative = deterioration

## F.1.24 Preventive coaching

| Quality assessment | | | | | | | No of patients | | Effect | | Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of studies | Design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Preventive coaching | Control | Relative (95% CI) | Absolute | |
| **Mental wellbeing (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 76 | 75 | - | Difference in change scores 2.24 lower (4.9 lower to 0.42 higher) | ⊕⊕OO LOW |
| **Job stress (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[5] | none | 76 | 75 | - | Difference in change scores 0.51 lower (0.83 to 0.18 lower) | ⊕⊕⊕O MODERATE |
| **Mental health symptoms (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[5] | none | 76 | 75 | - | Difference in change scores 1.43 lower (2.47 to 0.4 lower) | ⊕⊕⊕O MODERATE |
| **Quality of life (Better indicated by lower values)** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | no serious imprecision[5] | none | 76 | 75 | - | Difference in change scores 0.39 lower (0.66 to 0.11 lower) | ⊕⊕⊕O MODERATE |
| **Job satisfaction** | | | | | | | | | | | |
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 40/70 (57.1%) | 41/67 (61.2%) | RR 0.93 (0.71 to 1.23) | 43 fewer per 1000 (from 177 fewer to 141 more) | ⊕⊕OO LOW |
| **Absenteeism** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | randomised trials | serious[1] | NA[2] | no serious indirectness[3] | serious[4] | none | 55/72 (76.4%) | 50/67 (74.6%) | RR 1.02 (0.85 to 1.24) | 15 more per 1000 (from 112 fewer to 179 more) | ⊕⊕OO LOW |

[1] Serious concerns due to self-reported outcomes
[2] Single-study analysis
[3] No concerns as population, intervention, comparator and outcome match the review protocol
[4] Serious concerns as 95% CIs cross the line of no effect
[5] No concerns as 95% CIs do not cross the line of no effect

# F.2 GRADE-CERQual

## F.2.1 Acceptability

| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| ***Positive aspects of digital mental health interventions*** | | | | | | |
| **Convenience.** Participants liked being able to access the intervention a t their own pace and when convenient to them. Some participants valued the ability to take time out from a stressful situation in the workplace and to focus on themselves.<br>**Discreteness and anonymity.** Participants felt that the anonymity of the intervention help overcome their fear of being stigmatised for revealing their mental health issues or colleagues and employers. It was | Carolan 2017 | **No concerns**<br>(1 study with low risk of bias) | **No concerns**<br>Finding reflects all the data reported on this theme. | **Minor concerns**<br>Data obtained from a single study | **Major concerns**<br>Included study related to the views and experiences of employees but no data for employers or those delivering the intervention. | **Low confidence**.<br>Lack of data on views and experiences of employers or those delivering the intervention |

| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| seen as a useful way of engaging with support. | | | | | | |
| ***Negative aspects of digital mental health interventions*** | | | | | | |
| **Need for discipline.** Some missed the discipline that having a fixed appointment gives. | Carolan 2017 | **No concerns** (1 study with low risk of bias) | **No concerns** Finding reflects all the data reported on this theme. | **Minor concerns** Data obtained from a single study | **Major concerns** Included study related to the views and experiences of employees but no data for employers or those delivering the intervention. | **Low confidence**. Lack of data on views and experiences of employers or those delivering the intervention |

### F.2.2 Barriers

| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| ***Time needed for the intervention*** | | | | | | |
| Over half of the participants found it difficult to fine the time to do the intervention citing lack of time and workloads as the main reasons for not engaging as much as they would have liked. | Carolan 2017 | **No concerns** (1 study with low risk of bias) | **No concerns** Finding reflects all the data reported on this theme. | **Minor concerns** Data obtained from a single study | **Major concerns** Included study related to the views and experiences of employees but no data for employers or those delivering the intervention. | **Low confidence**. Lack of data on views and experiences of employers or those delivering the intervention |
| ***Context*** | | | | | | |
| **Motivation.** it was noted that for some people the mental health symptoms they were experiencing may mean they lacked the motivation to engage with the intervention.<br>**Self-image.** Some were aware that they presented themselves as strong and capable to colleagues. Having to reflect on their mental health while in the workplace may make them feel exposed<br>**E-Coach.** Some did not engage with the E-Coach, others were unclear what their role was. Where participants had engaged with the e-coach some found it helpful while others found it less so, | Carolan 2017 | **No concerns** (1 study with low risk of bias) | **No concerns** Finding reflects all the data reported on this theme. | **Minor concerns** Data obtained from a single study | **Major concerns** Included study related to the views and experiences of employees but no data for employers or those delivering the intervention. | **Low confidence**. Lack of data on views and experiences of employers or those delivering the intervention |

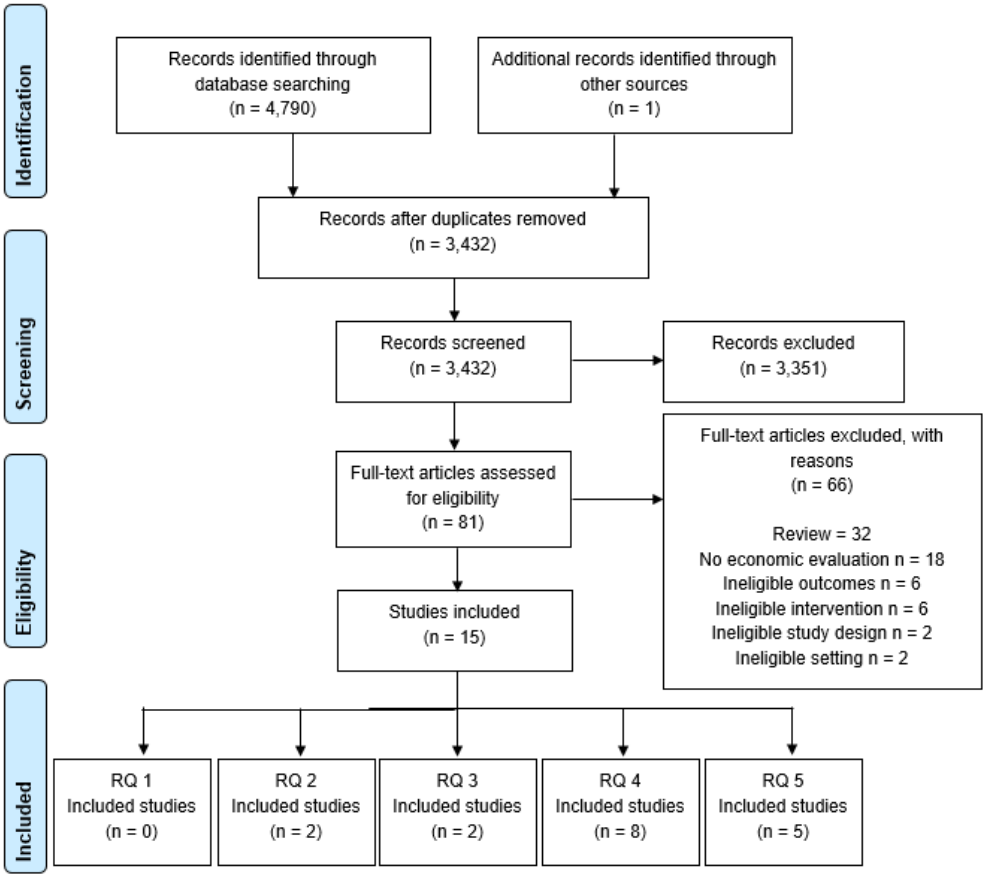
| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| **Setting** | | | | | | |
| **Physical space in the workplace.** There were concerns over accessing the system in an open-plan office where privacy was a concern.<br>**Separating work from therapy.** Some participants that they missed out on they did not benefit from having the spatial distance or temporal space from work that they would with a face- to- face appointment. | Carolan 2017 | **No concerns**<br>(1 study with low risk of bias) | **No concerns**<br>Finding reflects all the data reported on this theme. | **Minor concerns**<br>Data obtained from a single study | **Major concerns**<br>Included study related to the views and experiences of employees but no data for employers or those delivering the intervention. | **Low confidence**.<br>Lack of data on views and experiences of employers or those delivering the intervention |

### F.2.3 Facilitators

| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| ***Programme content and design*** | | | | | | |
| It was noted that interesting content and interactive features made it easier for participants to engage with the intervention. For example, know how long each module would take allowed participants to schedule and plan while progress meters and reminders and weekly motivational | Carolan 2017 | **No concerns**<br>(1 study with low risk of bias) | **No concerns**<br>Finding reflects all the data reported on this theme. | **Minor concerns**<br>Data obtained from a single study | **Minor concerns**<br>Included study related to the views and experiences of manager but no data for | **Moderate confidence**.<br>Lack of data on views and experiences of those delivering the |

| Summary of review finding | Studies contributing to review finding | Methodological limitations | Coherence | Adequacy | Relevance | CERQual assessment of confidence in the evidence |
|---|---|---|---|---|---|---|
| message from e-Coach were also useful features. | | | | | employers or those delivering the intervention and only limited information on employees. | intervention or employers and only limited information for employees. |
| ***Promotion by managers and employers*** | | | | | | |
| Participants consider it imported to have the support of line-managers and employers and they considered that this give the intervention a level of legitimacy. | Carolan 2017 | **No concerns** (1 study with low risk of bias) | **No concerns** Finding reflects all the data reported on this theme. | **Minor concerns** Data obtained from a single study | **Minor concerns** Included study related to the views and experiences of manager but no data for employers or those delivering the intervention and only limited information on employees. | **Moderate confidence**. Lack of data on views and experiences of those delivering the intervention or employers and only limited information for employees. |

# Appendix G – Economic evidence study selection



# Appendix H - Economic evidence tables

## H.1 Study details

| Callander (2017) | | | | | | |
|---|---|---|---|---|---|---|
| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Study type:** Randomised controlled trial (RCT) with cost-benefit analysis (CBA) from the employer's perspective<br><br>**Country:** Australia<br><br>**Population:** Employees screened with depressive symptoms for the intervention, employees who did not screen with depressive symptoms for the control group<br><br>**Sample size:** 486<br><br>**Interventions:** | **Perspective:** Employer's perspective<br><br>**Time horizon:** 12-months<br><br>**Discounting:** NA<br><br>**Data sources**<br>**Costs:** From RCT; set-up costs and self-reported salary for costs relating to productivity. Psychologist hourly rate from published data<br><br>**Effects:** From RCT; absolute presenteeism (AP) calculation based on two questions in the Health and Work Performance Questionnaire (HPQ) | **AP cost reduction per person; mean, AUD $:** Case management 1,597 (=£1,126.44 in 2020 GBP) [a]<br><br>Single intervention 283 (=£199.61 in 2020 GBP) [a]<br><br>Control group -2,626 (=-£1,852.24in 2020 GBP) [a]<br><br>**Intervention cost per person; AUD $:** Case management 398.57 (=£281.13 in 2020 GBP) [a]<br>Single intervention 47.16 (=£33.26 in 2020 GBP) [a]<br><br>Control group 0.27 (=£0.19 in 2020 GBP) [a] | **Effectiveness:** Not reported | **Net gain per person; AUS $:** Case management 1,198.51 (=£845.37 in 2020 GBP) [a]<br><br>Single intervention 236.05 (=£166.50 in 2020 GBP) [a]<br><br>Control group -2,625.83 (=-£1,852.12 in 2020 GBP) [a]<br><br>**Uncertainty:** Not reported | **Author identified:**<br>• Workforce productivity is self-reported<br>• The reasons driving the significant decrease in workforce productivity in the control group were not explored<br>• Intervention cost may not accurately reflect the time participants spent in contact with psychologists<br><br>**Reviewer identified:**<br>• Limits benefits to productivity<br>• Uncertainty is not explored | **Source of funding:** Not reported<br><br>**Further research:** Future studies should attempt to assess the financial benefit associated with different mental health interventions implemented in the workplace |

| Callander (2017) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| The Work Outcomes Research Cost-benefit (WORC) project intervention aims to reduce depressive symptoms.<br>The single intervention group received one phone call from a project psychologist, averaging 1 hour in length.<br>The case management group received ongoing telephone-based support from a project psychologist, averaging 8.5 contact hours per participant<br><br>**Comparator:**<br>The control group received no intervention following screening | | | | | | |
| **Overall applicability: Partly applicable** **Overall quality: Minor limitations** | | | | | | |
| *Abbreviations: AP: absolute presenteeism; CBA: cost-benefit analysis; HPQ: Health and Work Performance Questionnaire; RCT: randomised controlled trial; WORC: Work Outcomes Research Cost-benefit* | | | | | | |

| Callander (2017) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| a. Converted by YHEC using historical exchange rates and PSSRU inflation indices | | | | | | |

| Ebert (2018) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Study type:**<br>Randomised controlled trial (RCT) with cost-benefit (CBA) and cost-effectiveness analysis (CEA)<br><br>**Country:**<br>Germany<br><br>**Population:**<br>Adults who were currently employed and had elevated perceived stress (score ≥ 22 on the perceived stress scale (PSS-10))<br><br>**Sample size:**<br>264<br><br>**Intervention:**<br>An internet-based stress management intervention (iSMI) that consists of 7 sessions of problem-solving | **Perspective:**<br>Employer's perspective<br><br>**Time horizon:**<br>6 months<br><br>**Discounting:**<br>NA<br><br>**Data sources**<br>**Costs [a]:**<br>From RCT; absenteeism and presenteeism calculated using self-reported monthly salary, intervention costs estimated by the intervention provider<br><br>**Effects:**<br>From RCT | **Total cost per person [b]; mean, €:**<br>iSMI 3223 (=£3,043.60 in 2020 GBP) [e]<br><br>WLC 3412 (=£3,222.08 in 2020 GBP) [e]<br><br>**Intervention cost per person; €:**<br>iSMI 299 (=£282.36 in 2020 GBP) [e]<br><br>WLC 0<br><br>**Currency & cost year:**<br>EUR (€); 2013 | **Effectiveness; mean (SD):**<br>improvement in PSS score between pre- and 6-month follow up<br><br>iSMI<br>9.75 (6)<br><br>WLC<br>3.0 (6) | **ICER (95% CI); €:**<br>iSMI vs. WLC<br>- 521 (-3,123 to 1,900) per symptom-free person [c]<br><br>iSMI dominates WLC (lower cost and better outcomes)<br><br>**Net benefit; €:**<br>181 (-643 to 1042) saving per participant in first 6 months<br><br>**ROI (95% CI); €:**<br>0.61 (-2.2 to 3.5) per euro invested<br><br>**Uncertainty:**<br>There is a 67% probability that the iSMI generates better outcomes at lower costs compared with the WLC. If the employer is willing to pay €500, €1000 and €2000, respectively, for one additional | **Author identified:**<br>• Underpowered for economic analysis<br>• Population includes only those who are severely distressed (high PSS score)<br>• Self-selection of participant restricts the generalisability of results to employees willing to utilize such an intervention<br>• Other work-related costs were not included and could lead to greater cost-savings<br><br>**Reviewer identified:**<br>None | **Source of funding:**<br>German healthcare insurance firm BARMER and the European Commission<br><br>**Further research:**<br>• Long-term impact of the occupational mental health interventions<br>• CEA for employees with lower stress-levels<br>• Evaluate cost-effectiveness from other perspectives |

| Ebert (2018) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| and emotion-regulation techniques with 1 boost session 4 weeks after training completion<br><br>**Comparator(s):** Waitlist control (WLC) with unrestricted access to treatment as usual | | | | symptom-free person, then there is an 80%, 90% and 98% probability that the iSMI is cost-effective compared with the WLC. | | |
| **Overall applicability: Partly applicable** **Overall quality: Minor limitations** | | | | | | |
| *Abbreviations: CI: confidence interval; ICER: incremental cost-effectiveness ratio; iSMI: internet stress-management intervention; PSS: perceived stress scale; QALY: quality-adjusted life year; RIO: return on investment; TiC-P: Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness; WLC: waitlist control* | | | | | | |
| a. Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness (TiC-P) is a self-reported questionnaire that was used to estimate absenteeism and presenteeism costs. | | | | | | |
| b. Total costs were the absenteeism, presenteeism and intervention costs. | | | | | | |
| c. Symptom-free status was measured using the perceived stress scale (PPS-10). Symptom-free status was achieved when a participant scored > 2 standard deviations below then mean PPS-10 at baseline. | | | | | | |
| d. ROI was calculated as the total net benefit (from absenteeism and presenteeism) divided by the intervention cost. | | | | | | |
| e. Converted by YHEC using historical exchange rates and PSSRU inflation indices. | | | | | | |

| Geraedts (2015) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Study type:** Randomised controlled trial (RCT) with cost-benefit analysis | **Perspective:** Employer's and societal perspective<br><br>**Time horizon:** | **Total costs per person; mean, € (SE):** <u>Societal perspective</u> Intervention | **Incremental effects (95% CI):** Intervention vs. control <u>Both perspectives</u> CES-D | **ICER; €:** <u>Societal perspective</u> 314 per 1-point decrease in depression symptoms | **Author identified:** • Low percentage of complete data (54% effect, 46% costs) - | **Source of funding:** Not reported<br><br>**Further research:** |

| Geraedts (2015) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| (CBA) from the employer's perspective and cost-effectiveness analysis (CEA) from both an employer and societal perspective<br><br>**Country:**<br>Netherlands<br><br>**Population:**<br>Employees with elevated depressive symptoms (CES-D >=16) and were not on sick leave<br><br>**Sample size:**<br>231<br><br>**Intervention [a]:**<br>Happy@Work is a web-based self-help intervention that consists of problem-solving treatment and cognitive therapy. There are 6 weekly lessons with different themes. Participants | 12-months<br><br>**Discounting:**<br>NA<br><br>**Data sources**<br>**Costs [b]:**<br>From RCT; standard prices calculated using the Dutch Manual for Costing, or according to professional organisations, and medication costs from the Royal Dutch Society for Pharmacy<br><br>**Effects:**<br>From RCT<br><br>**Other:**<br>The study considers 3 effect measures; depressive symptoms measured using the Center for Epidemiological Studies Depression-scale (CES-D) [c], clinical significant change (CSC) for depressive symptoms at 1-year and quality-adjusted | 22,402 (1953) (=£20,595.56 in 2020 GBP) [e]<br><br>Control<br>23,115 (1357) (=£21,251.06 in 2020 GBP) [e]<br><br><u>Employer perspective</u><br>Intervention<br>22,974 (3172) (=£21,121.43 in 2020 GBP) [e]<br><br>Control<br>23,482 (2314) (=£21,588.47 in 2020 GBP) [e]<br><br>**Intervention costs per person; €:**<br><u>Societal perspective</u><br>236 (=£216.97 in 2020 GBP) [e]<br><br><u>Employer perspective</u><br>285 (=£262.02 in 2020 GBP) [e]<br><br>**Currency & cost year:**<br>EUR (€); 2012 | -2.3 (-4.3 to -0.3)<br><br>CSC<br>0.1 (0.0 to 0.2)<br><br>QALYs<br>0.00 (-0.04 to 0.04)<br><br>Note: only incremental effectiveness was reported | -6654 per extra participant with a clinically significant improvement in depression symptoms<br><br>532,959 per QALY gained<br><br><u>Employer perspective</u><br>224 per 1-point decrease in depression symptoms<br><br>-4664 per extra participant with a clinically significant improvement in depression symptoms<br><br>382,354 per QALY gained<br><br>**Net benefit (95% CI); €:**<br><u>Employer perspective</u><br>508 (-7029 to 8160)<br><br>**Benefit cost ratio (95% CI):**<br><u>Employer perspective</u><br>2.8 (-25.7 to 27.6) | imputations techniques were used but may be bias due to missing data<br>• Measure were self-reported and may be vulnerable to recall bias<br>• Lack of power since power calculation based on clinical outcomes not economic outcomes<br><br>**Reviewer identified:**<br>None | Further research is necessary to assess whether web-based interventions can reduce sickness absence due to depression in European countries. |

| Geraedts (2015) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| complete an assignment after each lesson and receive feedback from their coach (a Master-level students in clinical psychology).<br><br>**Comparator [a]:** Care as usual (CAU) group received an email advising them to consult their occupational physician or a psychologist if they required treatment. | life-years (QALYs) using EQ-5D | | | **Return on Investment (95% CI); %:**<br>Employer perspective<br>178 (-2466 to 2863)<br><br>**Uncertainty:**<br>Societal perspective<br>For depressive symptoms, 62.1% of cost-pairs indicated that the intervention was more-effective and less costly than CAU. At a willingness to pay (WTP) of zero and of €2,000 per point improvement, the probability of the intervention being cost-effective in comparison with CAU is 0.62 and 0.95, respectively.<br>For CSC, the probability of the intervention being cost-effective compared with CAU is 0.95 at a WTP of €44,000 per participant with a clinically significant change in depressive symptoms.<br>The maximum probability of the | | |

| Geraedts (2015) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| | | | | intervention being cost-effective in terms of QALYs gained was 0.62, irrespective of the WTP.<br><u>Employer perspective</u><br>For depressive symptoms, 62.0% of cost-pairs indicated that the intervention was more effective and less costly than CAU. At a WTP of zero and of €3,500 per point improvement, the probability of the intervention being cost-effective in comparison with CAU is 0.55 and 0.95, respectively. For a participant with a clinically significant change in depressive symptoms, a 0.95 probability of cost-effectiveness was reached at a WTP of €115,000.<br>The maximum probability of the intervention being cost-effective in terms of QALYs gained was 0.55, irrespective of the WTP. | | |

| Geraedts (2015) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| | | | | Effect and cost differences were only slightly different in the sensitivity analyses and did not lead to different conclusions, indicating that the findings were robust. | | |
| **Overall applicability: Partly applicable** **Overall quality: Minor limitations** | | | | | | |
| *Abbreviations: CAU: care as usual; CES-D: Center for Epidemiological Studies Depression- scale; CI: confidence interval; CSC: clinical significant change; ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SE: standard error; SF-HLQ: Short Health and Labour Questionnaire; TiC-P: Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness; WHO-HPQ: WHO Health and Work Performance Questionnaire; WTP: willingness to pay* | | | | | | |
| a. Both the intervention and control group were free to seek any additional (mental) health care. | | | | | | |
| b. Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness (TiC-P) is a self-reported questionnaire that was used to collect healthcare utilisation data and ability to perform domestic tasks. Sickness absence was measured with the Short Health and Labour Questionnaire (SF-HLQ) and presenteeism was assessed with one item of the WHO Health and Work Performance Questionnaire (WHO-HPQ) | | | | | | |
| c. CES-D scores range from zero to 60 with higher scores indicating the presence of more depressive symptoms. | | | | | | |
| d. ROI was calculated as the total net benefit (from absenteeism, presenteeism and occupational health costs) divided by the intervention cost. | | | | | | |
| e. Converted by YHEC using historical exchange rates and PSSRU inflation indices. | | | | | | |

| Kahlke (2019) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Study type:** Randomised controlled trial (RCT) with cost-effectiveness (CEA) and cost-utility analysis (CUA) | **Perspective:** Societal perspective<br><br>**Time horizon:** 6 months<br><br>**Discounting:** NA | **Total cost per person [b]; mean, € (SD):** iSMI 5258 (5493) (=£4,965.32 in 2020 GBP) [d] | **Improvement in PSS score between pre- and 6-month follow up; mean (SD):** iSMI 9.75 (6)<br><br>WLC | **ICER:** iSMI vs. WLC<br><br>iSMI dominates WLC (lower cost and better outcomes) for all 3 outcome measures (PSS-10, symptom- | **Author identified:** • Due to time horizon, long-term conclusion cannot be made • Self-reported costs and effects may had led to | **Source of funding:** Europena Union and the BARMER (German health insurance company)<br><br>**Further research:** |

| Kahlke (2019) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Country:**<br>Germany<br><br>**Population:**<br>Adults who were currently employed and had elevated perceived stress (score ≥ 22 on the perceived stress scale (PSS-10))<br><br>**Sample size:**<br>264<br><br>**Intervention:**<br>An internet-based stress management intervention (iSMI) that consists of 7 sessions of problem-solving and emotion-regulation techniques with 1 boost session 4 weeks after training completion<br><br>**Comparator(s):**<br>Waitlist control (WLC) with unrestricted access to treatment as usual | **Data sources Costs [a]:**<br>From RCT<br><br>**Effects:**<br>From RCT | WLC 5642 (6000) (=£5,327.94 in 2020 GBP) [d]<br><br>**Intervention cost per person; €:**<br>iSMI 299 (=£282.36 in 2020 GBP) [d]<br><br>WLC 0<br><br>**Currency & cost year:**<br>EUR (€); 2013 | 3.0 (6)<br><br>**% of participants with symptoms-free status at follow-up**<br>iSMI<br>59.8<br><br>WLC<br>23.5<br><br>**Total QALYs gained; mean (SD):**<br>iSMI<br>0.35 (0.04)<br><br>WLC<br>0.35 (0.35) | free status and QALYs)<br><br>**Uncertainty:**<br>There is a 70%, 70% and 69% probability that the iSMI dominates WLC for the 3 defined outcomes, respectively. Assuming a willing to pay (WTP) of €1000 and €3000 for gaining a symptom-free person, the intervention's probability rises to 85% and 97%, respectively. Assuming a WTP of €10,000 and €20,000 for 1 QALY gained, the probability rises to 73% and 76%, respectively. | social desirability and/or recall bias<br>• The majority of sample were female which limits the generalizability of study findings<br><br>**Reviewer identified:**<br>• Some minor inconsistencies in figures reported without clear explanation | • Long-term impact of the occupational mental health interventions<br>• CEA for employees with lower stress-levels<br>• Focus on the general German working population regarding recruitment, implementation, and dissemination |

| Kahlke (2019) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| | | | | | | |
| **Overall applicability: Partly applicable** | | **Overall quality: Minor limitations** | | | | |
| *Abbreviations: CEA: cost-effectiveness analysis; CI: confidence interval; CUA: cost-utility analysis; ICER: incremental cost-effectiveness ratio; PSS: perceived stress scale; QALY: quality-adjusted life year; SD: standard deviation; TiC-P: Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness* | | | | | | |
| a. Patient and family costs were estimated based on self-reported data. Productivity loss costs were estimated based on Trimbos Institute and Institute of Medical Technology Questionnaire for Costs Associated with Psychiatric Illness (TiC-P) which is a self-reported questionnaire. | | | | | | |
| b. Total costs were the health care costs, patient and family costs and productively losses (absenteeism, presenteeism). | | | | | | |
| c. Symptom-free status was measured using the perceived stress scale (PPS-10). Symptom-free status was achieved when a participant scored > 2 standard deviations below then mean PPS-10 at baseline. | | | | | | |
| d. Converted by YHEC using historical exchange rates and PSSRU inflation indices. | | | | | | |

| Phillips (2014) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| **Study type:**<br>A randomised controlled trial (RCT) with cost-effectiveness analysis (CEA)<br><br>**Country:**<br>UK<br><br>**Population:**<br>Employees aged over 18 that met the following criterion:<br>scored 2 or more on 5 of the 9 items | **Perspective:**<br>The perspective is not clearly stated. A societal perspective is assumed.<br><br>**Time horizon:**<br>12-weeks (6-week follow-up marks the end of the intervention)<br><br>**Discounting:**<br>NA<br><br>**Data sources Costs:** | **Total cost per person at 6-weeks [a]; mean, £ (SD):**<br>MoodGYM<br>125 (451) (=£148.54 in 2020 GBP) [c]<br><br>Control<br>149 (908) (=£177.06 in 2020 GBP) [c]<br><br>**Intervention cost per person; £:**<br>MoodGYM is a freely available course developed at Australia National University [b] | **Total QALYs gained at 6-weeks:**<br>MoodGYM<br>0.082<br><br>Control<br>0.083<br><br>**Total QALYs gained at 12-weeks:**<br>MoodGYM<br>0.170<br><br>Control<br>0.167 | **ICER:**<br>Not reported<br><br>At 6-week follow-up, MoodGYM resulted in slightly lowers costs and a slightly lower QALY gain<br><br>**Uncertainty:**<br>Not reported | **Author identified:**<br>• Retention rates were low (56% at 6 weeks, 36% at 12 weeks) likely due to the study been online with no face-to-face interactions between participants and the research team<br>• Short follow-up period | **Source of funding:**<br>The British Occupational Health Research Foundation<br><br>**Further research:**<br>• Successful uptake is fundamental, before effectiveness can be rigorously tested. More work is needed to streamline the |

| Phillips (2014) | | | | | | |
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| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| included on the Patient Health Questionnaire-9 (PHQ-9)<br><br>**Sample size:**<br>637<br><br>**Intervention:**<br>MoodGYM is an interactive computerized cognitive behavioural therapy to help improve employees' work-related performance and psychological well-being. It includes 5, 1 hour-long modules, usually taken weekly.<br><br>**Comparator:**<br>An 'attentional' control group who were sent weekly links to 5 websites with general information about mental health | From RCT; self-reported service usage and sickness absence data combined with unit costs (Curtis, 2010) and average earnings data<br><br>**Effects:**<br>From RCT | **Currency & cost year:**<br>GBP (£); 2010 | | | **Reviewer identified:**<br>• Author does not provide 12-week costs<br>• ICER were not calculated, likely due to the lack of difference in costs and QALYs gained | delivery of online resources. |
| | | | | | | |
| **Overall applicability: Partly applicable** | | **Overall quality: Minor limitations** | | | | |

| Phillips (2014) | | | | | | |
|---|---|---|---|---|---|---|
| **Study** | **Method of Analysis** | **Costs** | **Outcomes** | **Results** | **Limitations** | **Comments** |
| *Abbreviations: CEA: cost-effectiveness analysis; ICER: incremental cost-effectiveness ratio; PHQ-9: Patient Health Questionnaire-9; QALY: quality-adjusted life-year; RCT: randomised controlled trial* | | | | | | |
| a. Total costs were the costs associated with hospital services, community services and lost work. | | | | | | |
| b. Costs relating to the set-up and running (telephone and email prompts) of both the intervention and control were not included. | | | | | | |
| c. Converted by YHEC using historical exchange rates and PSSRU inflation indices. | | | | | | |

# Appendix I – Health economic model

The model covers more than 1 review in the guideline and is contained in a separate document (see Evidence Review G].

# Appendix J – Excluded studies

## J.1 Effectiveness studies

| Study | Reason for exclusion |
|---|---|
| Abbott, J.-A.M., Kaldo, V., Klein, B. et al. (2009) A cluster randomised trial of an internet-based intervention program for tinnitus distress in an industrial setting. Cognitive Behaviour Therapy 38(3): 162-173 | - Study population had a clinical diagnosis |
| Allwang, Christine, Marten-Mittag, Birgitt, Dinkel, Andreas et al. (2020) Effectiveness of a Brief Psychotherapeutic Intervention for Employees With Psychosomatic and Psychosocial Complaints-Pilot Study of a Consultation Off the Workplace. Frontiers in psychiatry 11: 00867 | - Study does not have a control group |
| Almen, Niclas Lisspers, Jan Ost, Lars-Goran Sundin, Orjan (2020) Behavioral Stress Recovery Management Intervention for People With High Levels of Perceived Stress: A Randomized Controlled Trial. INTERNATIONAL JOURNAL OF STRESS MANAGEMENT 27(2): 183-194 | - Study has no employer involvement |
| Arends, I, Almansa, J, Stansfeld, S A et al. (2019) One-year trajectories of mental health and work outcomes post return to work in patients with common mental disorders. Journal of affective disorders 257: 263-270 | - Study population had a clinical diagnosis |
| Arends, Iris, Bultmann, Ute, Nielsen, Karina et al. (2014) Process evaluation of a problem solving intervention to prevent recurrent sickness absence in workers with common mental disorders. Social science & medicine (1982) 100: 123-32 | - Study population had a clinical diagnosis |
| Arends, Iris, Bultmann, Ute, van Rhenen, Willem et al. (2013) Economic evaluation of a problem solving intervention to prevent recurrent sickness absence in workers with common mental disorders. PloS one 8(8): e71937 | - Study population had a clinical diagnosis |
| Arends, Iris, van der Klink, Jac J L, van Rhenen, Willem et al. (2014) Prevention of recurrent sickness absence in workers with common mental disorders: results of a cluster-randomised controlled trial. Occupational and environmental medicine 71(1): 21-9 | - Study population had a clinical diagnosis |
| Aust, Birgit; Peter, Richard; Siegrist, Johannes (1997) Stress Management in Bus Drivers: A Pilot Study Based on the Model of Effort?Reward Imbalance. International Journal of Stress Management 4(4): 297-305 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Baer, Ruth A. Carmody, James Hunsinger, Matthew (2012) Weekly Change in Mindfulness and Perceived Stress in a Mindfulness-Based Stress Reduction Program. JOURNAL OF CLINICAL PSYCHOLOGY 68(7): 755-765 | - Study does not have a control group |
| Bagheri, T, Fatemi, M J, Payandan, H et al. (2019) The effects of stress-coping strategies and group cognitive-behavioral therapy on nurse burnout. Annals of burns and fire disasters 32(3): 184-189 | - Study not conducted in an OECD / BRICS country |
| Barnes, Christopher M; Miller, Jared A; Bostock, Sophie (2017) Helping employees sleep well: Effects of cognitive behavioral therapy for insomnia on work outcomes. The Journal of applied psychology 102(1): 104-113 | - Study has no employer involvement |
| Bartlett, Larissa, Lovell, Pamela, Otahal, Petr et al. (2017) Acceptability, feasibility, and efficacy of a workplace mindfulness program for public sector employees: A pilot randomized controlled trial with informant reports. Mindfulness 8(3): 639-654 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |

| Study | Reason for exclusion |
|---|---|
| Biglan, Anthony, Layton, Georgia L, Jones, Laura Backen et al. (2013) The Value of Workshops on Psychological Flexibility for Early Childhood Special Education Staff. Topics in early childhood special education 32(4) | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Boezeman, Edwin J; Nieuwenhuijsen, Karen; Sluiter, Judith K (2018) An intervention that reduces stress in people who combine work with informal care: randomized controlled trial results. European journal of public health 28(3): 485-489 | - Study has no employer involvement |
| Braun, Lina, Titzler, Ingrid, Terhorst, Yannik et al. (2021) Effectiveness of guided internet-based interventions in the indicated prevention of depression in green professions (PROD-A): Results of a pragmatic randomized controlled trial. Journal of affective disorders 278: 658-671 | - Study has no employer involvement |
| Brouwers, E, Tiemens, B, Terluin, B et al. (2007) Effectiveness of an intervention to reduce sickness absenteeism from work in patients with emotional distress or minor mental disorders: a randomised controlled effectiveness trial. Huisarts en wetenschap 50(6): 238-244 | - Full-text is not in English |
| Buntrock, Claudia, Ebert, David, Lehr, Dirk et al. (2015) Effectiveness of a web-based cognitive behavioural intervention for subthreshold depression: pragmatic randomised controlled trial. Psychotherapy and psychosomatics 84(6): 348-58 | - Study has no employer involvement |
| Carneiro, Elida Mara, Oliveira, Livia Figueira Avezum, da Silva, Djalma Alexandre Alves et al. (2020) Effects of the laying on of hands on anxiety, stress and autonomic response of employees in a hospital: A double-blind randomized controlled trial. Complementary therapies in medicine 52: 102475 | - Study does not provide data in a usable format |
| Carolan, Stephany; Harris, Peter R; Cavanagh, Kate (2017) Improving Employee Well-Being and Effectiveness: Systematic Review and Meta-Analysis of Web-Based Psychological Interventions Delivered in the Workplace. Journal of medical Internet research 19(7): e271 | - Systematic review - references to be checked |
| Chaukos, Deanna, Chad-Friedman, Emma, Mehta, Darshan H et al. (2017) Risk and Resilience Factors Associated with Resident Burnout. Academic psychiatry : the journal of the American Association of Directors of Psychiatric Residency Training and the Association for Academic Psychiatry 41(2): 189-194 | - Study is not an intervention study |
| Chen, Huei-Mein; Wang, Hsiu-Hung; Chiu, Min-Hui (2016) Effectiveness of a Releasing Exercise Program on Anxiety and Self-Efficacy Among Nurses. Western journal of nursing research 38(2): 169-82 | - Study not conducted in an OECD / BRICS country |
| Chesak, Sherry S, Bhagra, Anjali, Cutshall, Susanne et al. (2020) Authentic Connections Groups: A Pilot Test of an Intervention Aimed at Enhancing Resilience Among Nurse Leader Mothers. Worldviews on evidence-based nursing 17(1): 39-48 | - Study intervention is not an intervention targeted at individuals |
| Chopp-Hurley, Jaclyn N, Brenneman, Elora C, Wiebenga, Emily G et al. (2017) Randomized controlled trial investigating the role of exercise in the workplace to improve work ability, performance, and patient-reported symptoms among older workers with osteoarthritis. Journal of Occupational and Environmental Medicine 59(6): 550-556 | - Study population had a clinical diagnosis |
| Cooley, Kieran, Szczurko, Orest, Perri, Dan et al. (2009) Naturopathic care for anxiety: a randomized controlled trial ISRCTN78958974. PloS one 4(8): e6628 | - Study population had a clinical diagnosis |
| de Boer, A. G. E. M. Burdorf, A. van Duivenbooden, C. Frings-Dresen, M. H. W. (2007) The effect of individual counselling and education on work ability and disability pension: a prospective intervention study in | - Study is not concerned with mental wellbeing |

| Study | Reason for exclusion |
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| the construction industry. OCCUPATIONAL AND ENVIRONMENTAL MEDICINE 64(12): 792-797 | |
| de Bruin, Esther I, Formsma, Anne R, Frijstein, Gerard et al. (2017) Mindful2Work: Effects of Combined Physical Exercise, Yoga, and Mindfulness Meditations for Stress Relieve in Employees. A Proof of Concept Study. Mindfulness 8(1): 204-217 | - Study does not have a control group |
| de Bruin, Esther I, Valentin, Simon, Baartmans, Jeanine M D et al. (2020) Mindful2Work the next steps: Effectiveness of a program combining physical exercise, yoga and mindfulness, adding a wait-list period, measurements up to one year later and qualitative interviews. Complementary therapies in clinical practice 39: 101137 | - Study does not have a control group |
| de Vries, Juriena D, van Hooff, Madelon Lm, Guerts, Sabine Ae et al. (2017) Exercise to reduce work-related fatigue among employees: a randomized controlled trial. Scandinavian journal of work, environment & health 43(4): 337-349 | - Study has no employer involvement |
| Deady, M, Johnston, D A, Glozier, N et al. (2018) A smartphone application for treating depressive symptoms: study protocol for a randomised controlled trial. BMC psychiatry 18(1): 166 | - Protocol only |
| Del Pozo-Cruz, Borja, Adsuar, Jose C, Parraca, Jose et al. (2012) A web-based intervention to improve and prevent low back pain among office workers: a randomized controlled trial. The Journal of orthopaedic and sports physical therapy 42(10): 831-41 | - Study is not concerned with mental wellbeing |
| Diaz-Rodriguez, L., Arroyo-Morales, M., Fernandez-de-las-Penas, C. et al. (2011) Immediate effects of reiki on heart rate variability, cortisol levels, and body temperature in health care professionals with burnout. Biological Research for Nursing 13(4): 376-382 | - Study population had a clinical diagnosis |
| do Prado, Juliana Miyuki Sato Kurebayashi, Leonice Fumiko Paes da Silva, Maria Julia (2012) Efficacy of auriculotherapy for the reduction of stress in nursing students: a randomized clinical trial. REVISTA LATINO-AMERICANA DE ENFERMAGEM 20(4): 727-735 | - Study population is not in employment |
| Duhoux, Arnaud, Menear, Matthew, Charron, Maude et al. (2017) Interventions to promote or improve the mental health of primary care nurses: a systematic review. Journal of nursing management 25(8): 597-607 | - Systematic review - references to be checked |
| Ebert, D.D., Buntrock, C., Lehr, D. et al. (2018) Effectiveness of Web- and Mobile-Based Treatment of Subthreshold Depression With Adherence-Focused Guidance: A Single-Blind Randomized Controlled Trial. Behavior Therapy 49(1): 71-83 | - Study has no employer involvement |
| Eklund, C., Elfstrom, M.L., Eriksson, Y. et al. (2019) User experiences from a web-based, self-management programme: struggling with what I need when stress management is about me. European Journal of Physiotherapy 21(1): 39-48 | - Qualitative study conducted outside UK |
| El Khamali, Radia, Mouaci, Atika, Valera, Sabine et al. (2018) Effects of a multimodal program including simulation on job strain among nurses working in intensive care units: A randomized clinical trial. JAMA: Journal of the American Medical Association 320(19): 1988-1997 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Errazuriz, Antonia, Schmidt, Kristin, Undurraga, Eduardo A et al. (2020) Effects of mindfulness-based stress reduction on psychological distress in health workers: A three-arm parallel randomized controlled trial. Journal of psychiatric research | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |

| Study | Reason for exclusion |
|---|---|
| Flaxman, Paul E and Bond, Frank W (2010) Worksite stress management training: moderated effects and clinical significance. Journal of occupational health psychology 15(4): 347-58 | - Overview of three RCTs |
| Flaxman, Paul E and Bond, Frank W (2010) A randomised worksite comparison of acceptance and commitment therapy and stress inoculation training. Behaviour research and therapy 48(8): 816-20 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Freitas, Anderson Rodrigues, Carneseca, Estela Cristina, Paiva, Carlos Eduardo et al. (2014) Impact of a physical activity program on the anxiety, depression, occupational stress and burnout syndrome of nursing professionals. Revista latino-americana de enfermagem 22(2): 332-6 | - Study does not have a control group |
| Gartner, F.R., Nieuwenhuijsen, K., Ketelaar, S.M. et al. (2013) The Mental Vitality @ Work Study: Effectiveness of a Mental Module for WorkersE Health Surveillance for Nurses and Allied Health Care Professionals on Their Help-Seeking Behavior. Journal of Occupational and Environmental Medicine 55(10): 1219-1229 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| George, D.R. (2011) Intergenerational volunteering and quality of life: mixed methods evaluation of a randomized control trial involving persons with mild to moderate dementia. Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation 20(7): 987-995 | - Study has no employer involvement |
| Gloster, Andrew T. Klotsche, Jens Aggeler, Tatiana Geisser, Noemi Juillerat, Gregory Schmidlin, Nicole Mueller-Siemens, Sophie Gaab, Jens (2019) Psychoneuroendocrine evaluation of an acceptance and commitment based stress management training. PSYCHOTHERAPY RESEARCH 29(4): 503-513 | - Study has no employer involvement |
| Griffin, Kristen H, Johnson, Jill R, Kitzmann, Jennifer P et al. (2015) Outcomes of a Multimodal Resilience Training Program in an Outpatient Integrative Medicine Clinic. Journal of alternative and complementary medicine (New York, N.Y.) 21(10): 628-37 | - Study does not have a control group |
| Gunasingam, Nishmi, Burns, Kharis, Edwards, James et al. (2015) Reducing stress and burnout in junior doctors: the impact of debriefing sessions. Postgraduate medical journal 91(1074): 182-7 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Haggman-Laitila, Arja and Romppanen, Johanna (2018) Outcomes of interventions for nurse leaders' well-being at work: A quantitative systematic review. Journal of advanced nursing 74(1): 34-44 | - Systematic review - references to be checked |
| Hahn, V.C., Binnewies, C., Sonnentag, S. et al. (2011) Learning How To Recover From Job Stress: Effects of a Recovery Training Program on Recovery, Recovery-Related Self-Efficacy, and Well-Being. Journal of Occupational Health Psychology 16(2): 202-216 | - Study has no employer involvement |
| Hammer, M; Pl?ssl, I; Hundsd?rfer, T (2007) A coping with Stress Training (SBT) for persons with mental illness--pilot study on a group training programme in support of occupational rehabilitation. Die rehabilitation 46(2): 102-110 | - Full-text is not in English |
| Hardy, Claire, Griffiths, Amanda, Norton, Sam et al. (2018) Self-help cognitive behavior therapy for working women with problematic hot flushes and night sweats (MENOS@Work): a multicenter randomized controlled trial. Menopause (New York, N.Y.) 25(5): 508-519 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Hatinen, Marja, Makikangas, Anne, Kinnunen, Ulla et al. (2013) Recovery from burnout during a one-year rehabilitation intervention | - Study does not have a control group |

| Study | Reason for exclusion |
|---|---|
| with six-month follow-up: Associations with coping strategies. International Journal of Stress Management 20(4): 364-390 | |
| Hirsch, Abigail, Luellen, Jason, Holder, Jared M et al. (2017) Managing Depressive Symptoms in the Workplace Using a Web-Based Self-Care Tool: A Pilot Randomized Controlled Trial. JMIR research protocols 6(4): e51 | - Study has an active control gruop |
| Holt, Jackie Del Mar, Chris (2006) Reducing occupational psychological distress: a randomized controlled trial of a mailed intervention. HEALTH EDUCATION RESEARCH 21(4): 501-507 | - Study conducted before 2007 |
| Hopman, Juliette A. B, van Lier, Pol A. C, van der Ende, Jan et al. (2018) Impact of the Good Behavior Game on special education teachers. Teachers and Teaching: Theory and Practice 24(4): 350-368 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Hsieh, Hsiu-Fen, Huang, I-Chin, Liu, Yi et al. (2020) The Effects of Biofeedback Training and Smartphone-Delivered Biofeedback Training on Resilience, Occupational Stress, and Depressive Symptoms among Abused Psychiatric Nurses. International journal of environmental research and public health 17(8) | - Study not conducted in an OECD / BRICS country |
| Hutting, Nathan, Staal, J Bart, Heerkens, Yvonne F et al. (2013) A self-management program for employees with complaints of the arm, neck, or shoulder (CANS): study protocol for a randomized controlled trial. Trials 14: 258 | - Study is not concerned with mental wellbeing |
| Imamura, Kotaro, Furukawa, Toshi A, Matsuyama, Yutaka et al. (2018) Differences in the Effect of Internet-Based Cognitive Behavioral Therapy for Improving Nonclinical Depressive Symptoms Among Workers by Time Preference: Randomized Controlled Trial. Journal of medical Internet research 20(8): e10231 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Imamura, Kotaro, Kawakami, Norito, Furukawa, Toshi A et al. (2015) Effects of an internet-based cognitive behavioural therapy intervention on preventing major depressive episodes among workers: a protocol for a randomised controlled trial. BMJ open 5(5): e007590 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Imamura, Kotaro, Kawakami, Norito, Furukawa, Toshi A et al. (2014) Effects of an Internet-based cognitive behavioral therapy (iCBT) program in Manga format on improving subthreshold depressive symptoms among healthy workers: a randomized controlled trial. PloS one 9(5): e97167 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Imamura, Kotaro, Kawakami, Norito, Furukawa, Toshi A et al. (2015) Effects of an internet-based cognitive behavioral therapy intervention on improving work engagement and other work-related outcomes: an analysis of secondary outcomes of a randomized controlled trial. Journal of occupational and environmental medicine 57(5): 578-84 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Imamura, Kotaro, Kawakami, Norito, Tsuno, Kanami et al. (2016) Effects of web-based stress and depression literacy intervention on improving symptoms and knowledge of depression among workers: A randomized controlled trial. Journal of affective disorders 203: 30-37 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Imamura, Kotaro, Kawakami, Norito, Tsuno, Kanami et al. (2017) Effects of web-based stress and depression literacy intervention on improving work engagement among workers with low work engagement: An analysis of secondary outcome of a randomized controlled trial. Journal of occupational health 59(1): 46-54 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |

| Study | Reason for exclusion |
|---|---|
| Isaksson Ro, K.E., Gude, T., Tyssen, R. et al. (2008) Counselling for burnout in Norwegian doctors: One year cohort study. BMJ 337(7679): 1146-1149 | - Study does not have a control group |
| Isaksson Ro, K.E., Gude, T., Tyssen, R. et al. (2008) Counselling for burnout in Norwegian doctors: One year cohort study. BMJ 337(7679): 1146-1149 | - Duplicate |
| Isaksson Ro, Karin E, Gude, Tore, Tyssen, Reidar et al. (2010) A self-referral preventive intervention for burnout among Norwegian nurses: one-year follow-up study. Patient education and counseling 78(2): 191-7 | - Study does not have a control group |
| Isaksson Ro, Karin E, Tyssen, Reidar, Hoffart, Asle et al. (2010) A three-year cohort study of the relationships between coping, job stress and burnout after a counselling intervention for help-seeking physicians. BMC public health 10: 213 | - Study does not have a control group |
| Jacquet, A., Grolleau, A., Jove, J. et al. (2015) Burnout: Evaluation of the efficacy and tolerability of TARGET 1 for professional fatigue syndrome (burnout)*. Journal of International Medical Research 43(1): 54-66 | - Study is concerned with dietary supplements |
| Jain, Shamini Shapiro, Shauna L. Swanick, Summer Roesch, Scott C. Mills, Paul J. Bell, Iris Schwartz, Gary E. R. (2007) A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. ANNALS OF BEHAVIORAL MEDICINE 33(1): 11-21 | - Study population is not in employment |
| Janka, A, Adler, C, Brunner, B et al. (2017) Biofeedback Training in Crisis Managers: A Randomized Controlled Trial. Applied psychophysiology and biofeedback 42(2): 117-125 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Jansen, Kate L (2011) Coping, stress, and burnout factors in long-term volunteering. Dissertation Abstracts International: Section B: The Sciences and Engineering 71(10b): 6440 | - Dissertation |
| Jarvela-Reijonen, Elina Puttonen, Sampsa Karhunen, Leila Sairanen, Essi Laitinen, Jaana Kolehmainen, Mikko Pihlajamaki, Jussi Kujala, Urho M. Korpela, Riitta Ermes, Miikka Lappalainen, Raimo Kolehmainen, Marjukka (2020) The Effects of Acceptance and Commitment Therapy (ACT) Intervention on Inflammation and Stress Biomarkers: a Randomized Controlled Trial. INTERNATIONAL JOURNAL OF BEHAVIORAL MEDICINE 27(5): 539-555 | - Study has no employer involvement |
| Jay, Kenneth, Brandt, Mikkel, Hansen, Klaus et al. (2015) Effect of Individually Tailored Biopsychosocial Workplace Interventions on Chronic Musculoskeletal Pain and Stress Among Laboratory Technicians: Randomized Controlled Trial. Pain physician 18(5): 459-71 | - Study is not concerned with mental wellbeing |
| Jonas, Benjamin; Leuschner, Fabian; Tossmann, Peter (2017) Efficacy of an internet-based intervention for burnout: a randomized controlled trial in the German working population. Anxiety, stress, and coping 30(2): 133-144 | - Study has no employer involvement |
| Jonassaint, C.R., Belnap, B.H., Huang, Y. et al. (2019) Racial Differences in the Effectiveness of Internet-Delivered Mental Health Care. Journal of General Internal Medicine | - Study has no employer involvement |
| Kang, HJ and Bang, KS (2017) Development and Evaluation of a Self-Reflection Program for Intensive Care Unit Nurses Who Have Experienced the Death of Pediatric Patients. Journal of korean academy of nursing 47(3): 392-405 | - Full-text is not in English |

| Study | Reason for exclusion |
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| Kant, Ijmert, Jansen, Nicole W H, van Amelsvoort, Ludovic G P M et al. (2008) Structured early consultation with the occupational physician reduces sickness absence among office workers at high risk for long-term sickness absence: a randomized controlled trial. Journal of occupational rehabilitation 18(1): 79-86 | - Study intervention is not an intervention targeted at individuals |
| Kaplan, Veysel and Ancel, Gulsum (2020) The effect of interpersonal relational role analysis on nursing students' anxiety levels and interpersonal problem-solving orientation. Perspectives in psychiatric care | - Study population is not in employment |
| Kaspereen, Dana (2012) Relaxation intervention for stress reduction among teachers and staff. International Journal of Stress Management 19(3): 238-250 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Kilfedder, Catherine Power, Kevin Karatzias, Thanos McCafferty, Aileen Niven, Karen Chouliara, Zoe Galloway, Lisa Sharp, Stephen (2010) A randomized trial of face-to-face counselling versus telephone counselling versus bibliotherapy for occupational stress. PSYCHOLOGY AND PSYCHOTHERAPY-THEORY RESEARCH AND PRACTICE 83(3): 223-242 | - Study has an active control gruop |
| Kim, Chun-Ja, Schlenk, Elizabeth A, Kang, Se-Won et al. (2015) Effects of an internet-based lifestyle intervention on cardio-metabolic risks and stress in Korean workers with metabolic syndrome: a controlled trial. Patient education and counseling 98(1): 111-9 | - Study is not concerned with mental wellbeing |
| Kim, Young In, Kim, Sun Mi, Kim, Hyungjin et al. (2016) The Effect of High-Frequency Repetitive Transcranial Magnetic Stimulation on Occupational Stress among Health Care Workers: A Pilot Study. Psychiatry investigation 13(6): 622-629 | - Study intervention is hospital-based transcranial managetic stimulation |
| Koncz, Rebecca, Wolfenden, Fiona, Hassed, Craig et al. (2016) Mindfulness-based stress release program for university employees: A pilot, waitlist-controlled trial and implementation replication. Journal of Occupational and Environmental Medicine 58(10): 1021-1027 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Konradt, Udo, Heblich, Frank, Krys, Sabrina et al. (2019) Beneficial, adverse, and spiraling health-promotion effects: Evidence from a longitudinal randomized controlled trial of working at sit-stand desks. Journal of occupational health psychology | - Study is not concerned with mental wellbeing |
| Kouvonen, Anne, Manty, Minna, Harkko, Jaakko et al. (2019) Effectiveness of internet-delivered cognitive behavioural therapy in reducing sickness absence among young employees with depressive symptoms: study protocol for a large-scale pragmatic randomised controlled trial. BMJ open 9(10): e032119 | - Protocol only |
| Kratzke, Ian M, Campbell, Alana, Yefimov, Mae N et al. (2021) Pilot Study Using Neurofeedback as a Tool to Reduce Surgical Resident Burnout. Journal of the American College of Surgeons 232(1): 74-80 | - Study was not retrieved |
| Kurebayashi, Leonice Fumiko and da Silva, Maria Julia Paes (2014) Efficacy of Chinese auriculotlierapy for stress in nursing staff: A randomized clinical trial. Revista Latino-Americana de Enfermagem 22(3): 731-738 | - Duplicate |
| Kyllonen, Heidi Maria, Muotka, Joona, Puolakanaho, Anne et al. (2018) A brief Acceptance and Commitment Therapy intervention for depression: A randomized controlled trial with 3-year follow-up for the intervention group. Journal of Contextual Behavioral Science 10: 55-63 | - Study population had a clinical diagnosis |
| Lacaze, Denise Helena de Castro, Sacco, Isabel de C N, Rocha, Lys Esther et al. (2010) Stretching and joint mobilization exercises reduce | - Study is not concerned with mental wellbeing |

| Study | Reason for exclusion |
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| call-center operators' musculoskeletal discomfort and fatigue. Clinics (Sao Paulo, Brazil) 65(7): 657-62 | |
| Lantieri, Linda, Kyse, Eden Nagler, Harnett, Susanne et al. (2011) Building inner resilience in teachers and students. Personality, stress, and coping: Implications for education.: 267-292 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Lappalainen, Paivi, Kaipainen, Kirsikka, Lappalainen, Raimo et al. (2013) Feasibility of a Personal Health Technology-Based Psychological Intervention for Men with Stress and Mood Problems: Randomized Controlled Pilot Trial. Journal of Medical Internet Research 15(1) | - Study has no employer involvement |
| Lebares, C.C., Guvva, E.V., Desai, A. et al. (2019) Key factors for implementing mindfulness-based burnout interventions in surgery. American Journal of Surgery | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Lee, SM and Sung, KM (2017) The Effects of Violence Coping Program Based on Middle-Range Theory of Resilience on Emergency Room Nurses' Resilience, Violence Coping, Nursing Competency and Burnout. Journal of korean academy of nursing 47(3): 332-344 | - Full-text is not in English |
| Lemaire, Jane B, Wallace, Jean E, Lewin, Adriane M et al. (2011) The effect of a biofeedback-based stress management tool on physician stress: a randomized controlled clinical trial. Open medicine : a peer-reviewed, independent, open-access journal 5(4): e154-63 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Lennefer, Thomas, Lopper, Elisa, Wiedemann, Amelie U et al. (2019) Improving employees' work-related well-being and physical health through a technology-based physical activity intervention: A randomized intervention-control group study. Journal of occupational health psychology | - Study is not concerned with mental wellbeing |
| Lerner, D, Adler, D, Hermann, RC et al. (2012) Impact of a work-focused intervention on the productivity and symptoms of employees with depression. Journal of occupational and environmental medicine / American College of Occupational and Environmental Medicine 54(2): 128-35 | - Study population had a clinical diagnosis |
| Lerner, Debra, Adler, David A, Rogers, William H et al. (2015) A randomized clinical trial of a telephone depression intervention to reduce employee presenteeism and absenteeism. Psychiatric services (Washington, D.C.) 66(6): 570-7 | - Study population had a clinical diagnosis |
| Li, H.-C., Wang, L.S., Lin, Y.-H. et al. (2011) The effect of a peer-mentoring strategy on student nurse stress reduction in clinical practice. International Nursing Review 58(2): 203-210 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Lopez, Lara, Smit, Filip, Cuijpers, Pim et al. (2019) Problem-solving intervention to prevent depression in non-professional caregivers: a randomized controlled trial with 8 years of follow-up. Psychological medicine: 1-8 | - Study has no employer involvement |
| Lucke, Caroline, Braumandl, Sylvia, Becker, Bernhard et al. (2019) Effects of nature-based mindfulness training on resilience/symptom load in professionals with high work-related stress-levels: findings from the WIN-Study. Mental illness 11(2): 20-24 | - Study has no employer involvement |
| Mache, Stefanie, Bernburg, Monika, Baresi, Lisa et al. (2016) Evaluation of self-care skills training and solution-focused counselling | - Study population is not selected for poor mental |

| Study | Reason for exclusion |
|---|---|
| for health professionals in psychiatric medicine: a pilot study. International journal of psychiatry in clinical practice 20(4): 239-44 | wellbeing or for being at risk of poor mental wellbeing |
| 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 and complementary medicine (New York, N.Y.) 9(3): 355-369 | - Study is not concerned with mental wellbeing |
| McGarry, Sarah, Girdler, Sonya, McDonald, Ann et al. (2013) Paediatric health-care professionals: relationships between psychological distress, resilience and coping skills. Journal of paediatrics and child health 49(9): 725-32 | - Study is not an intervention study |
| McGonagle, Alyssa K. Beatty, Joy E. Joffe, Rosalind (2014) Coaching for Workers With Chronic Illness: Evaluating an Intervention. JOURNAL OF OCCUPATIONAL HEALTH PSYCHOLOGY 19(3): 385-398 | - Study has no employer involvement |
| Mehta, Darshan H, Perez, Giselle K, Traeger, Lara et al. (2016) Building Resiliency in a Palliative Care Team: A Pilot Study. Journal of pain and symptom management 51(3): 604-8 | - Study does not have a control group |
| Melton, Larry Anfield, Robert Kane, Gail White, Nathan Young, Jeff Dunnington, Katie (2012) Reducing the Incidence of Short-Term Disability Testing the Effectiveness of an Absence Prediction and Prevention Intervention Using an Experimental Design. JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE 54(12): 1441-1446 | - Study is not concerned with mental wellbeing |
| Michailidis, Evie and Cropley, Mark (2019) Testing the benefits of expressive writing for workplace embitterment: A randomized control trial. European Journal of Work and Organizational Psychology 28(3): 315-328 | - Study has no employer involvement |
| Molek-Winiarska, Dorota and Zolnierczyk-Zreda, Dorota (2018) Application of mindfulness-based stress reduction to a stress management intervention in a study of a mining sector company. International journal of occupational safety and ergonomics : JOSE 24(4): 546-556 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Morris, Abigail S, Murphy, Rebecca C, Shepherd, Sam O et al. (2019) A multi-component intervention to sit less and move more in a contact centre setting: a feasibility study. BMC public health 19(1): 292 | - Study is not concerned with mental wellbeing |
| Netterstrom, Bo; Friebel, Lene; Ladegaard, Yun (2013) Effects of a multidisciplinary stress treatment programme on patient return to work rate and symptom reduction: results from a randomised, wait-list controlled trial. Psychotherapy and psychosomatics 82(3): 177-86 | - Study population were on sick leave |
| Nevill, R E and Havercamp, S M (2019) Effects of mindfulness, coping styles and resilience on job retention and burnout in caregivers supporting aggressive adults with developmental disabilities. Journal of intellectual disability research : JIDR 63(5): 441-453 | - Study is not an intervention study |
| Nickel, C, Tanca, S, Kolowos, S et al. (2007) Men with chronic occupational stress benefit from behavioural/psycho-educational group training: a randomized, prospective, controlled trial. Psychological medicine 37(8): 1141-9 | - Study has no employer involvement |
| Onuigbo, Liziana N; Onyishi, Charity N; Eseadi, Chiedu (2020) Clinical benefits of rational-emotive stress management therapy for job burnout and dysfunctional distress of special education teachers. World journal of clinical cases 8(12): 2438-2447 | - Overview of rational-emotive therapy |
| Orth-Gomer, K Eriksson, I Moser, V Theorell, T Fredlund, P (1994) Lipid lowering through work stress reduction. International journal of behavioral medicine 1(3): 204-14 | - Study conducted before 2007 |

| Study | Reason for exclusion |
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| Oude Hengel, Karen M Joling, Catelijne I Proper, Karin I van der Molen, Henk F Bongers, Paulien M (2011) Intervention Mapping as a framework for developing an intervention at the worksite for older construction workers. American journal of health promotion : AJHP 26(1): e1-10 | - Study does not have a control group |
| Overland, Simon; Grasdal, Astrid Louise; Reme, Silje Endresen (2018) Long-term effects on income and sickness benefits after work-focused cognitive-behavioural therapy and individual job support: a pragmatic, multicentre, randomised controlled trial. Occupational and environmental medicine 75(10): 703-708 | - Study population were on sick leave |
| Persson Asplund, Robert, Dagoo, Jesper, Fjellstrom, Ida et al. (2018) Internet-based stress management for distressed managers: results from a randomised controlled trial. Occupational and environmental medicine 75(2): 105-113 | - Study population had a clinical diagnosis |
| Phillips, Elena A; Gordeev, Vladimir S; Schreyogg, Jonas (2019) Effectiveness of occupational e-mental health interventions: a systematic review and meta-analysis of randomized controlled trials. Scandinavian journal of work, environment & health 45(6): 560-576 | - Systematic review - references to be checked |
| Pidd, Ken; Roche, Ann; Fischer, Jane (2015) A recipe for good mental health: A pilot randomised controlled trial of a psychological wellbeing and substance use intervention targeting young chefs. Drugs: Education, Prevention & Policy 22(4): 352-361 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Proudfoot, J, Clarke, J, Birch, MR et al. (2013) Impact of a mobile phone and web program on symptom and functional outcomes for people with mild-to-moderate depression, anxiety and stress: a randomised controlled trial. BMC psychiatry 13: 312 | - Study has no employer involvement |
| Puolakanaho, Anne Tolvanen, Asko Kinnunen, Sanna M. Lappalainen, Raimo (2020) A psychological flexibility -based intervention for Burnout:A randomized controlled trial. JOURNAL OF CONTEXTUAL BEHAVIORAL SCIENCE 15: 52-67 | - Study has no employer involvement |
| Querstret, Dawn; Cropley, Mark; Fife-Schaw, Chris (2017) Internet-based instructor-led mindfulness for work-related rumination, fatigue, and sleep: Assessing facets of mindfulness as mechanisms of change. A randomized waitlist control trial. Journal of occupational health psychology 22(2): 153-169 | - Study has no employer involvement |
| Raiskila, Tero, Blanco Sequeiros, Sanna, Kiuttu, Jorma et al. (2013) The Impact of an Early Eclectic Rehabilitative Intervention on Symptoms in First Episode Depression among Employed People. Depression research and treatment 2013: 926562 | - Study population had a clinical diagnosis |
| Ricou, B., Gigon, F., Durand-Steiner, E. et al. (2018) Initiative for Burnout of ICU Caregivers: Feasibility and Preliminary Results of a Psychological Support. Journal of Intensive Care Medicine | - Study intervention is not an intervention targeted at individuals |
| Ro, Karin E Isaksson, Gude, Tore, Tyssen, Reidar et al. (2008) Counselling for burnout in Norwegian doctors: one year cohort study. BMJ (Clinical research ed.) 337: a2004 | - Duplicate |
| Romppanen, Johanna and Haggman-Laitila, Arja (2017) Interventions for nurses' well-being at work: a quantitative systematic review. Journal of advanced nursing 73(7): 1555-1569 | - Systematic review - references to be checked |
| Rose, Raphael D. Buckey, Jay C., Jr. Zbozinek, Tomislav D. Motivala, Sarosh J. Glenn, Daniel E. Cartreine, James A. Craske, Michelle G. (2013) A randomized controlled trial of a self-guided, multimedia, stress management and resilience training program. BEHAVIOUR RESEARCH AND THERAPY 51(2): 106-112 | - Study population is not in employment |

| Study | Reason for exclusion |
|---|---|
| Ruwaard, Jeroen, Lange, Alfred, Bouwman, Manon et al. (2007) E-mailed standardized cognitive behavioural treatment of work-related stress: a randomized controlled trial. Cognitive behaviour therapy 36(3): 179-92 | - Study has no employer involvement |
| Saelid GA (2016) Evaluation of the Coping with Strain course in workplaces: A four-year longitudinal randomized controlled trial. | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Saelid, Gry Anette, Czajkowski, Nikolai Olavi, Holte, Arne et al. (2016) Coping With Strain (CWS) course - its effects on depressive symptoms: A four-year longitudinal randomized controlled trial. Scandinavian journal of psychology 57(4): 321-7 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Salmela-Aro, K Naatanen, P Nurmi, JE (2004) The role of work-related personal projects during two burnout interventions: a longitudinal study. WORK AND STRESS 18(3): 208-230 | - Study conducted before 2007 |
| Saltychev, Mikhail, Laimi, Katri, Oksanen, Tuula et al. (2012) Effect of a multidisciplinary rehabilitation programme on perceived health among employees at increased risk of incapacity for work: a controlled study. Clinical rehabilitation 26(6): 513-22 | - Study intervention includes an inpatient component |
| Schnaider-Levi, Lia, Ganz, Ariel B, Zafrani, Keren et al. (2020) The Effect of Inquiry-Based Stress Reduction on Teacher Burnout: A Controlled Trial. Brain sciences 10(7) | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Schnieder, S., Stappert, S., Takahashi, M. et al. (2013) Sustainable reduction of sleepiness through salutogenic self-care procedure in lunch breaks: A pilot study. Evidence-based Complementary and Alternative Medicine 2013: 387356 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Schwantes, M.; McKinney, C.; Hannibal, N. (2014) Music therapy's effects on levels of depression, anxiety, and social isolation in Mexican farmworkers living in the United States: A randomized controlled trial. Arts in Psychotherapy 41(1): 120-126 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Seiferling, Nadine Michel, Alexandra (2017) Building Resources for Retirement Transition: Effects of a Resource-Oriented Group Intervention on Retirement Cognitions and Emotions. WORK AGING AND RETIREMENT 3(4): 325-342 | - Study has no employer involvement |
| Sekar, L., Niva, W.J., Maheshkumar, K. et al. (2019) Effect of mahamantra chanting on autonomic and cognitive functions- An interventional study. Journal of Clinical and Diagnostic Research 13(5): cc05-cc09 | - Study does not report on outcomes of interest |
| Skoglund, L., Josephson, M., Wahlstedt, K. et al. (2011) Qigong training and effects on stress, neck-shoulder pain and life quality in a computerised office environment. Complementary Therapies in Clinical Practice 17(1): 54-57 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Sook, Lee? Byoung and ??? ???, ??? (2010) Effects of the Mentoring Program as a Strategy for Retention of Clinical Nurses. Journal of Korean Academy of Nursing AdministrationS1 ??????? 16(1): 48-58 | - Full-text is not in English |
| Staechele, Tobias Domes, Gregor Wekenborg, Magdalena Penz, Marlene Kirschbaum, Clemens Heinrichs, Markus (2020) Effects of a 6-Week Internet-Based Stress Management Program on Perceived | - Study has no employer involvement |

| Study | Reason for exclusion |
|---|---|
| Stress, Subjective Coping Skills, and Sleep Quality. FRONTIERS IN PSYCHIATRY 11 | |
| Stafford-Brown, Johanna and Pakenham, Kenneth I (2012) The effectiveness of an ACT informed intervention for managing stress and improving therapist qualities in clinical psychology trainees. Journal of clinical psychology 68(6): 592-13 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Steensma, Herman; Den Heijer, Monique; Stallen, Valerie Research note: effects of resilience training on the reduction of stress and depression among Dutch workers. International quarterly of community health education 27(2): 145-59 | - Majority of study population were on sick leave |
| Stenlund, Therese, Birgander, Lisbeth Slunga, Lindahl, Bernt et al. (2009) Effects of Qigong in patients with burnout: a randomized controlled trial. Journal of rehabilitation medicine 41(9): 761-7 | - Study population had a clinical diagnosis |
| Stier-Jarmer, Marita, Oberhauser, Cornelia, Frisch, Dieter et al. (2020) A Multimodal Stress-Prevention Program Supplemented by Telephone-Coaching Sessions to Reduce Perceived Stress among German Farmers: Results from a Randomized Controlled Trial. International journal of environmental research and public health 17(24) | - Study population had a clinical diagnosis |
| Supiano, Katherine P and Overfelt, Vicki Kennedy (2018) Honoring grief, honoring ourselves: Mindfulness-based stress reduction education for grief group clinician-facilitators. Social Work in Mental Health 16(1): 62-73 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Suzuki, Etsuji, Tsuchiya, Masao, Hirokawa, Kumi et al. (2008) Evaluation of an internet-based self-help program for better quality of sleep among Japanese workers: a randomized controlled trial. Journal of occupational health 50(5): 387-99 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Taren, Adrienne A, Gianaros, Peter J, Greco, Carol M et al. (2017) Mindfulness Meditation Training and Executive Control Network Resting State Functional Connectivity: A Randomized Controlled Trial. Psychosomatic medicine 79(6): 674-683 | - Study population is not in employment |
| Telle, Nils-Torge, Moock, Jorn, Heuchert, Sandra et al. (2016) Job Maintenance through Supported Employment PLUS: A Randomized Controlled Trial. Frontiers in public health 4: 194 | - Study has no employer involvement |
| Thiart, H., Ebert, D.D., Lehr, D. et al. (2016) Internet-based cognitive behavioral therapy for insomnia: A health economic evaluation. Sleep 39(10): 1769-1778 | - Study population had a clinical diagnosis |
| Thiart, Hanne, Lehr, Dirk, Ebert, David Daniel et al. (2015) Log in and breathe out: internet-based recovery training for sleepless employees with work-related strain - results of a randomized controlled trial. Scandinavian journal of work, environment & health 41(2): 164-74 | - Study population had a clinical diagnosis |
| Thiart, Hanne, Lehr, Dirk, Ebert, David Daniel et al. (2013) Log in and breathe out: efficacy and cost-effectiveness of an online sleep training for teachers affected by work-related strain--study protocol for a randomized controlled trial. Trials 14: 169 | - Study population had a clinical diagnosis |
| Thimmapuram, Jayaram, Pargament, Robert, Sibliss, Kedesha et al. (2017) Effect of heartfulness meditation on burnout, emotional wellness, and telomere length in health care professionals. Journal of community hospital internal medicine perspectives 7(1): 21-27 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Van Rhenen, W, Blonk, RW, van der Klink, JJ et al. (2005) The effect of a cognitive and a physical stress-reducing programme on psychological | - Study does not have a control group |

| Study | Reason for exclusion |
|---|---|
| complaints. International archives of occupational and environmental health 78(2): 139-148 | |
| van Vilsteren, M, Boot, C R L, Twisk, J W R et al. (2017) One Year Effects of a Workplace Integrated Care Intervention for Workers with Rheumatoid Arthritis: Results of a Randomized Controlled Trial. Journal of occupational rehabilitation 27(1): 128-136 | - Study has no employer involvement |
| van Vilsteren, Myrthe, Boot, Cecile R L, Twisk, Jos W R et al. (2017) Effectiveness of an integrated care intervention on supervisor support and work functioning of workers with rheumatoid arthritis. Disability and rehabilitation 39(4): 354-362 | - Study has no employer involvement |
| Vanajan, Anushiya Stier-Jarmer, Marita Ivandic, Ivana Schuh, Angela Sabariego, Carla (2020) Can Participants' Characteristics Predict Benefit from a Multimodal Burnout Prevention Program? Secondary Analysis of a Randomized Controlled Trial Conducted in Germany. BEHAVIORAL MEDICINE 46(2): 120-129 | - Study does not provide data in a usable format |
| Versluis, Anke, Verkuil, Bart, Spinhoven, Philip et al. (2018) Effectiveness of a smartphone-based worry-reduction training for stress reduction: A randomized-controlled trial. Psychology & health 33(9): 1079-1099 | - Study has no employer involvement |
| Walker, B.L. and Harrington, S.S. (2013) The effects of restorative care training on caregiver job satisfaction. Journal for nurses in professional development 29(2): 73-78 | - Study does not have a control group |
| Wang, JianLi, Patten, Scott B, Lam, Raymond W et al. (2016) The Effects of an E-Mental Health Program and Job Coaching on the Risk of Major Depression and Productivity in Canadian Male Workers: Protocol for a Randomized Controlled Trial. JMIR research protocols 5(4): e218 | - Protocol only |
| Wang, Philip S, Simon, Gregory E, Avorn, Jerry et al. (2007) Telephone screening, outreach, and care management for depressed workers and impact on clinical and work productivity outcomes: a randomized controlled trial. JAMA 298(12): 1401-11 | - Study population had a clinical diagnosis |
| Waters, Cerith S, Frude, Neil, Flaxman, Paul E et al. (2018) Acceptance and commitment therapy (ACT) for clinically distressed health care workers: Waitlist-controlled evaluation of an ACT workshop in a routine practice setting. The British journal of clinical psychology 57(1): 82-98 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Wegner, Ralf, Berger, Peter, Poschadel, Bernd et al. (2011) Burnout hazard in teachers results of a clinical-psychological intervention study. Journal of occupational medicine and toxicology (London, England) 6(1): 37 | - Study does not have a control group |
| Wiegand, Benjamin Luedtke, Kathryn Friscia, Diana Nair, Mona Aleles, Margaret McCloskey, Richard (2010) Efficacy of a comprehensive program for reducing stress in women: A prospective, randomized trial. CURRENT MEDICAL RESEARCH AND OPINION 26(4): 991-1002 | - Study has no employer involvement |
| Wijnen, Ben F M, Lokkerbol, Joran, Boot, Cecile et al. (2019) Implementing interventions to reduce work-related stress among health-care workers: an investment appraisal from the employer's perspective. International archives of occupational and environmental health | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Willert, Morten Vejs; Thulstrup, Ane Marie; Hertz, Janne (2009) Changes in stress and coping from a randomized controlled trial of a three-month stress management intervention. Scandinavian journal of work, environment & health 35(2): 145-52 | - Majority of study population were on sick leave |

| Study | Reason for exclusion |
|---|---|
| Wolever RQ, Bobinet KJ, McCabe K et al. (2012) Effective and viable mind-body stress reduction in the workplace: a randomized controlled trial. Journal of occupational health psychology 17(2): 246-258 | - Study does not provide data in a usable format |
| Xie, Caixia, Zeng, Yanli, Lv, Yu et al. (2020) Educational intervention versus mindfulness-based intervention for ICU nurses with occupational burnout: A parallel, controlled trial. Complementary therapies in medicine 52: 102485 | - Study has an active control gruop |
| Xu, Wenxin, Ceng, Mengjuan, Yao, Jiwei et al. (2017) Influence of the Exercise-psychology Adjustment Mode on the Mental Health of Medical Workers. Iranian journal of public health 46(6): 782-791 | - Study population is not selected for poor mental wellbeing or for being at risk of poor mental wellbeing |
| Yamamoto, M., Sasaki, N., Somemura, H. et al. (2016) Efficacy of sleep education program based on principles of cognitive behavioral therapy to alleviate workers' distress. Sleep and Biological Rhythms 14(2): 211-219 | - Study population had a clinical diagnosis |

## J.2 Economic studies

| Reference | Reason for exclusion |
|---|---|
| Adams A, Hollingsworth A, Osman A. The Implementation of a Cultural Change Toolkit to Reduce Nursing Burnout and Mitigate Nurse Turnover in the Emergency Department. Journal of emergency nursing: JEN : official publication of the Emergency Department Nurses Association. 2019;45(4):452-6. | No economic evaluation |
| Allen D, Carlson D, Ham C. Well-being: new paradigms of wellness--inspiring positive health outcomes and renewing hope. American journal of health promotion : AJHP. 2007;21(3):1-iii. | No economic evaluation |
| Anderson P, Jane-Llopis E. Mental health and global well-being. Health promotion international. 2011;26 Suppl 1:i147-55. | No economic evaluation |
| Anger WK, Elliot DL, Bodner T, Olson R, Rohlman DS, Truxillo DM, et al. Effectiveness of total worker health interventions. Journal of occupational health psychology. 2015;20(2):226-47. | Review |
| Anonymous. Care managers affect worker productivity. Disease management advisor. 2007;13(12):133-7. | No economic evaluation |
| Battams S, Roche AM, Fischer JA, Lee NK, Cameron J, Kostadinov V. Workplace risk factors for anxiety and depression in male-dominated industries: a systematic review. Health psychology and behavioral medicine. 2014;2(1):983-1008. | Review |
| Beekman ATF, van der Feltz-Cornelis C, van Marwijk HWJ. Enhanced care for depression. Current opinion in psychiatry. 2013;26(1):7-12. | Ineligible setting |
| Bender A, Farvolden P. Depression and the workplace: a progress report. Current psychiatry reports. 2008;10(1):73-9. | No economic evaluation |
| Bergerman L CPHC. Effectiveness of organizational interventions for the prevention of stress in the workplace. Edmonton: Institute of Health Economics (IHE). 2009. | Review |
| Brand SL, Thompson Coon J, Fleming LE, Carroll L, Bethel A, Wyatt K. Whole-system approaches to improving the health and wellbeing of healthcare workers: A systematic review. PloS one. 2017;12(12):e0188418. | Review |
| Brinkert R. A literature review of conflict communication causes, costs, benefits and interventions in nursing. Journal of nursing management. 2010;18(2):145-56. | Review |

| Reference | Reason for exclusion |
|---|---|
| Burke RJ, Richardsen AMe. Corporate Wellness Programs: Linking Employee and Organizational Health. 2014:380. | Review |
| Caloyeras JP, Liu H, Exum E, Broderick M, Mattke S. Managing manifest diseases, but not health risks, saved PepsiCo money over seven years. Health affairs (Project Hope). 2014;33(1):124-31. | Ineligible intervention |
| Casad BJ, Bryant WJ. Addressing Stereotype Threat is Critical to Diversity and Inclusion in Organizational Psychology. Frontiers in psychology. 2016;7:8. | Review |
| Cherniack M, Lahiri S. Barriers to implementation of workplace health interventions: An economic perspective. Journal of Occupational and Environmental Medicine. 2010;52(9):934-42. | Ineligible study design |
| Cherniack M. Integrated health programs, health outcomes, and return on investment: measuring workplace health promotion and integrated program effectiveness. Journal of occupational and environmental medicine. 2013;55(12 Suppl):S38-45. | Review |
| Dewa CS, Hoch JS. When could a stigma program to address mental illness in the workplace break even? Canadian journal of psychiatry Revue canadienne de psychiatrie. 2014;59(10 Suppl 1):S34-9. | Ineligible outcomes |
| Donohue JM, Pincus HA. Reducing the societal burden of depression: a review of economic costs, quality of care and effects of treatment. PharmacoEconomics. 2007;25(1):7-24. | Review |
| Dwivedi UC, Kumari S, Nagendra HR. Model of yoga intervention in industrial organizational psychology for counterproductive work behavior. Industrial psychiatry journal. 2015;24(2):119-24. | No economic evaluation |
| Ebert DD, Heber E, Berking M, Riper H, Cuijpers P, Funk B, et al. Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial. Occupational and environmental medicine. 2016;73(5):315-23. | No economic evaluation |
| Embree JL, Swenty CF, Schaar G. A Balanced Scorecard With Strategy Map: Measuring the Value of a Nursing Sabbatical. Journal of nursing care quality. 2015;30(4):352-8. | No economic evaluation |
| Furlan AD, Gnam WH, Carnide N, Irvin E, Amick BC, 3rd, DeRango K, et al. Systematic review of intervention practices for depression in the workplace. Journal of occupational rehabilitation. 2012;22(3):312-21. | Review |
| Geraedts AS, Fokkema M, Kleiboer AM, Smit F, Wiezer NW, Majo MC, et al. The longitudinal prediction of costs due to health care uptake and productivity losses in a cohort of employees with and without depression or anxiety. Journal of occupational and environmental medicine. 2014;56(8):794-801. | No economic evaluation |
| Goetzel RZ, Ozminkowski RJ. The health and cost benefits of work site health-promotion programs. Annual review of public health. 2008;29:303-23. | Review |
| Goetzel RZ, Tabrizi M, Henke RM, Benevent R, Brockbank CVS, Stinson K, et al. Estimating the return on investment from a health risk management program offered to small Colorado-based employers. Journal of occupational and environmental medicine. 2014;56(5):554-60. | Ineligible intervention |
| Grossmeier J, Terry PE, Anderson DR, Wright S. Financial impact of population health management programs: reevaluating the literature. Population health management. 2012;15(3):129-34. | Review |
| Guimaraes LBdM, Ribeiro JLD, Renner JS. Cost-benefit analysis of a socio-technical intervention in a Brazilian footwear company. Applied ergonomics. 2012;43(5):948-57. | Ineligible intervention |
| Hamberg-van Reenen HH, Proper KI, van den Berg M. Worksite mental health interventions: a systematic review of economic evaluations. Occupational and environmental medicine. 2012;69(11):837-45. | Review |
| Horwitz JR, Kelly BD, DiNardo JE. Wellness incentives in the workplace: Cost savings through cost shifting to unhealthy workers. Health Affairs. 2013;32(3):468-76. | Review |

| Reference | Reason for exclusion |
|---|---|
| Husk K, Blockley K, Lovell R, Bethel A, Lang I, Byng R, et al. What approaches to social prescribing work, for whom, and in what circumstances? A realist review. Health & social care in the community. 2019. | Review |
| Jacob V, Chattopadhyay SK, Sipe TA, Thota AB, Byard GJ, Chapman DP. Economics of collaborative care for management of depressive disorders: A community guide systematic review. American Journal of Preventive Medicine. 2012;42(5):539-49. | Review |
| Jayewardene WP, Lohrmann DK, Erbe RG, Torabi MR. Effects of preventive online mindfulness interventions on stress and mindfulness: A meta-analysis of randomized controlled trials. Preventive medicine reports. 2017;5:150-9. | No economic evaluation |
| Kaspin LC, Gorman KM, Miller RM. Systematic review of employer-sponsored wellness strategies and their economic and health-related outcomes. Population health management. 2013;16(1):14-21. | Review |
| Krol M, Papenburg J, Koopmanschap M, Brouwer W. Do productivity costs matter?: the impact of including productivity costs on the incremental costs of interventions targeted at depressive disorders. PharmacoEconomics. 2011;29(7):601-19. | Review |
| Lavenberg Jg WK. Interventions to reduce stress among nurses caring for patients with sickle cell disease. Philadelphia: Center for Evidence-based Practice (CEP). 2014. | No economic evaluation |
| Lavenberg JGHSGD. Mindfulness-based stress reduction interventions for nurses. Philadelphia: Center for Evidence-based Practice (CEP). 2016. | No economic evaluation |
| Lee S, Blake H, Lloyd S. The price is right: Making workplace wellness financially sustainable. International Journal of Workplace Health Management. 2010;3(1):58-69. | Ineligible study design |
| Lerner D, Adler D, Hermann RC, Chang H, Ludman EJ, Greenhill A, et al. Impact of a work-focused intervention on the productivity and symptoms of employees with depression. Journal of occupational and environmental medicine. 2012;54(2):128-35. | Ineligible outcomes |
| Lutz N, Taeymans J, Ballmer C, Verhaeghe N, Clarys P, Deliens T. Cost-effectiveness and cost-benefit of worksite health promotion programs in Europe: a systematic review. European journal of public health. 2019;29(3):540-6. | Review |
| Magnavita N. Medical Surveillance, Continuous Health Promotion and a Participatory Intervention in a Small Company. International journal of environmental research and public health. 2018;15(4). | No economic evaluation |
| McDaid D, Park AL. Investing in mental health and well-being: findings from the DataPrev project. Health promotion international. 2011;26 Suppl 1:i108-39. | Review |
| Merrill RM, LeCheminant JD. Medical cost analysis of a school district worksite wellness program. Preventive Medicine Reports. 2016;3:159-65. | Ineligible outcomes |
| Munoz-Murillo A, Esteban E, Avila CC, Fheodoroff K, Haro JM, Leonardi M, et al. Furthering the evidence of the effectiveness of employment strategies for people with mental disorders in europe: A systematic review. International Journal of Environmental Research and Public Health. 2018;15(5):838. | Review |
| Musich S, McCalister T, Wang S, Hawkins K. An evaluation of the Well at Dell health management program: health risk change and financial return on investment. American journal of health promotion : AJHP. 2015;29(3):147-57. | Ineligible intervention |
| Naidu VV, Giblin E, Burke KM, Madan I. Delivery of cognitive behavioural therapy to workers: a systematic review. Occupational medicine (Oxford, England). 2016;66(2):112-7. | Review |
| Osilla KC, Van Busum K, Schnyer C, Larkin JW, Eibner C, Mattke S. Systematic review of the impact of worksite wellness programs. The American journal of managed care. 2012;18(2):e68-81. | Review |
| Palumbo MV, Wu G, Shaner-McRae H, Rambur B, McIntosh B. Tai Chi for older nurses: a workplace wellness pilot study. Applied nursing research : ANR. 2012;25(1):54-9. | No economic evaluation |
| Pelletier KR. A review and analysis of the clinical and cost-effectiveness studies of comprehensive health promotion and disease management programs at the | Review |

| Reference | Reason for exclusion |
|---|---|
| worksite: Update VII 2004-2008. Journal of Occupational and Environmental Medicine. 2009;51(7):822-37. | |
| Pieper C, Schroer S, Eilerts A-L. Evidence of Workplace Interventions-A Systematic Review of Systematic Reviews. International journal of environmental research and public health. 2019;16(19). | Review |
| Ploukou S, Panagopoulou E. Playing music improves well-being of oncology nurses. Applied nursing research : ANR. 2018;39:77-80. | No economic evaluation |
| Pomaki G, Franche R-L, Murray E, Khushrushahi N, Lampinen TM. Workplace-based work disability prevention interventions for workers with common mental health conditions: a review of the literature. Journal of occupational rehabilitation. 2012;22(2):182-95. | Review |
| Poscia A, Moscato U, La Milia DI, Milovanovic S, Stojanovic J, Borghini A, et al. Workplace health promotion for older workers: a systematic literature review. BMC health services research. 2016;16 Suppl 5:329. | Review |
| Raglio A, Oddone E, Morotti L, Khreiwesh Y, Zuddas C, Brusinelli J, et al. Music in the workplace: A narrative literature review of intervention studies. Journal of Complementary and Integrative Medicine. 2019:20170046. | Review |
| Rodgers M, Asaria M, Walker S, McMillan D, Lucock M, Harden M, et al. The clinical effectiveness and cost-effectiveness of low-intensity psychological interventions for the secondary prevention of relapse after depression: A systematic review. Health Technology Assessment. 2012;16(28):1-129. | Review |
| Serxner S, Alberti A, Weinberger S. Medical cost savings for participants and nonparticipants in health risk assessments, lifestyle management, disease management, depression management, and nurseline in a large financial services corporation. American journal of health promotion : AJHP. 2012;26(4):245-52. | Ineligible outcomes |
| Sjobom V, Marnetoft SU. A new model for vocational rehabilitation at an organizational level -- a pilot study with promising results. Work (Reading, Mass). 2008;30(2):99-105. | Ineligible outcomes |
| Steel J, Godderis L, Luyten J. Productivity estimation in economic evaluations of occupational health and safety interventions: a systematic review. Scandinavian journal of work, environment & health. 2018;44(5):458-74. | Review |
| The Swedish Council on Health Technology A. [Occupational exposures and symptoms of depression and burnout]. Stockholm: The Swedish Council on Health Technology Assessment (SBU). 2014. | No economic evaluation |
| van Dongen JM, Coffeng JK, van Wier MF, Boot CRL, Hendriksen IJM, van Mechelen W, et al. The cost-effectiveness and return-on-investment of a combined social and physical environmental intervention in office employees. Health education research. 2017;32(5):384-98. | Ineligible intervention |
| van Dongen JM, Strijk JE, Proper KI, van Wier MF, van Mechelen W, van Tulder MW, et al. A cost-effectiveness and return-on-investment analysis of a worksite vitality intervention among older hospital workers: results of a randomized controlled trial. Journal of occupational and environmental medicine. 2013;55(3):337-46. | Review |
| Verbeek J, Pulliainen M, Kankaanpaa E. A systematic review of occupational safety and health business cases. Scandinavian journal of work, environment & health. 2009;35(6):403-12. | Ineligible outcomes |
| von Thiele Schwarz U, Hasson H. Effects of worksite health interventions involving reduced work hours and physical exercise on sickness absence costs. Journal of occupational and environmental medicine. 2012;54(5):538-44. | No economic evaluation |
| Wang PS, Simon GE, Avorn J, Azocar F, Ludman EJ, McCulloch J, et al. Telephone screening, outreach, and care management for depressed workers and impact on clinical and work productivity outcomes: a randomized controlled trial. JAMA. 2007;298(12):1401-11. | Review |
| Wang PS, Simon GE, Kessler RC. Making the business case for enhanced depression care: the National Institute of Mental Health-harvard Work Outcomes | No economic evaluation |

| Reference | Reason for exclusion |
|---|---|
| Research and Cost-effectiveness Study. Journal of occupational and environmental medicine. 2008;50(4):468-75. | |

# Appendix K – Research recommendations – full details

## K.1.1 Research recommendation

What are the views of organisations about the benefits of investing in mental wellbeing?

### K.1.1.1 Why this is important.

The committee agreed that overall a supportive, inclusive work environment and climate is crucial for good mental wellbeing in the workforce. Social interactions, including those between managers and employees, play an important role in this. Having the right policies can help to create a supportive workplace environment and culture and help put in place ways to ensure that leadership is supportive and engaged, that there are effective peer support networks, and there is good organisational-wide mental health literacy. Organisations can also promote mental wellbeing interventions by reducing any potential barriers to using them and supporting employees to access them. This would embed the importance of mental wellbeing into the organisational culture. The committee noted that there was little evidence on the views of organisations about mental wellbeing.

### K.1.1.2 Rationale for research recommendation

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|---|---|
| Importance to 'patients' or the population | Poor mental wellbeing at work is a significant public and political concern. A supportive, inclusive work environment and climate is crucial for good mental wellbeing in the workforce. The committee noted that there was little evidence on the views of organisations about mental wellbeing. |
| Relevance to NICE guidance | Universal organisational approaches have been considered in this guideline and there is a lack of evidence on the views of organisation about mental wellbeing. |
| Relevance to the NHS | The outcome would increase understanding of mental wellbeing in organisations including the NHS and inform approaches to universal organisational approaches. |
| National priorities | High – outlined in the NHS long term plan |
| Current evidence base | Minimal evidence on the views of organisations about mental wellbeing |
| Equality considerations | None known |

### K.1.1.3 Modified SPIDER table

| | |
|---|---|
| Sample | • Everyone aged 16 years or older in full or part time employment.<br>• Employers from micro, small, medium and/or large organisation across private and public sector |
| Phenomenon of Interest | What are the views of organisations about mental wellbeing? |
| Study Design | • Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies containing relevant qualitative data |

| | |
|---|---|
| Evaluation | Views and experiences regarding the intervention of:<br>• employees receiving the interventions.<br>• those delivering the interventions.<br>• employers |
| Research type | Qualitative or mixed methods |

### K.1.2 Research recommendation

What are the specific needs of small and medium size enterprises (SMEs) in promoting mental wellbeing in the workplace, including organisational, targeted and individual level approaches?

#### K.1.2.1 Why this is important

The committee noted that a lot of the evidence was from larger organisations, and that small and medium enterprises (SMEs) are likely to have fewer resources to help them address mental wellbeing in the workplace, such as occupational health and human resource professionals. This is particularly important considering that SMEs employ 61% of all private sector employees in the UK. The committee also discussed that medium-sized organisations can have more in common with larger organisations compared with micro and small businesses. The committee also discussed that some interventions may not be feasible for smaller organisations, and further research is required to determine the specific needs of SMEs.

#### K.1.2.2 Rationale for research recommendation

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|---|---|
| Importance to 'patients' or the population | Poor mental wellbeing at work is a significant public and political concern. The committee noted the lack of evidence around the specific needs of SMEs to improve mental wellbeing at work. |
| Relevance to NICE guidance | Organisational, targeted, and individual-level interventions have been considered in this guideline. However, most of the evidence came from studies conducted in large organisations and there is a lack of evidence around interventions conducted in SMEs. |
| Relevance to the NHS | SMEs employ a large proportion of the UK population, and improving the mental wellbeing of employees in these organisations may reduce the burden placed on the NHS due to mental ill health. |
| National priorities | High - outlined in the NHS long term plan |
| Current evidence base | There is a lack of evidence around interventions conducted in SMEs |
| Equality considerations | None known |

#### K.1.2.3 Modified SPIDER table

| | |
|---|---|
| Sample | • Everyone aged 16 years or older in full or part time employment.<br>• Employees from micro, small, and medium organisations across private and public sector |

| | |
|---|---|
| Phenomenon of Interest | What are the specific needs of small and medium size enterprises (SMEs) in promoting mental wellbeing in the workplace? |
| Study Design | • Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies containing relevant qualitative data |
| Evaluation | Views and experiences of employers and employees regarding:<br>• Their specific needs around mental wellbeing<br>• Barriers and facilitators to implementing interventions |
| Research type | Qualitative or mixed methods |

### K.1.3 Research recommendation

What is the long-term effectiveness of universal individual-level interventions in SMEs?

#### K.1.3.1 Why this is important.

The committee saw evidence on a range of interventions that aimed to improve mental wellbeing in an unselected population. From the evidence, the committee agreed that mindfulness, meditation and yoga were most effective overall in reducing job stress and mental health symptoms and having a positive effect on employee mental wellbeing. The evidence showed that these interventions were effective either when delivered in a group or online. The committee decided that employees should be able to choose how the interventions are delivered. The committee noted that there was a lack evidence around the long-term effectiveness of these universal individual-level interventions when delivered in SMEs. This is particularly important considering that SMEs employ 61% of all private sector employees in the UK, and these organisations are likely to have fewer resources compared with larger organisations.

#### K.1.3.2 Rationale for research recommendation

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|---|---|
| Importance to 'patients' or the population | Poor mental wellbeing at work is a significant public and political concern. The committee noted the lack of evidence about the long-term effectiveness of universal individual-level interventions in SMEs. |
| Relevance to NICE guidance | Universal individual-level interventions have been considered in this guideline and there is a lack of evidence about the long-term effectiveness of universal individual-level interventions in SMEs. |
| Relevance to the NHS | The outcome would increase understanding of long-term effectiveness of universal individual-level interventions in SMEs, which may inform practices that improve mental wellbeing in a large proportion of the population and reduce the burden of mental ill health on the NHS. |
| National priorities | High – outlined in the NHS long term plan |
| Current evidence base | There is a lack of evidence about the long-term effectiveness of universal individual-level interventions in SMEs. |

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| Equality considerations | None known |

#### K.1.3.3 Modified PICO table

| | |
|---|---|
| Population | • Everyone aged 16 years or older in full or part time employment.<br>• Employers from micro, small, and medium organisations across private and public sector |
| Intervention | Universal individual-level interventions |
| Comparator | Usual care or no intervention |
| Outcome | Long-term effectiveness for micro, small, and medium organisation for outcomes including:<br>Employee outcomes:<br>• Any measure of mental wellbeing<br>• Job stress, burnout or fatigue<br>• Symptoms of mental health conditions such as depression, anxiety, insomnia<br>• Absenteeism<br>• Presenteeism<br>• Productivity<br>• Job satisfaction, engagement or motivation<br>• Quality of life<br>• Uptake of support services<br>Employer outcomes<br>• Productivity<br>• Absenteeism<br>• Presenteeism |
| Study design | • Quantitative<br>• Mixed methods |
| Timeframe | Long term |
| Additional information | None |

### K.1.4 Research recommendation

Which outcomes should be used in a core outcome set for research into workplace mental wellbeing?

#### K.1.4.1 Why this is important.

The committee agreed, based on their experience, that it is important for any interventions to be evaluated and monitored as part of an ongoing strategy of employee engagement, and that validated measures of wellbeing need to be part of this process. The committee noted that further research is needed to understand how data and outcomes could best be used to improve mental wellbeing in the workplace. In particular, research could investigate which outcomes would be useful in a core outcome set for research into workplace mental wellbeing.

#### K.1.4.2 Rationale for research recommendation

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| Importance to 'patients' or the population | Mental wellbeing in the workplace interventions should be evaluated and monitored as part of an ongoing strategy of employee engagement. Further research is needed to understand how data and outcomes could best be used to improve mental wellbeing in the workplace. |

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| Relevance to NICE guidance | The committee noted that research could investigate which outcomes would be useful in a core outcome set for research into workplace mental wellbeing. |
| Relevance to the NHS | The outcome would increase understanding of mental wellbeing in organisations including the NHS and inform approaches to research. |
| National priorities | High – outlined in the NHS long term plan |
| Current evidence base | An identified lack of a core outcome set for research into workplace mental wellbeing. |
| Equality considerations | None known |

#### K.1.4.3 Modified SPIDER table

| | |
|---|---|
| Sample | • Everyone aged 16 years or older in full or part time employment.<br>• Employers from micro, small, medium and/or large organisation across private and public sector |
| Phenomenon of Interest | Which outcomes should be used in a core outcome set for research into workplace mental wellbeing? |
| Study Design | • Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies containing relevant qualitative data |
| Evaluation | Views and experiences of researchers, employers and employees regarding:<br>• Core outcome sets<br>• Barriers and facilitators to detailed reporting on mental wellbeing in the workplace.<br>• What outcomes are important and why |
| Research type | Qualitative or mixed methods |

### K.1.5 Research recommendation

What are the key characteristics of an organisation and its employees that need to be included in reporting research into workplace mental wellbeing?

#### K.1.5.1 Why this is important.

The committee agreed, based on their experience, that it is important for any interventions to be evaluated and monitored as part of an ongoing strategy of employee engagement, and that validated measures of wellbeing need to be part of this process. The committee noted that further research is needed to understand how data and outcomes could best be used to improve mental wellbeing in the workplace. In particular, research is required to understand what the key characteristics of an organisation and its employees are that need to be included in reporting research into workplace mental wellbeing.

#### K.1.5.2 Rationale for research recommendation

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|---|---|
| Importance to 'patients' or the population | Mental wellbeing in the workplace interventions should be evaluated and monitored as part of an |

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| | ongoing strategy of employee engagement. Further research is needed to understand how data and outcomes could best be used to improve mental wellbeing in the workplace. |
| Relevance to NICE guidance | The committee noted that research is required understand what the key characteristics of an organisation and its employees are that need to be included in reporting research into workplace mental wellbeing. |
| Relevance to the NHS | The outcome would increase understanding of mental wellbeing in organisations including the NHS and inform approaches to research. |
| National priorities | High – outlined in the NHS long term plan |
| Current evidence base | An identified lack of detailed reporting of the nature of an organisation and its employees regarding workplace mental wellbeing. |
| Equality considerations | None known |

#### K.1.5.3 Modified SPIDER table

| | |
|---|---|
| Sample | • Everyone aged 16 years or older in full or part time employment.<br>• Employers from micro, small, medium and/or large organisation across private and public sector |
| Phenomenon of Interest | What are the key characteristics of an organisation and its employees that need to be included in reporting research into workplace mental wellbeing?? |
| Study Design | • Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies containing relevant qualitative data |
| Evaluation | Views and experiences of researchers, employers and employees regarding:<br>• Core outcome sets<br>• Barriers and facilitators to detailed reporting on mental wellbeing in the workplace.<br>• What outcomes are important and why |
| Research type | Qualitative or mixed methods |

### K.1.6 Research recommendation

What are the specific needs of employees from different groups (such as income levels, ethnic groups, male/female groups, and age groups) to facilitate access to individual-level interventions, and how effective are individual-level interventions across these groups?

#### K.1.6.1 Why this is important.

The committee saw evidence on a range of interventions that aimed to improve mental wellbeing in an unselected population. From the evidence, the committee agreed that mindfulness, meditation and yoga were most effective overall in reducing job stress and mental health symptoms and having a positive effect on employee mental wellbeing. The

committee discussed that employees from some groups may face difficulties in accessing or participating in interventions. The committee discussed that access to online interventions would be affected by digital exclusion, and that this would disproportionately affect individuals from lower socioeconomic groups. The committee discussed the additional needs of employees who may face language barriers, such as migrants; or employees who would need other forms of adaptation, for example, individuals who are hard of hearing. The committee discussed that there may be a gender divide related to yoga participation and that this should be considered as a barrier to wider participation. In addition, the committee noted that some interventions may be less suitable for certain communities or cultures, and that interventions should be developed that work for these groups.

#### K.1.6.2 Rationale for research recommendation

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|---|---|
| Importance to 'patients' or the population | Poor mental wellbeing at work is a significant public and political concern. The committee noted the lack of evidence around the effectiveness of universal individual-level interventions across different groups of employees. It is important for interventions to be accessible and effective for all groups to ensure that inequalities are not widened |
| Relevance to NICE guidance | Universal individual-level interventions have been considered in this guideline and there is a lack of evidence around how effective these are in different groups. |
| Relevance to the NHS | The outcome would increase understanding of long-term effectiveness of universal individual-level interventions for all groups of employees in organisations including the NHS. |
| National priorities | High – outlined in the NHS long term plan |
| Current evidence base | There is a lack of evidence about the effectiveness of universal individual-level interventions across different groups, as well as the specific needs of different groups. |
| Equality considerations | This research recommendations seeks to understand factors that might impact equality of access this may include:<br>• access to online interventions and digital exclusion which may disproportionately affect individuals from lower socioeconomic groups.<br>• the needs of employees who may face language barriers, such as migrants.<br>• the needs of employees who would need other forms of adaptation, for example, individuals who are hard of hearing.<br>• the appeal of certain interventions to certain groups for example there may be a gender divide related to yoga participation which may be a barrier to wider participation.<br>• the suitability of interventions for certain communities or cultures.<br>• population groups sharing the 'protected characteristics' defined in the Equality Act.<br>Any research in this area must ensure that current inequalities of access are not increased. A clear rationale underpinning the focus of the |

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| | research and consideration of these through an equality impact assessment should be undertaken. |

### K.1.6.3 Modified PICO table

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|---|---|
| Population | • Employees over 16 sub-grouped by age, gender, family ancestry and other population groups sharing the 'protected characteristics' defined in the Equality Act. |
| Intervention | Universal individual-level interventions |
| Comparator | Usual care or no intervention |
| Outcome | Effectiveness for outcomes including:<br>Employee outcomes:<br>• Any measure of mental wellbeing<br>• Job stress, burnout or fatigue<br>• Symptoms of mental health conditions such as depression, anxiety, insomnia<br>• Absenteeism<br>• Presenteeism<br>• Productivity<br>• Job satisfaction, engagement or motivation<br>• Quality of life<br>• Uptake of support services<br>Employer outcomes<br>• Productivity<br>• Absenteeism<br>• Presenteeism |
| Study design | • Quantitative<br>• Mixed methods |
| Timeframe | Any |
| Additional information | None |

### K.1.6.4 Modified SPIDER table

| | |
|---|---|
| Sample | • Employees aged 16 years or older in full or part time employment.<br>• Employees from different<br>  ○ income levels<br>  ○ ethnic groups<br>  ○ male/female groups<br>  ○ age groups |
| Phenomenon of Interest | What are the specific needs of employees from different groups |
| Study Design | • Studies with a qualitative component including focus groups and interview-based studies.<br>• Mixed-methods studies containing relevant qualitative data |
| Evaluation | Views and experiences of employers and employees regarding:<br>• Their specific needs around mental wellbeing<br>• Barriers and facilitators to participating in interventions |
| Research type | Qualitative or mixed methods |