National Institute for Health and Care Excellence

Final

Mental wellbeing at work

Evidence review C: Targeted organisational-level approaches

NICE guideline NG212

Evidence reviews underpinning recommendations 1.2.1 to 1.2.4, 1.3.2, 1.4.5, 1.4.7, 1.7.2, 1.8.1, 1.8.2, 1.8.4 and research recommendations in the NICE guideline

March 2022

Final version

These evidence reviews were developed by Public Health Internal Guideline development team

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ISBN: 978-1-4731-4458-3

Contents

1 Targeted organisational-level approaches to prevent, improve, promote mental wellbeing at work 7
1.1 Review questions 7
1.1.1 Introduction 7
1.1.2 Summary of the protocol 7
1.1.3 Methods and process 9
1.1.4 Evidence identification 9
1.1.5 Summary of studies included in the effectiveness evidence. 10
1.1.6 Summary of studies included in the qualitative evidence 15
1.1.7 Economic evidence 15
1.1.8 Summary of included economic evidence 16
1.1.9 Economic model 18
1.1.10 Summary of the quality of the evidence 19
1.1.11 The committee's discussion and interpretation of the evidence 27
1.1.12 Recommendations supported by this evidence review 31
1.1.13 References – included studies 32
Appendices 33
Appendix A – Review protocols 33
Appendix B – Literature search strategies 49
Appendix C – Effectiveness evidence study selection 54
Appendix D – Effectiveness evidence 55
D.1 Chesak, 2020 55
D.2 Farzanfar 2011 69
D.3 Gartner 2013 77
D.4 Kant 2008 87
D.5 Kawakami 1997 93
D.6 Luthar 2017 99
D.7 Ricou, 2018 105
D.8 Peterson 2008 116
D.9 Rothermund 2016 122
Appendix E – Forest plots 129
E.1 Screening and intervention vs screening only 129
E.1.1 Mental wellbeing 129
E.1.2 Job stress 129
E.1.3 Mental health symptoms 129
E.1.4 Productivity 130
E.2 Screening and consultation vs screening only 130
E.2.1 Mental health symptoms 130

E.2.2 Uptake of support services 130
E.2.3 Productivity (number with impaired work functioning) 131
E.3 Screening and E-Mental health vs screening only 131
E.3.1 Job stress 131
E.3.2 Productivity (Number with impaired work functioning) 131
E.4 Structured early consultation vs usual care 132
E.4.1 Absenteeism 132
E.5 Workplace consultation vs outpatient consultation 132
E.5.1 Mental wellbeing 132
E.5.2 Job stress 132
E.5.3 Mental health symptoms 133
E.5.4 Productivity 133
E.6 Peer group vs no intervention 133
E.6.1 Job stress 133
E.6.2 Mental health symptoms 134
E.7 Stress reduction programme vs usual care 134
E.7.1 Job stress 134
E.7.2 Mental health symptoms 134
E.7.3 Absenteeism 135
E.8 Psychological support vs control 135
E.8.1 Job stress 135
E.8.2 Mental health symptoms 135
Appendix F - GRADE profiles 136
F.1.1 Screening and intervention vs screening only 136
F.1.2 Screening and consultation vs screening only 137
F.1.3 Screening and E-mental health vs screening only 137
F.1.4 Structured early consultation vs usual care 138
F.1.5 Workplace consultation vs outpatient consultation 138
F.1.6 Peer group vs no intervention 139
F.1.7 Authentic Connections group vs protected time 140
F.1.8 Stress reduction programme vs no intervention 140
F.1.9 Psychological support vs control 141
Appendix G – Economic evidence study selection 143
Appendix H - Economic evidence tables 144
Appendix I – Health economic model 149
Appendix J – Excluded studies and secondary studies 150
J.1 Excluded studies 150
J.2 Secondary publications 156
Appendix K Research recommendations – full details 158
K.1.1 Research recommendation 158

K.1.1.1 Why this is important. 158
K.1.1.2 Rationale for research recommendation 158
K.1.1.3 Modified PICO table 158

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

1.1 Review questions

RQ 3.1 What, organisational-level interventions, programmes, policies or strategies targeted to employees who experience or are identified as being at risk of poor mental wellbeing at work are effective and cost effective at:

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

RQ 3.2 For the following groups in relation to organisational-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:

- employees receiving them.
- employers.
- those delivering the interventions.

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 what organisational-level approaches, programmes, strategies or policies targeted to employees who experience or who are identified as being at risk of experiencing poor mental wellbeing at work are effective and cost-effective at:
  - Preventing poor mental wellbeing.
  - Promoting positive mental wellbeing.
  - Improving mental wellbeing.
- Understand the views and experiences of those employees, employers and those delivering the intervention.

1.1.2 Summary of the protocol

Table 1: PICO for targeted organisational level approaches

Population	**Quantitative and Qualitative** Employees who: • 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) **Qualitative** • Employers, managers • Those delivering them.
Intervention	**Quantitative and Qualitative** Organisational-level approaches delivered to a selected population in addition to usual practice that aims to (one or more of): • improve mental wellbeing. • promote positive mental wellbeing. • prevent poor mental wellbeing.
Comparator	**Quantitative** Usual practice (this may be called a control group or waiting list control group or other terms in the individual studies) **Qualitative** Not applicable
Outcomes	**Quantitative** • Any measure of mental wellbeing (using objective measures and/ or validated self-report measures) • Job stress, burnout or fatigue (using objective measures and/ or validated self-report measures) • Symptoms of mental health conditions such as depression, anxiety, insomnia (using validated self-report measures) • Absenteeism • Presenteeism • Productivity • Job satisfaction, engagement or motivation • Quality of life • Uptake of support services • Productivity • Absenteeism • Presenteeism • Patient and public safety • Employee retention • Methods and levels of employee consultation and participation • Incidence of discrimination, ill-treatment • De-stigmatisation • Adherence to mental wellbeing policies • Mental health literacy, such as knowledge and awareness about mental wellbeing • Unintended consequences or adverse effects **Qualitative** Themes based on views and experiences with the interventions of: • Employees receiving them • Employers • 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 and in the methods chapter for this guideline.. Methods specific to this review question are described in the review protocol in Appendix A.

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

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

Outcomes were divided in the following categories:

- Employee outcomes
- Employer 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.

1.1.4 Evidence identification

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,66 references were considered relevant for RQ3 based on title and abstract screening and were ordered.After the full text screening of these references, 14 were eligible for inclusion in the systematic review and 52 were excluded.

A total of 9 studies (reported in 14 papers) were included in this review for review question 3.1. Of these studies, 7 were randomised controlled trials (including 1 cluster RCT), and 2 were non-randomised studies. The characteristics of the 9 included studies are presented in Table 2 and a brief summary of the interventions presented in Table 3. No qualitative studies were identified for review question 3.2. See Appendix C for PRISMA diagram and Appendix D for full evidence tables.

1.1.4.2 Excluded studies

52 studies did not meet the inclusion criteria and therefore excluded from the review. 5 papers were secondary publications. See Appendix J for full reasons of exclusion and a list of the secondary publications.

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(s)
Chesak 2020 [USA]	RCT	Workplace • Public and private sector • Healthcare industry • Large enterprise	Employees (nursing education specialist or clinical nurse specialist) and a mother to at least one child or adult child	Intervention to facilitate authentic, mutually supportive relationships among women.	1hr per week of protected time reserved on their online work calendars for 12 weeks	**Employee outcomes** • Depression • Anxiety • Perceived stress • Burnout **Employer outcomes** • Not reported
Farzanfar 2011 [USA]	RCT	Workplace • Public and private sector • Healthcare industry • Large enterprise	Employees with some type of emotional distress with access to a touch-tone telephone	Telephone-Linked Communications Detect program	No intervention	**Employee outcomes** • Mental wellbeing • Job stress • Mental health symptoms • Productivity **Employer outcomes** • Not reported
Gartner 2013 [Netherlands]	Cluster RCT – 3 armed trial which are reported separately	Workplace • Public sector • Healthcare industry • Large enterprise	Employees who were not and not expected to be on sick leave (more than 2 weeks)	Workers' Health Surveillance module and intervention E-Mental health module	Waitlist control group	**Employee outcomes** • Resource use (intention to seek help) • Job stress • Mental health symptoms • Productivity **Employer outcomes** • Not reported
Kant 2008 [Netherlands]	RCT	Workplace • Private sector • Financial industry	Employees at high risk for future long-term sickness absence	Structured early consultation	Usual care	**Employee outcomes** • Absenteeism **Employer outcomes** • Not reported

Study (Country)	Study design	Setting	Population	Intervention	Comparator	Outcome(s)
		• Large enterprise				
Kawakami 1997 [Japan]	Non-RCT	Workplace • Private sector • Manufacturing industry • Large enterprise	Employees at worksites with employee mean depression scores higher than average for the company.	Work-related stress reduction intervention	No intervention	**Employee outcomes** • Job stress • Mental health symptoms • Absenteeism **Employer outcomes** • Not reported
Luthar 2017 [USA]	RCT	Workplace • Public sector • Healthcare industry • Large enterprise	Professional women at the Mayo clinic who had at least one child >18 years	Structured, relational supportive intervention	No intervention (received only protected time to be used as desired)	**Employee outcomes** • Mental wellbeing • Job stress • Mental health symptoms **Employer outcomes** • Not reported
Peterson 2008 [Sweden]	RCT	Workplace • Public sector • Services industry • Large enterprise	Employees of a country council scored above the 75th percentile in the exhaustion dimension questionnaire	A reflecting peer-support group	No intervention	**Employee outcomes** • Job stress • Mental health symptoms **Employer outcomes** • Not reported
Ricou 2018 [Switzerland]	RCT	Workplace • Sector - not reported • Industry – healthcare • Large organisation	Employees of a 36-bed medico surgical ICU of a university-affiliated hospital	Psychological intervention	Control – no further details	**Employee outcomes** • Burnout • Hospital Anxiety and Hospital Depression **Employer outcomes** Not reported
Rothermund 2016 [Germany]	Non-RCT	Workplace • No further details provided	367 employees seeking mental health support	Psychotherapeutic consultation in the workplace	Usual care (outpatient psychiatric care)	**Employee outcomes** • Mental wellbeing • Job stress • Mental health symptoms • Productivity

Study (Country)	Study design	Setting	Population	Intervention	Comparator	Outcome(s)
						Employer outcomes • Not reported

See Appendix D for full evidence tables.

Table 3: Summary of intervention characteristics

Brief name	Studies	Rational, theory or goal	Materials used	Procedures used	Provider	Delivery method	Intensity/ Duration
Supportive relationships	Chesak 2020	Facilitate authentic, mutually supportive relationships among women which then, come to serve as vital "protective factors" for the future, increasing women's resilience and reducing stress, burnout, and allostatic load.	Not reported	Intervention groups participated in small group sessions (1hr per week over 12 weeks), which were reserved on their online work calendars. Facilitated discussions centred on acknowledging and addressing stressors that professional mothers who are raising children face. Participants in the control group were provided 1hr per week of protected time reserved on their online work calendars for 12 weeks and were requested to not do any work-related activities during that hour.	Not reported	Small group face-to-face	1hr session per week for 12 weeks
(TLC) Detect system	Farzanfar 2011	To screen for undiagnosed and/or untreated mental health problems and help determine feasible self-management or professional care options	Workbooks	System included three modules: the screening module (receive assessment for mental health disorders), the intervention module (tailored information, education, and referrals for self-help or professional assistance), and the intervention follow-up module.	Telephone	Pre-recorded voice from a female actor	6 months

Brief name	Studies	Rational, theory or goal	Materials used	Procedures used	Provider	Delivery method	Intensity/ Duration
Workers' Health Surveillance module and intervention	Gartner 2013[a]	To assess whether intervention module stimulates help-seeking behaviour and improves work functioning and mental health	Not reported	Intervention include online screening, feedback based on screening questionnaire results and face to face consultation for positively screened workers.	Occupational physician	Online & face to face sessions	6 months
Workers' Health Surveillance module and E-Mental health module	Gartner 2013[a]	To assess whether intervention module stimulates help-seeking behaviour and improves work functioning and mental health	Not reported	Intervention include online screening, feedback based on screening questionnaire results and E-mental health intervention tailored to individual	Occupational physician	Online & face to face sessions	6 months
Structured early consultation	Kant 2008	A screening questionnaire, the so-called Balansmeter, was developed based on data of the Maastricht Cohort Study to identify employees at high risk of sickness absence.	Not reported	Employees received consultation. This consult may then result in a targeted intervention (focusing at the employee specific complaints)	Occupational Physician	Face to face consultation sessions	One to one and a halve hour, consultation
Stress reduction programme	Kawakami 1997	Aim to reduce work stress to prevent stress-related diseases and	Not reported	Range of steps to identify stressors, e.g. improvement to machinery, reduce worker checkpoints, job skills training	worksite supervisors, corporate medical staff (a mental health	Organisational environment intervention	1 year

[a] Gartner 2013 is a 3 arm trial and the two comparisons (Workers' Health Surveillance module and intervention vs. Waitlist control group; E-Mental health module vs. Waitlist control group) are presented separately.

Brief name	Studies	Rational, theory or goal	Materials used	Procedures used	Provider	Delivery method	Intensity/ Duration
		promoting worker health in industry			professional, an industrial physician, 3 public health nurses, 2 psychologists) and 3 of the personnel		
Authentic Connections Groups Program	Luthar 2017	Based on the structured Relational Psychotherapy Mothers' Groups and extended to professional women.	Participants received questionnaires to fill in.	Program includes topics, exercises, and no didactic sessions with guided discussions and role plays	female psychiatrist	5 Groups	12 -weekly- 1-hour sessions
Peer support group	Peterson 2008	A problem-based rehabilitation method used.	Manual with description & background of intervention	Peer support group providing discussion and reflection with colleagues and mutual support. Participants also worked on their individual goals for change	Group leaders (physicians, social workers, or psychotherapists)	8 groups with 5-8 participants	8 sessions each lasted 2 hours
Psychological support	Ricou 2018	Problem-based learning method for personnel empowerment in the workplace.	60-minute sessions moderated by 2 psychologists.	The general intervention framework consisted of a systemic intervention that is built on the following principles: allowing the group or the team to find its own definition of the problem and define the particular factors of exhaustion for the team itself.	Two Psychologists	Group discussions (5 to 6 participants increased to 8-10) moderated and planned by psychologists	60-minute sessions
Psycho-therapeutic consultation	Rothermund 2016	Short-term psychotherapeutic care	None	Session for assessment and session of next therapeutic steps and signposting to further support	Medical or psychological psychotherapist	Individual	Up to 4 sessions

1.1.6 Summary of studies included in the qualitative evidence

No qualitative studies were identified

1.1.7 Economic evidence

A guideline wide search of published cost-effectiveness evidence was carried out for review questions (RQ) 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, 2 studies were assessed as meeting the eligibility criteria for RQ 3. Both reviewers assessed all the full texts. The level of agreement between the two reviewers was 100%. For RQ 3, 2 studies were included.

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

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Noben (2014) Two interventions aiming to promote work functioning to reduce mental health complaints, both after an initial questionnaire: Occupational Physician (OP) visit or e-Mental Health training [a] vs. no intervention after initial questionnaire	Minor limitations [b]	Partly applicable [c]	The study conducted a pragmatic cluster randomised controlled trial with cost-utility analysis over a 6-month time horizon and from a societal perspective. Effectiveness of the intervention was measured as work functioning [e].	**Incremental intervention cost per person; mean, €:** OP vs. control 73.11 e-Mental Health vs. control Not reported **Incremental total costs per person; € [d]:** OP vs. control - 486 (=-£487.29 in 2020 GBP) [h] e-Mental health vs. control - 377 (=-£378 in 2020 GBP) [h] *CALCULATED BY YHEC BASED ON AVAILABLE FIGURES* [f] OP vs. e-Mental health - 109	**Incremental work functioning effectiveness [e]:** *CALCULATED BY YHEC BASED ON AVAILABLE FIGURES* [f] OP vs. control 0.04 e-Mental health vs. control -0.04 OP vs. e-Mental health 0.08	**Incremental cost effectiveness ratios (ICERs); €:** OP vs control Dominant (less costly and more effective for work functioning) e-Mental health vs. control 4054 per one-point increase in work functioning [g] *CALCULATED BY YHEC BASED ON AVAILABLE FIGURES* [f] OP dominates e-Mental health (OP was less costly and more effective for work functioning)	75% of the 5000 bootstrap replications of the ICER were dominant for the OP group, and 76% were in the south-west quadrant for the e-Mental Health group (less costly but less effective). The results were similar in both alternative scenarios, which differed the imputation technique.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	

Abbreviations: ICER: incremental cost-effectiveness ratio; OP: occupational physician;

a. Interventions were randomized before the questionnaire
b. The trial had a short time-horizon and limited deterministic sensitivity analyses were performed. Some effects, such as turnover, are not included.
c. 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.
d. Total costs were direct medical costs like service use and medication, indirect non-medical costs like absenteeism and presenteeism, and direct non-medical costs.
e. The primary outcome was 'work functioning', as measured on the following subscales of the 'Nurses Work Functioning Questionnaire': Cognitive aspects of task execution, Causing incidents at work, Avoidance behaviour, Conflicts and irritations with colleagues, Impaired contact with patients and their family, Lack of energy and Motivation. The difference between the interventions was examined as the percentage of individuals who improved by at least 40% in the follow-up questionnaire. Hence an incremental score of 0.04 meant that 4% more nurses improved their work functioning by at least 40% in the OP intervention versus the control.
f. Calculations performed by YHEC are unadjusted using figures from the base-case scenario.
g. While e-Mental health was less effective than the control it, also resulted in lower costs from reduced presenteeism and absenteeism. As it was cost-saving at a higher rate than it was less effective, it had a positive ICER and can be imagined as in the South East quadrant of the cost effectiveness plane
h. Converted by YHEC using historical exchange rates and PSSRU inflation indices.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Noben (2015) An initial screening questionnaire [a] (Workers' Health Surveillance instrument (WHS)) combined with an occupational physician occupational physician (OP) visit aiming to reduce mental health complaints	Minor limitations [b]	Partly applicable [c]	The study conducted a pragmatic cluster randomised controlled trial with return on investment (ROI) analysis, over a 6-month time horizon and from an employer's perspective. The benefits from the intervention were related to the increased productivity levels due to decreased	**Incremental intervention cost per person; mean, € (95% CI):** Intervention vs. control 64 (52 to 76) **Costs averted per person; €:** Intervention vs. control Absenteeism 308 (=£308.82 in 2020 GBP) Presenteeism	Not reported	**Net benefits per person; € (95% CI):** Intervention vs. control 651 (167 to 1,135) **Return on investment [d]; €:** Control -3 per euro invested Intervention 7 per euro invested	The incremental intervention cost difference and incremental total cost savings were both statistically significant (p<0.001 and p=0.004 respectively), as was the incremental net benefit (p=0.008). When the productivity gains were lowered by

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
vs. usual care			presenteeism and absenteeism.	407 (=£408.08 in 2020 GBP)		Incremental 11 per euro invested [e]	30%, the incremental ROI was still €8 per €1 invested. When 'hard to quantify' presenteeism benefits were ignored, the ROI was still €5 per euro invested.

Abbreviations: ICER: incremental cost-effectiveness ratio; OP: occupational physician; QALY: quality-adjusted life year; ROI: return on investment; WHS: Workers' Health Surveillance;

a. The initial screening questionnaire was given to all participant. Those in the intervention group received personalised feedback and the OP intervention if screened-positive, whereas those in the control group did not receive feedback nor any intervention even if they had screened-positive.

b. The trial had a short time-horizon that may not have captured the full effects of the intervention. Probabilistic sensitivity analysis was limited although confidence intervals were reported. Some direct effects like staff turnover and the spill-over effect of absenteeism were not included.

c. 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.

d. ROI was calculated total costs averted (due to the reduced absenteeism and presenteeism) divided by the intervention cost.

e. For the incremental ROI, the cost of the questionnaire in the control group is considered even though it is not usual care. It must be highlighted that the main result from this study is the ROI of the intervention group, €7 per euro invested (reviewer comment).

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 evidence

1.1.10.1 Effectiveness evidence

Screening and intervention vs screening only

See Forest plots Screening and intervention vs screening only: E1.1 to E1.4 129and GRADE profile F.1.1

Screening and intervention compared to screening only for interventions						
Patient or population: patients with interventions **Settings:** **Intervention:** Screening and intervention **Comparison:** screening only						
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				
	Screening only	**Screening and intervention**				
Mental wellbeing		The mean mental wellbeing in the intervention groups was **0.43 standard deviations lower** (0.75 to 0.1 lower)[6]		152 (1 study)	⊕⊕⊕⊖ **moderate**[1,2,3,4]	Benefit
Job stress		The mean job stress in the intervention groups was **0.09 standard deviations lower** (0.41 lower to 0.23 higher)		152 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,5]	No difference
Mental health symptoms		The mean mental health symptoms in the intervention groups was **0.09 standard deviations lower** (0.4 lower to 0.23 higher)		152 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,5]	No difference
Productivity		The mean productivity in the intervention groups was **0.26 standard deviations lower** (0.58 lower to 0.05 higher)		152 (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 concern over risk of bias due to self-report measures used
[2] Single-study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect
[5] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect.
[6] Lower values indicates and improvement in mental wellbeing

Screening and consultation vs screening only

See Forest plots Screening and consultation vs screening only: E2.1 to E2.3 and GRADE profile F.1.2

Screening and intervention vs screening only

Patient or population: Employees
Settings: Workplace
Intervention: Screening and consultation vs screening only

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	**Screening and intervention vs screening only**				
Mental health symptoms	**Study population**		**RR 0.96** (0.59 to 1.55)	201 (1 study)	⨁⨁⨀⨀ **low**[1,2,3,4]	No difference
	259 per 1000	**248 per 1000** (153 to 401)				
	Moderate					
	259 per 1000	**249 per 1000** (153 to 401)				
uptake of support services	**Study population**		**RR 0.86** (0.65 to 1.12)	204 (1 study)	⨁⨁⨀⨀ **low**[1,2,3,5]	No difference
	564 per 1000	**485 per 1000** (367 to 632)				
	Moderate					
	564 per 1000	**485 per 1000** (367 to 632)				
Productivity	**Study population**		**RR 0.76** (0.56 to 1.05)	202 (1 study)	⨁⨁⨀⨀ **low**[1,2,3,4]	No difference
	517 per 1000	**393 per 1000** (290 to 543)				
	Moderate					
	517 per 1000	**393 per 1000** (290 to 543)				

*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 concern over risk of bias due to self-report measures used
[2] Single-study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect
[5] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect

Screening and E-mental health vs screening only

See Forest plots Screening and E-Mental health vs screening only: E3.1 to E3.2 and GRADE profile F.1.3

Screening and E-mental health compared to Screening only for interventions

Patient or population: patients with interventions
Settings:
Intervention: Screening and E-mental health
Comparison: Screening only

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				
	Screening only	**Screening and E-mental health**				
Job stress	**Study population**		**RR 0.86** (0.45 to 1.65)	168 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference
	224 per 1000	**193 per 1000** (101 to 370)				
	Moderate					
	224 per 1000	**193 per 1000** (101 to 370)				
Productivity	**Study population**		**RR 0.71** (0.47 to 1.05)	168 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference
	517 per 1000	**367 per 1000** (243 to 543)				
	Moderate					
	517 per 1000	**367 per 1000** (243 to 543)				

*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 over risk of bias due to imbalance in dropout rates and self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

Structured early consultation vs usual care

See Forest plot Structured early consultation vs usual care: E4.1 and GRADE profile F.1.4

Structured early consultation compared to usual care for interventions

Patient or population: patients with interventions
Settings:

Intervention: Structured early consultation
Comparison: usual care

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				
	Usual care	**Structured early consultation**				
absenteeism		The mean absenteeism in the intervention groups was **0.1 standard deviations lower** (0.34 lower to 0.14 higher)		263 (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 concern over risk of bias due to missing data
[2] Single study analysis
[3] No concerns over directness as study population, intervention, and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

Workplace consultation vs outpatient consultation

See Forest plot Workplace consultation vs outpatient consultation E5.1 to E5.4 and GRADE profile F.1.5

Workplace consultation compared to outpatient consultation for interventions

Patient or population: patients with interventions
Settings:
Intervention: Workplace consultation
Comparison: outpatient 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	Corresponding risk				
	Outpatient consultation	**Workplace consultation**				
Mental wellbeing		The mean mental wellbeing in the intervention groups was **0.42 standard deviations lower** (0.63 to 0.21 lower)		367 (1 study)	⊕⊖⊖⊖ **very low**[1,2,3,4]	Benefit
Job stress		The mean job stress in the intervention groups was **0.41 standard deviations lower** (0.61 to 0.2 lower)		367 (1 study)	⊕⊖⊖⊖ **very low**[1,2,3,4]	Benefit
Mental health symptoms		The mean mental health symptoms in the intervention groups was **0.45 standard deviations lower** (0.65 to 0.24 lower)		367 (1 study)	⊕⊖⊖⊖ **very low**[1,2,3,4]	Benefit
Productivity		The mean productivity in the intervention groups was **0.45 standard deviations lower** (0.66 to 0.25 lower)		367 (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 over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect

Peer group vs no intervention

See Forest plot Peer group vs no intervention E6.1 to E6.2 and GRADE profile F.1.6

Peer group compared to no intervention for interventions

Patient or population: patients with interventions
Settings:
Intervention: Peer group
Comparison: no 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				
	No intervention	**Peer group**				
Job stress		The mean job stress in the intervention groups was **0.38 standard deviations lower** (0.76 lower to 0 higher)		110 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference
Mental health symptoms		The mean mental health symptoms in the intervention groups was **0.26 standard deviations lower** (0.64 lower to 0.12 higher)		110 (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 concern over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention, and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

Authentic Connections vs control

See GRADE profile F.1.7

Authentic connections compared to control for interventions

Patient or population: patients with interventions
Settings:

Intervention: Authentic connections
Comparison: control

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	**Authentic connections**				
Job stress		The mean job stress in the intervention groups was **0.49 standard deviations lower** (1.23 lower to 0.25 higher)		29 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference
Mental health symptoms		The mean mental health symptoms in the intervention groups was **0.21 standard deviations higher** (0.52 lower to 0.94 higher)		29 (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 over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol

[4] Serious concerns as 95% CIs cross the line of no effect

Evidence not suitable for GRADE analysis: Authentic connections vs protected time

Outcome	Study (no. of participants)	Risk of bias	Protected time results	Authentic connections results	*P* value
Mental wellbeing	Luthar 2017 (30)	Low	-	Brief symptom index: Partial eta square = 0.12 (small effect)	0.03 Benefit
Job stress	Luthar 2017 (30)	Low	-	Maslach burnout inventory Partial eta square = 0.08 (small effect)	0.09 No difference
Mental health symptoms	Luthar 2017 (30)	Low	-	Beck depression inventory Partial eta square = 0.17 (medium effect)	0.01 Benefit

Stress reduction programme vs usual care

See Forest plot Stress reduction programme vs E7.1 to E7.3 and GRADE profile F.1.8

Stress reduction programme compared to no intervention for interventions

Patient or population: patients with interventions
Settings:
Intervention: Stress reduction programme
Comparison: no 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				
	No intervention	**Stress reduction programme**				
Job stress (number reporting work overload)	**259 per 1000**	**430 per 1000** (285 to 646)	**RR 1.66** (1.1 to 2.49)	187 (1 study)	⊕⊖⊖⊖ **very low**[1,2,3,4]	Harm
Mental health symptoms		The mean mental health symptoms in the intervention groups was **0.45 standard deviations lower** (0.74 to 0.15 lower)		187 (1 study)	⊕⊖⊖⊖ **very low**[1,2,3,4]	Favours intervention
absenteeism	**426 per 1000**	**392 per 1000** (277 to 558)	**RR 0.92** (0.65 to 1.31)	187 (1 study)	⊕⊖⊖⊖ **very 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; **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 over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect
[5] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

Psychological support vs control

See GRADE profile F1.9

Psychological support compared to control for interventions

Patient or population: patients with interventions
Settings:
Intervention: Psychological support
Comparison: control

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	**Psychological support**				
Job stress		The mean job stress in the intervention groups was **0.08 standard deviations higher** (0.47 lower to 0.63 higher)		51 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference
Mental health symptoms		The mean mental health symptoms in the intervention		50 (1 study)	⊕⊕⊖⊖ **low**[1,2,3,4]	No difference

		groups was **0.12 standard deviations lower** (0.68 lower to 0.43 higher)	

*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 over directness as study population, intervention and outcomes match review protocol
[4] Serious concerns as 95% CIs cross the line of no effect

- No studies were identified for the following outcomes:
  - Job satisfaction, engagement or motivation
  - Presenteeism
  - Patient and public safety
  - Methods and levels of employee consultation
  - Methods and levels of employee participation
  - Incidence of discrimination, ill treatment
  - De-stigmatisation
  - Adherence to mental wellbeing policies
  - Mental health literacy, such as knowledge and awareness of mental wellbeing
  - Adverse effects or unintended consequences

1.1.10.2 Qualitative evidence

No qualitative evidence was identified for this review.

1.1.10.3 Mixed methods

As no qualitative evidence was identified, synthesis and integration of quantitative and qualitative elements could not be performed.

1.1.10.4 Economic Evidence statements

Noben (2014) found that visiting an occupational physician (OP) and an e-Mental health program, after screening-positive on a health questionnaire, were both cost-effective at improving work functioning compared with no intervention at the usual NICE threshold. The analysis used cost and cost savings data directly from a study on the intervention. From a societal perspective, the OP visit was dominant compared with the questionnaire and no intervention, and the e-Mental health intervention had an ICER of €4,054 compared with no intervention. Probabilistic sensitivity analysis (5000 bootstrap replications) found the intervention was dominant in 75% of scenarios for the OP intervention, and that 76% of scenarios for the e-Mental health intervention were in the south-west quadrant of the cost-effectiveness plane (less costly but less effective). The main limitations were the short time horizon (6-months), non-inclusion of impacts on staff turnover and lack of deterministic

sensitivity analysis. The analysis was assessed as partly applicable to the review question since it was set in the Netherlands rather than the UK.

Noben (2015) found that visiting an occupational physician (OP) after screening-positive on a health questionnaire had a positive return on investment compared with the health questionnaire and no further intervention. The analysis used cost and cost savings data directly from a study on the intervention. From an employer perspective, the questionnaire and OP had a return to investment of around €7 per €1 spent compared with 'doing nothing', and an incremental ROI of €11 per €1 compared with the control (no intervention after questionnaire). When productivity gains were lowered by 30% (i.e. potential cost savings) in the sensitivity analysis, an incremental ROI of €8 per €1 was found. The main limitations were the short time horizon (6-months) and non-inclusion of impacts on staff turnover and the spill-over effects of absenteeism which may have increased the ROI. The analysis was assessed as partly applicable to the review question since it was set in the Netherlands rather than the UK.

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

1.1.11.1. The outcomes that matter most

The most common outcome measured in the studies was mental health symptoms, followed by job stress and mental wellbeing. Employer outcomes such as productivity and absenteeism were also reported. The committee agreed that employee outcomes were of greater importance than employer outcomes in relation to their decision-making, however, they did stress that in order for organisations to use these recommendations, care should be taken not to ignore employer outcomes. Some of the outcomes in the studies were not appropriately measured by the scales used in the evidence; for example, job strain was used as a proxy for job stress within the evidence review (this will be discussed further in the committee discussion).

1.1.11.2 The quality of the evidence

Quantitative

Evidence came from 6 RCTs, 1 cRCT and 2 non-RCTs. GRADE profiling gave a certainty in the evidence of very low to medium. Most of the evidence was either low or very low quality, with main reasons for downgrading being risk of bias (self-reported outcomes and missing data) and imprecision (95% confidence intervals cross the line of no effect).

Studies were conducted in Germany, Sweden, Japan, the US, Switzerland and the Netherlands; many of these countries have a strong culture of conducting research in the area of mental wellbeing at work, and so it is likely that the primary aims of the studies were to improve mental wellbeing of employees, rather than employer outcomes. Most research was conducted in the public sector, when compared with the private sector and the healthcare industry was most represented. All studies that reported on organisation size, were large organisations; meaning that there is no evidence for targeted universal-level interventions in SMEs.

Qualitative evidence

No qualitative evidence was identified for targeted organisational-level interventions.

1.1.11.3 Benefits and harms

Most of the evidence showed no difference in measured outcomes; this was surprising to the committee as it was expected that at risk employees would be more likely to show significant improvement in outcome compared with a whole workplace in which most employees would not be at risk of poor mental wellbeing. The committee concluded that this gives support to a preventative approach where, first and foremost, organisations have a strong universal organisational-level approach to improving mental wellbeing, which is then supported by targeted interventions.

Three interventions involved a screening element; these included screening and intervention, screening and consultation, and screening and E-mental health. Low quality evidence for screening and consultation indicated no difference in mental health symptoms, uptake of support services, or productivity outcomes, and low-quality evidence for screening and E-mental health indicated no difference in job stress and productivity outcomes. There was moderate quality evidence that a screening and intervention approach (where the intervention element involved tailored information, education, and referrals for self-help or professional assistance relevant to a specific disorder) improved the outcome of mental wellbeing, however, low quality evidence from this intervention indicated no effect on job stress, mental health symptoms, or productivity.

The committee were concerned that where a combined screening and intervention strategy was used, the effects of the screening process could not be separated from the effects of the targeted intervention. There were also concerns from the committee that screening a whole workforce prior to a targeted intervention, may be classed as a universal rather than a targeted intervention.

The committee did not recommend using screening. The committee discussed, that although whole workforce mental wellbeing screening is used within some workplaces, such as emergency services, it is not commonly used in the UK. Mental health stigma means that many at risk individuals will not provide accurate information on screening and so will not be identified. The committee also felt that screening may be viewed as intrusive by many. It may also put individuals who have existing mental health concerns at risk of further stress as they may not want to disclose their mental health concerns. The committee also noted that much of the mental health screening used in the studies was by phone or computer and was regarded as impersonal. The committee advised against using automated telephone screening and intervention services, as this could be alienating to individuals. The committee suggested that this may be harmful to individuals, as it could cause more stress to those who may need additional support. The committee considered that it may be more appropriate to use staff surveys to monitor the mental wellbeing of the overall workforce [rec 1.4.5], and to ensure that employees are aware of the support available (internally or externally) to them and that managers are able to signpost employees to available support. Internal support may include access to employee assistance programmes (EAP) or occupational health services when required (see Evidence review A – organisational universal interventions). The committee also highlighted that much of the evidence was around targeting employees with mental ill health, rather that poor mental wellbeing. The committee agreed that it was important to provide support to employees at risk of poor mental wellbeing (for example employees with caring responsibilities) and highlighted the lack of evidence around what tools can be used to identify employees at risk of poor mental wellbeing. Consequently, the committee drafted a research recommendation around what tools can be used to identify employees at risk of poor mental wellbeing.

Low quality evidence indicated that a peer support group based on problem-based method was not effective in improving job stress and mental health symptoms outcomes in healthcare workers scoring above the 75th percentile in the exhaustion dimension of the Oldenburg Burnout Inventory. Due to a lack of effect, the committee did not make a recommendation around peer support groups in targeted populations, however, the

committee did discuss peer support in universal population separately (Evidence review A – organisational universal interventions). Two studies evaluated the use of 'authentic connections' interventions, which are based on structured relational psychotherapy mothers' groups. Moderate quality evidence indicated that authentic connections is likely to improve mental wellbeing, however, low quality evidence did not find any effect of authentic connections on job stress. Evidence was mixed for the outcome of mental health symptoms, where moderate quality evidence indicated that authentic connections is likely to improve mental health symptoms, whereas low quality evidence did not find a significant effect on mental health symptoms. Due to the mixed evidence, the committee did not make a recommendation around authentic connections.

There was very low-quality evidence that workplace consultation with a medical or psychotherapist may be more effective than outpatient consultation in improving outcomes of mental wellbeing, job stress, mental health symptoms, and productivity. The committee discussed the role of organisations in providing support for individuals with common mental health conditions. The committee highlighted that NHS mental health services are in huge demand and waiting lists are long, which creates equality issues. Some organisations may be prepared to pay for individuals to access mental health services privately. There are also resources that organisations can access such as the DWP's Access to Work Mental Health Support Service. Therefore, the committee recommended that organisations direct people who have mental health problems to the DWP's Access to Work Mental Health Support Service [rec 1.3.2]. The committee also recognised the importance of the treatment provider and noted that the evidence supported interventions that were delivered by a psychotherapist.

Low quality evidence from a single study found no effect of structured early consultation on the outcome of absenteeism. Low quality evidence from a single study also found no effect of psychological support on job stress or mental health symptoms. Due to the lack of effect in these trials, the committee chose not to recommend these interventions.

Very low-quality evidence from a single study looking at a stress reduction programme, indicated an improvement in mental health symptoms, but no difference in absenteeism. Low quality evidence from the study also indicated that the intervention worsened job stress. The committee concluded that the most likely explanation for worsening of job stress was that job overload was used as a proxy for job stress, meaning that this outcome was likely affected by the work environment. It was possible that an improvement in mental health symptoms, associated with the intervention, could also have resulted in increased work capacity. The committee felt that this highlighted the need to ensure that employers did not use interventions aimed at improving mental wellbeing, as a means to improve employee productivity.

The committee highlighted that it may also be useful to identify population subgroups that are at risk of poor mental wellbeing such as those with caring responsibilities or pre-existing physical or mental health concerns. The committee also recognised that there may be some population subgroups who are at increased risk of bullying and may require additional support. In addition, the committee noted that there was a lack of evidence on groups who are disadvantaged due to inequalities, the committee considered that organisational interventions were an important tool to improve inequalities in the workplace. Therefore, the committee recommended that employers should offer organisational support to subgroups who may be at risk of poor mental health in addition to those who have poor mental health [rec 1.7.2]. The committee discussed how a wellness action plan to assess whether any changes need to be made at an organisational level [rec 1.7.2].

The committee discussed that the COVID-19 pandemic and subsequent changes to the workplace, as well as an increased level of stress across the workforce, will lead to a rise in the number of employees requiring treatment for mental health conditions. This will be particularly relevant for health and social care professionals, who will be at increased risk of

PTSD. The committee heard expert testimony around managing mental health in the workplace during and after COVID-19, which emphasised the importance of a supportive work environment. This informed the committees drafting of recommendations around a fostering a supportive work environment [rec 1.2.1]. Expert testimony also highlighted that in terms of exposure to trauma, organisations can generally be divided into two categories: those with predictable exposure to trauma/stress, and those with unexpected trauma/stress. The committee discussed that in organisations where there are predictable, stressful occupational event, for example emergency services, these organisations will usually have organisational-level policies and protocols, and the committee recommended that these are regularly reviewed [rec 1.8.1]. The committee also recommended that organisations ensure that practice is consistent with established best practice (for example, MIND Blue Light Programme) [rec 1.8.2]. In addition to recommendations around how to provide a supportive work environment [recs 1.2.1 to 1.2.4] the committee also recommended that employees in high-risk occupations are offered support after a traumatic occupational event [rec 1.8.4]

Topic experts provided background evidence to suggest that, in addition to being clear with staff and providing information about the ongoing situation, healthcare employers may consider providing staff with coping skills training and peer support. In addition, evidence suggests that employers should meet basic staff requirements in terms of shift patterns, rest areas, and suitable safety equipment. The committee discussed how evidence also suggests that leaders should ensure that up-to-date and accurate information on local and national supportive services are well advertised. The committee discussed the possibility of using military-focused studies to provide evidence that may be relevant in the context of COVID-19. One such intervention is Trauma Risk Management (TRiM), which was developed by the UK military and is now used in the NHS.

The committee discussed how many people will be affected by unexpected trauma/stress as a result of events such as pandemics and terrorist attacks and recommended that all organisations should have a plan for how to support the mental wellbeing of their employees in case this happens [rec 1.4.7].

1.1.11.4 Cost effectiveness and resource use

The committee considered evidence from two published cost effectiveness studies.

The first (Noben 2014) was a comparative cost-effectiveness analysis of two interventions to promote work functioning by targeting mental health complaints among nurses. The population were nurses in a Dutch hospital who, after screening positive on a health questionnaire, received either visits from an occupational physician or an e-Mental health program. The OP visit intervention was dominant compared with the control and e-Mental health intervention had an ICER of €4,054 per treatment responder compared with control.

The second study (Noben 2015), which also involved nurses, was carried out in a Dutch academic medical centre. The intervention comprised visits from an occupational health physician after screening positive on a health questionnaire. A positive return on investment of around €7 per €1 spent compared with ‘doing nothing’, and an incremental ROI of €11 per €1 compared with the control.

The committee noted a number of limitations such as the short (6 month) time horizon, non-inclusion of impacts on staff turnover and spillover effects of absenteeism (increased workload on colleagues). However, they observed that both studies reported favourable outcomes in the main analyses as well as in the sensitivity analyses. On that basis the committee considered them cost effective approaches. In addition, by limiting the impact of the intervention on sickness absence and presenteeism, the committee considered the Noben (2015) study had not captured the full effects of the intervention.

The specificity of the population and setting gave the committee cause for concern over the generalisability of the findings to other occupations. They were also mindful of transferring

the results to the UK, given the differences in prices and healthcare systems between the UK and the Netherlands.

The committee also commented on the challenge of interpreting the results of interventions which combine two elements: universal "screening" and a targeted individual element. As indicated earlier, the committee also questioned the appropriateness of some of the measures deployed to screen employees.

Based on the very limited published evidence, the committee thought any further economic analyses should include an assessment of universal targeted interventions.

With that in mind a generalised model was built to explore the impact of mental wellbeing interventions at work over a one-year time horizon from the employer perspective. A wider perspective capturing employee outcomes was also incorporated in the model in the form of a cost-consequences analysis. The latter was necessary due to an absence of quantitative data.

The committee noted that interventions could be cost saving for the employer but that the results varied greatly 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 also noted 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 workplace environment where employees are able to discuss issues and seek help without judgement. Nevertheless, the committee believed it crucially important that employers take account of any potential adverse consequences in deciding whether to fund an intervention. 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.

1.1.11.5 Other factors the committee took into account

The committee highlighted that NICE's guidance on reducing recurrence of absence for people with a common mental health condition in NG146 (1.7.2) could also be referenced. Further information about early interventions such as EAP are covered in NICE's guidance on Workplace Health: long-term sickness absence and capability to work [NG146] in section 1.6.

The committee also discussed the consequences of COVID-19 on equality, and highlighted that individuals from ethnic minority backgrounds, those living in deprived areas, and those living in over-crowded accommodation will also be at higher risk for negative outcomes of COVID-19.

1.1.12 Recommendations supported by this evidence review

This evidence review supports recommendations 1.2.1 – 1.2.4, 1.3.2, 1.4.5, 1.4.7, 1.7.2, 1.8.1 – 1.8.2, 1.8.4, and the research recommendation on Supportive work environment, Addressing study reporting, Needs of different employee groups, and Approaches for all employees. Other evidence supporting these recommendations can be found in the evidence reviews on organisational universal level approaches: Reviews A; universal approaches for managers: Review B; 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

1.1.13.1 Effectiveness

Chesak, Sherry S; Bhagra, Anjali; Cutshall, Susanne; Ingram, Alexandra; Benoit, Renee; Medina-Inojosa, Jose R; Hayes, Sharonne N; Carolan, Bridget J; Luthar, Suniya; Authentic Connections Groups: A Pilot Test of an Intervention Aimed at Enhancing Resilience Among Nurse Leader Mothers.; Worldviews on evidence-based nursing; 2020; vol. 17 (no. 1); 39-48

Farzanfar, R., Locke, S.E., Heeren, T.C. et al. (2011) Workplace telecommunications technology to identify mental health disorders and facilitate self-help or professional referrals. American journal of health promotion : AJHP 25(3): 207-216

Gartner, F.R., Ketelaar, S.M., Smeets, O. et al. (2011) The Mental Vitality @ Work study: design of a randomized controlled trial on the effect of a workers' health surveillance mental module for nurses and allied health professionals. BMC public health 11: 290

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

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

Kawakami, N, Araki, S, Kawashima, M et al. (1997) Effects of work-related stress reduction on depressive symptoms among Japanese blue-collar workers. Scandinavian journal of work, environment & health 23(1): 54-59

Luthar, Suniya S, Curlee, Alexandria, Tye, Susannah J et al. (2017) Fostering Resilience among Mothers under Stress: "Authentic Connections Groups" for Medical Professionals. Women's health issues : official publication of the Jacobs Institute of Women's Health 27(3): 382-390

Ricou, B.; Gigon, F.; Durand-Steiner, E.; Liesenberg, M.; Chemin-Renais, C.; Merlani, P.; Delaloye, S.; Initiative for Burnout of ICU Caregivers: Feasibility and Preliminary Results of a Psychological Support; Journal of Intensive Care Medicine; 2018

Peterson, Ulla (2008) Stress and Burnout in Healthcare Workers. Karolinska Institutet, Department of Clinical Neuroscience

Peterson, Ulla, Bergstrom, Gunnar, Samuelsson, Mats et al. (2008) Reflecting peer-support groups in the prevention of stress and burnout: randomized controlled trial. Journal of advanced nursing 63(5): 506-16

Rothermund, Eva, Gundel, Harald, Rottler, Edit et al. (2016) Effectiveness of psychotherapeutic consultation in the workplace: a controlled observational trial. BMC public health 16: 891

1.1.15.2 Economic

No studies were included for RQ 3.

Appendices

Appendix A – Review protocols

Review protocol for targeted organisational approaches

Table 4: Protocol

Field	Content
PROSPERO registration number	CRD42020175044
Review title (50 Words)	Workplace organisational-level interventions targeted to employees who experience or who are identified as being at risk of poor mental wellbeing
Review question (250 words)	Quantitative 3.1 What, organisational-level interventions, programmes, policies or strategies targeted to employees who experience or are identified as being at risk of poor mental wellbeing at work are effective and cost effective at: • promoting positive mental wellbeing? • improving mental wellbeing? • preventing poor mental wellbeing? Qualitative 3.2 For the following groups in relation to organisational-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: • employees receiving them • employers • those delivering them?
Objective	Quantitative

Field	Content
NB – this section does not appear in the submission on the Prospero system	To identify what interventions delivered at an organisational level and targeted to employees who experience, or who are identified as being at risk of, poor mental wellbeing are effective in: • promoting positive mental wellbeing • improving mental wellbeing • preventing poor mental wellbeing Qualitative To understand the views and experiences (including acceptability of and barriers & facilitators to) of interventions delivered at an organisational level and targeted to employees who experience, or who are identified as being at risk of, poor mental wellbeing. Quantitative and qualitative 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.
Searches (300 words)	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Psycinfo • Econlit • Epistemonikos • ASSIA • HealthEvidence.org Search strategies will be adapted to take account of the limitations of each database.

Field	Content
	The same search strategy will be used for questions 1-5 for this guideline, with all retrieved studies potentially being includable in each review. Searches will be limited by the use of • validated filters as follows: o Date : Studies published from 2007 to present (though included studies from the previous NICE guideline, PH22, will also be considered for inclusion) o Language : English language o Study design : RCT filter • Search strategies o OECD countries plus Brazil, China, Russia, India and South Africa o Non-randomised controlled studies Searches will exclude the following publication types: • Editorials • news articles • Letters • Conference abstracts • “Notes” • Other non-research publications Other searches: 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. The What Works Wellbeing and Department for Work and Pensions research reports websites will also be browsed for relevant evidence

Field	Content
	The searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion. The full search strategies for MEDLINE database will be published in the final review.
Condition or domain being studied (200 words)	Mental wellbeing in the workplace
Population (200 words)	Inclusion: Quantitative and Qualitative Employees who: • 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) Studies will be eligible where participants include those who are aged 16 years or older in full or part time employment including: • those on permanent, training, temporary or zero hours contracts • those who are self-employed • those who are volunteers • Qualitative only • employers, managers • those delivering the interventions Exclusion: Quantitative and Qualitative • People who are not employed • Prisoners who engage in work activities • Inpatients in mental health institutions who engage in work activities • Military personnel

Field	Content
	• People not identified as being at risk of, or experiencing, poor mental wellbeing
Intervention	Inclusion: Quantitative and Qualitative Organisational-level approaches delivered to a selected population in addition to usual practice that aims to (one or more of): - improve mental wellbeing - promote positive mental wellbeing - prevent poor mental wellbeing. This may include approaches such as: - peer support initiatives - encouraging or signposting people to seek support at work or externally - Organisation changes such as structures, policies, processes, culture/climate, programmes 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.) Exclusion: Quantitative and qualitative • Interventions that are universally available for all employees regardless of their mental wellbeing status • Therapy-based interventions for clinically diagnosed mental health conditions • Interventions that are part of a return-to-work programme or aimed at employees on a long-term sickness absence • Interventions delivered outside of work without workplace involvement or collaboration.

Field	Content
Comparator/Reference standard/Confounding factors (200 words)	Quantitative Inclusion: Usual practice (this may be called a control group or waiting list control group or other terms in the individual studies) Qualitative Not applicable
Types of study to be included (150 words)	Inclusion: Quantitative Effectiveness studies that include one or more intervention and comparison groups including: • Systematic reviews (published in 2019 or 2020 to ensure currency) • Randomised controlled trials • Non-randomised comparative studies Qualitative • Studies with a qualitative component including focus groups and interview-based studies. • Mixed-methods studies will also be included provided they contain relevant qualitative data Exclusion: Quantitative • Correlation studies • Cross-sectional surveys • Case studies • Single-arm studies
Other exclusion criteria (no separate section for this to be entered on PROSPERO – it gets included in the section	Quantitative and Qualitative • Papers published in languages other than English

Field	Content
above so within that word count)	• Studies not published (e.g. study protocols where no results are published, summary articles) • Studies published before 2007 will be excluded, with the exception of effectiveness studies that were included in PH22. Quantitative only • Studies carried out in non-OECD and non-BRICS countries Qualitative only • Studies conducted outside the UK
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. 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. 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. Poorer mental wellbeing however is associated with increased absenteeism and presenteeism and lost output costs the economy upwards of £74 billion annually. 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.
Primary outcomes (critical outcomes) (200 words)	Quantitative Employee outcomes

Field	Content
	• Any measure of mental wellbeing (using objective measures and/ or validated self-report measures) • Job stress, burnout or fatigue (using objective measures and/ or validated self-report measures) • Symptoms of mental health conditions such as depression, anxiety, insomnia (using validated self-report measures) • Absenteeism • Presenteeism • Productivity • Job satisfaction, engagement or motivation • Quality of life • Uptake of support services Employer outcomes • Productivity • Absenteeism • Presenteeism Qualitative Eligible studies will include as outcomes the views and experiences with the interventions of: - Employees receiving them - Employers - Those delivering the interventions
Timing	Timing and measures: Quantitative We will consider outcomes at any follow up. Priority will be given to the longest follow up time for an outcome.

Field	Content
	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. 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. Qualitative We will consider outcomes at any time point following implementation.
Secondary outcomes (important outcomes) (200 words)	Quantitative • Patient and public safety • Employee retention • Methods and levels of employee consultation and participation • Incidence of discrimination, ill-treatment • De-stigmatisation • Adherence to mental wellbeing policies • Mental health literacy, such as knowledge and awareness about mental wellbeing • Unintended consequences or adverse effects Qualitative Not applicable
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. 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 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.

Field	Content
	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. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. 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. 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 for meta-analysis purposes. Study investigators may be contacted for missing data where time and resources allow.
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. Quantitative For systematic reviews, we will use the ROBIS tool For randomised controlled trials, we will use Cochrane Risk of Bias Tool 2.0. For non- randomised controlled trials, we will use the ROBINS-I tool Qualitative For qualitative studies we will use the CASP qualitative checklist

Field	Content
Strategy for data synthesis (300 words)	Quantitative Studies will be grouped according to the type of intervention as appropriate. 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. • Dichotomous data will be pooled where appropriate and the effect size will be reported using risk ratios in a standard pair-wise meta-analysis. • Continuous outcomes reported on the same scale will be pooled in a standard pair-wise meta-analysis using mean difference where possible. • Continuous outcomes not reported on the same scale will be pooled using a standardised mean difference in a standard pair-wise meta-analysis. 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. Unexplained heterogeneity will be examined where appropriate with a sensitivity analysis based on risk of bias. 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/ Qualitative 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. Where possible we will categorise groups views and experiences relating to acceptability into the following categories:

Field	Content
	• affective attitude (how the participant feels about the intervention) • burden (perceptions about the amount effort required to participate) • perceived effectiveness • ethicality (whether the intervention fits within the participant's value system) • intervention coherence (whether the participant understands the intervention) • opportunity costs for engaging • self-efficacy to participate The quality or certainty across all available evidence will be evaluated for each outcome using the GRADE CERQual approach. Integration of data As we have included different types of data from different sources as follows: • Quantitative o effectiveness data from intervention studies • Qualitative o View and experiences data related to interventions 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. Where quantitative and qualitative data comes from • the same study, the technical team will present the qualitative analytical themes next to quantitative effectiveness data for the committee to discuss. • different studies, the committee will be asked to interpret both sets of finding using a matrix approach for the committee discussion section.
Analysis of sub-groups (250 words)	Quantitative Where evidence allows, subgroup analyses will be conducted. Depending on the evidence available, some or all of the following subgroups will be explored, including: • Gender • Age

Field	Content
	• Disability or other long-term physical or mental health condition status • Socioeconomic status (e.g. type of industry: manual, semi-skilled, skilled). • Work sector (voluntary, public, private) • Organisation size (micro, small, medium and large) • Type of employment contract (part-time, temporary, full-time, voluntary, training) • Other groups for consideration listed in the EIA Qualitative Not applicable
Type of method of review	• Intervention
Language	English
Country	England
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. A protocol can be deemed complete after sign-off by the NICE team with responsibility for quality assurance.]
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.]
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

Field	Content
Named contact	5a. Named contact Public Health Guideline Development Team 5b Named contact e-mail [Guideline email]@nice.org.uk [Developer to check with Guideline Coordinator for email address] 5c Named contact address National Institute for Health and Care Excellence 10 Spring Gardens London SW1A 2BU 5d Named contact phone number +44 (0)300 323 0148 5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and NICE Public Health Guideline Development Team.
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.] From the Centre for Guidelines: • [Tech lead] • [Tech analyst] • [Health economist] • [Information specialist] • [Others]

Field	Content
Funding sources/sponsor	This systematic review is being completed by the Centre for Guidelines which receives funding from NICE.
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.
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. Members of the guideline committee are available on the NICE website: [NICE guideline webpage]. Or Members of the guideline committee are: • Chair, Name… • Name, Role
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.]
Reference/URL for published protocol	[Give the citation and link for the published protocol, if there is one.]

Field	Content
Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • 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. [Add in any additional agree dissemination plans.]
Keywords	[Give words or phrases that best describe the review.]
Details of existing review of same topic by same authors	[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]
Current review status	Ongoing Completed but not published Completed and published Completed, published and being updated Discontinued
Additional information	Provide any other information the review team feel is relevant to the registration of the review.]
Details of final publication	https://www.nice.org.uk/

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" OR "Professionals" OR "Personnel management" OR "Human resources management" OR "Staffing") OR MAINSUBJECT.EXACT("Labour force" OR "Workplace control"	9926

	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 are 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.

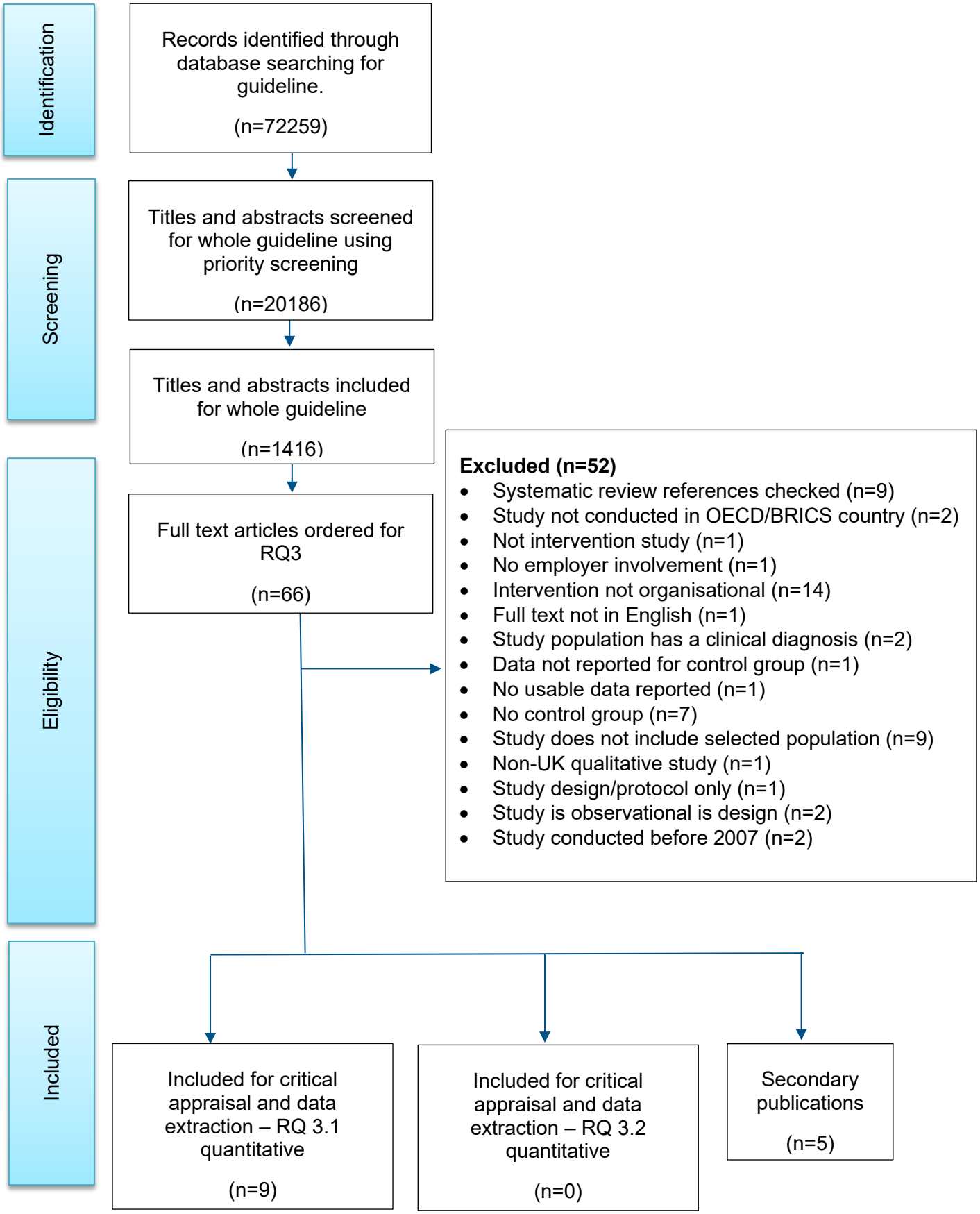
Rerun searches.

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

	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 Chesak, 2020

Bibliographic Reference	Chesak, Sherry S; Bhagra, Anjali; Cutshall, Susanne; Ingram, Alexandra; Benoit, Renee; Medina-Inojosa, Jose R; Hayes, Sharonne N; Carolan, Bridget J; Luthar, Suniya; Authentic Connections Groups: A Pilot Test of an Intervention Aimed at Enhancing Resilience Among Nurse Leader Mothers.; Worldviews on evidence-based nursing; 2020; vol. 17 (no. 1); 39-48

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported
Aim	Ascertain the effects of the Authentic Connections Groups intervention among nurse leaders who are mothers at Mayo Clinic in comparison with a control group
Country/geographical location	USA
Setting	Workplace - healthcare setting Sector - NR Industry - Healthcare - Mayo clinic Large organisations Contract type - Not reported. Seniority - Nurse leaders
Inclusion criteria	Mayo clinic employees who was a nursing education specialist or clinical nurse specialist, and a mother to at least one child or adult child
Exclusion criteria	Being actively suicidal or meeting criteria for psychoses

Method of randomisation	Not specified - reference to 'randomized controlled design' only.
Method of allocation concealment	Not reported
Unit of allocation	Individual
Unit of analysis	Individual
Statistical method(s) used to analyse the data	Repeated measures ANOVA and one-way ANCOVA analyses; Mean/SD
Attrition	7/36 (19%) lost to follow-up (n=6 in intervention arm; 1 control arm)
Study limitations (author)	Relatively small sample size; Limited by lack of racial and ethnic diversity among participants; The follow-up period was relatively short at 3 months and was limited to self-report outcome measures.
Study limitations (reviewer)	No reference to blinding procedures or allocation concealment; Details regarding method of randomization not specified; No sample demographic details
Source of funding	Elizabeth C. Bonner Endowment Fund; Authentic Connections

Study arms

Authentic Connections (AC) (N = 18)
To facilitate authentic, mutually supportive relationships among women—these, then, come to serve as vital “protective factors” for the future, increasing women’s resilience and reducing stress, burnout, and allostatic load. Small group sessions (1hr per week over 12 weeks), which were reserved on their online work calendars.

Control (N = 18)
1hr per week of protected time reserved on their online work calendars for 12 weeks. They were requested to not do any work-related activities during that hour.

Characteristics

Study-level characteristics

Characteristic	Study (N = 36)
Age Nominal	NR
Gender Nominal	NR
Ethnicity Nominal	NR

Outcomes

Study timepoints

- Baseline
- 12 week (Post-intervention)
- 24 week (3-months post intervention)

Depression

Outcome	Authentic Connections (AC), Baseline, N = 18	Authentic Connections (AC), 12 week, N = 13	Authentic Connections (AC), 24 week, N = 15	Control, Baseline, N = 18	Control, 12 week, N = 17	Control, 24 week, N = 14
Depression Mean (SD)	41.5 (7.79)	36 (7.01)	36.07 (6.27)	37.17 (7.98)	36.12 (7.74)	34.57 (7.68)

Depression - Polarity - Lower values are better.
Zung Self-Rating Depression Scale

Anxiety

Outcome	Authentic Connections (AC), Baseline, N = 18	Authentic Connections (AC), 12 week, N = 13	Authentic Connections (AC), 24 week, N = 15	Control, Baseline, N = 18	Control, 12 week, N = 17	Control, 24 week, N = 14
Anxiety Mean (SD)	36.11 (6.27)	31 (3.58)	30.4 (4.05)	36.61 (6.65)	33.35 (6.12)	33.43 (11.8)

Anxiety - Polarity - Lower values are better.
Zung Self-Rating Anxiety Scale

Perceived stress

Outcome	Authentic Connections (AC), Baseline, N = 18	Authentic Connections (AC), 12 week, N = 13	Authentic Connections (AC), 24 week, N = 15	Control, Baseline, N = 18	Control, 12 week, N = 17	Control, 24 week, N = 14
Perceived stress Mean (SD)	11.72 (3.16)	10.15 (2.76)	8.8 (2.86)	11.22 (3.98)	10.76 (4.66)	10.62 (4.27)

Perceived stress - Polarity - Lower values are better.
Perceived Stress Scale

Burnout

Outcome	Authentic Connections (AC), Baseline, N = 18	Authentic Connections (AC), 12 week, N = 13	Authentic Connections (AC), 24 week, N = 15	Control, Baseline, N = 18	Control, 12 week, N = 17	Control, 24 week, N = 14
Emotional exhaustion Mean (SD)	23.11 (5.43)	19.67 (5.28)	21.4 (4.88)	23.89 (4.51)	22.12 (5.59)	21.85 (6.41)

Emotional exhaustion - Polarity - Lower values are better.
Maslach Burnout Inventory

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

Depression-Mean SD-Authentic Connections (AC)-Control-t12

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data*

Section	Question	Answer
		via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)

Depression-Mean SD-Authentic Connections (AC)-Control-t24

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided;*

Section	Question	Answer
		ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)

Anxiety-Mean SD-Authentic Connections (AC)-Control-t12

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*

Section	Question	Answer
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Anxiety-Mean SD-Authentic Connections (AC)-Control-t24

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Perceived stress- Mean SD-Authentic Connections (AC)-Control-t12

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*

Section	Question	Answer
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Perceived stress-Mean SD-Authentic Connections (AC)-Control-t24

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*

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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Burnout-Emotional exhaustion-Mean SD-Authentic Connections (AC)-Control-t12

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*

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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Burnout-Emotional Exhaustion-Mean SD-Authentic Connections (AC)-Control-t24

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Study described as a randomized control trial but details regarding randomisation, blinding an allocation concealment unclear or not provided)*
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)	Some concerns *(Lack of details regarding randomization; No evidence of any blinding or random or allocation concealment ITT or alternative not outlined)*
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)	Some concerns *(Lack of analysis to estimate the effect of adhering to intervention; No evidence of blinding or allocation concealment;)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined)*
Overall bias	Risk of bias judgement	Some concerns *(Study described as a randomized control trial but details regarding randomization, blinding and allocation concealment unclear or not provided; ITT or alternative not outlined; Lack of analysis to estimate the effect of adhering to intervention; 30/36 participants provided data at 12 weeks and 29/36 provided data at 24 weeks; Despite the absence of blinding and allocation concealment, validated questionnaires were used to collect data via self-report; Statistical analysis and outcomes appear prespecified with all outcomes reported and analysis undertaken as outlined.)*

Study arms

Authentic Connections (AC) (N = 18)

Brief name	Supportive relationships
Rationale/theory/Goal	Facilitate authentic, mutually supportive relationships among women which then, come to serve as vital “protective factors” for the future, increasing women’s resilience and reducing stress, burnout, and allostatic load.
Materials used	NR - Small group sessions facilitated by 2 investigators who had attended 'mentored training' (NR) and had weekly conversations with the intervention creator
Procedures used	Intervention groups participated in small group sessions (1hr per week over 12 weeks), which were reserved on their online work calendars. Facilitated discussions centred on acknowledging and addressing stressors that professional mothers who are raising children face. Participants in the control group were provided 1hr per week of protected time reserved on their online work calendars for 12 weeks and were requested to not do any work-related activities during that hour.
Provider	NR
Method of delivery	Intervention was delivered small group face-to-face 1hr session per week for 12 weeks.
Setting/location of intervention	Healthcare setting (Mayo clinic)
Intensity/duration of the intervention	Intervention groups participated in small group sessions (1hr per week over 12 weeks).
Tailoring/adaptation	NR
Unforeseen modifications	NR
Planned treatment fidelity	The investigators met with the intervention creator, on a weekly basis via 1-hr phone calls - no further details
Actual treatment fidelity	Not reported
Other details	NR

To facilitate authentic, mutually supportive relationships among women—these, then, come to serve as vital “protective factors” for the future, increasing women’s resilience and reducing stress, burnout, and allostatic load. Small group sessions (1hr per week over 12 weeks), which were reserved on their online work calendars.

Control (N = 18) - 1hr per week of protected time reserved on their online work calendars for 12 weeks. They were requested to not do any work-related activities during that hour.

Brief name	Control
Rationale/theory/Goal	Control arm
Materials used	1hr per week of protected time reserved on their online work calendars for 12 weeks and were requested to not do any work-related activities during that hour.
Procedures used	Participants in the control group were provided 1hr per week of protected time reserved on their online work calendars for 12 weeks and were requested to not do any work-related activities during that hour.
Provider	NR
Method of delivery	Control was 1hr protected time with a request to not undertaken any work.
Setting/location of intervention	Healthcare setting (Mayo clinic)
Intensity/duration of the intervention	Control groups provided 1 hr per week of protected time reserved and requested to not do any work-related activities during that hour.
Tailoring/adaptation	NR
Unforeseen modifications	NR
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported
Other details	Not reported

D.2 Farzanfar 2011

Farzanfar, 2011

Bibliographic Reference	Farzanfar, R.; Locke, S.E.; Heeren, T.C.; Stevens, A.; Vachon, L.; Thi Nguyen, M.K.; Friedman, R.H.; Workplace telecommunications technology to identify mental health disorders and facilitate self-help or professional referrals; American journal of health promotion : AJHP; 2011; vol. 25 (no. 3); 207-216

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported
Aim	To assess the impact of an automated workplace mental health assessment and intervention.
Country/geographical location	USA
Setting	Workplace - Sector - mix of public and private Industry - Mix - including Boston Medical Center, Boston University, and EMC Large organisations Contract type - Not reported Seniority - Not reported
Inclusion criteria	ability to speak and understand conversational English, 18 years of age or older, access to a touch-tone telephone, not undergoing mental health treatment or currently taking a medication prescribed for mental health treatment, and experiencing emotional distress based on a positive score on the WHO-5 Well-being Index
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	Independent sample t-tests and x2 tests as well as mean change were used to compare the data (changes in productivity and changes in mental health symptoms.
Attrition	Data were available for 91% of the randomized subjects (total: 152 out of 164). There was higher number of dropouts among the intervention group which may be an indication of the greater time commitment that was expected.
Study limitations (author)	Study was underpowered due to recruitment issues. After the completion of the assessment those in the control group may have undertaken self-care efforts as they have been advised by the automated system.
Source of funding	Centers for Disease Control and Prevention grant (R01 DP000116) .

Study arms

TLC Detect and intervention (N = 89) Automated workplace mental health assessment and intervention system
TLC Detect and no intervention (N = 78)

Characteristics

Arm-level characteristics

	TLC Detect and intervention (N = 89)	**TLC Detect and no intervention (N = 78)**
Age		
Mean/SD	39 (10.4)	39.2 (11.5)
Gender		
Male		
Sample Size	n = 24 ; % = 27	n = 17 ; % = 21.8
Female		
Sample Size	n = 65 ; % = 73	n = 61 ; % = 78.2
Ethnicity		

	TLC Detect and intervention (N = 89)	TLC Detect and no intervention (N = 78)
White		
Sample Size	n = 49 ; % = 55.1	n = 45 ; % = 57.7
Black / African American		
Sample Size	n = 30 ; % = 33.7	n = 23 ; % = 29.5
Other		
Sample Size	n = 10 ; % = 11.2	n = 10 ; % = 12.8
Socioeconomic status **Reported as education level**		
College graduate		
Sample Size	n = 54 ; % = 60.7	n = 49 ; % = 62.8
Non-college graduate		
Sample Size	n = 35 ; % = 39.3	n = 29 ; % = 37.2

Outcomes

Study timepoints	Baseline 6 (month) (Postvention)

Employee outcomes

	TLC Detect and intervention		TLC Detect and no intervention	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**
	N = 89	N = 89	N = 78	N = 78
Mental health symptoms reported as depression (PHQ-9) *Polarity: Lower values are better*				
Sample Size	n = 89 ; % = 100	n = 77 ; % = 86.5	n = 78 ; % = 100	n = 75 ; % = 96.2

	TLC Detect and intervention		TLC Detect and no intervention	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**
	N = 89	N = 89	N = 78	N = 78
Mean/SD	7.9 (5.3)	-2.2 (4.7)	7.7 (4.9)	-1.8 (4.5)
Job stress Reported as Stress Questionnaire score *Polarity: Lower values are better*				
Sample Size	n = 89 ; % = 100	n = 77 ; % = 86.5	n = 78 ; % = 100	n = 75 ; % = 96.2
Mean/SD	2.3 (0.8)	-2.1 (3.4)	2.3 (0.7)	-1.8 (3.1)
Mental wellbeing Medical Outcomes Questionnaire Short Form- 12 (SF-12)-Mental health scale *Polarity: Higher values are better*				
Sample Size	n = 89 ; % = 100	n = 77 ; % = 86.5	n = 78 ; % = 100	n = 75 ; % = 96.2
Mean/SD	37.5 (9.3)	10.9 (0.7)	7.7 (4.9)	6 (12.7)

Employer outcomes

	TLC Detect and intervention		TLC Detect and no intervention	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**
	N = 89	N = 89	N = 78	N = 78
productivity Productivity index (Qork Limitation Questionnaire) *Polarity: Lower values are better*				
Sample Size	n = 89 ; % = 100	n = 77 ; % = 86.5	n = 78 ; % = 100	n = 75 ; % = 96.2
Mean/SD	9.9 (4.8)	-4.1 (5.7)	10.1 (5)	-2.7 (4.7)

Risk of Bias - Mental health symptoms

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
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)

Risk of Bias - Job stress

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
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)

Risk of Bias – Mental wellbeing

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
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)

Risk of Bias - Productivity

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
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)

TIDieR checklist

TLC Detect and intervention (N = 89)

Brief name	TLC Detect and intervention [P 208]
Rationale/theory/Goal	The aim of the system is to screen for undiagnosed and/or untreated mental health problems and help determine feasible self-management or professional care options. [Abstract]
Materials used	Modules and workbooks.[P 211]
Procedures used	The system included three modules: the screening module, the intervention module, and the intervention follow-up module. In the screening module, participants connected from their phones to the automated program to receive assessment for mental health disorders that are known to reduce employee productivity. A submodule was also contained for ‘‘Unspecified Emotional Distress’’ to address situations of high level of life stressors or significant functional impairment. The intervention module provided tailored information, education, and referrals for self-help or professional assistance relevant to a specific disorder. The intervention consists of education and referral submodules. Education modules included tailored information about participants disorder, including symptoms, natural history, and available treatments. The referral submodule contains disorder-specific information on both self-management and professional help appropriate to the level of its severity as determined by the system’s assessment. Individual and group therapy options were also provided, based on the screening assessment of disorder severity. All participants in the intervention group received a brief follow-up call once a month for a total of 6 months [P 210-211]
Provider	TLC-Detect used a pre-recorded, digitized voice of a female voice actor.[P 209]
Method of delivery	Phone [P209]
Setting/location of intervention	Workplace [Abstract]
Intensity/duration of the intervention	Intensity not reported Total duration: 6 months [p 211]
Tailoring/adaptation	None reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

TLC Detect and no intervention (N = 78)	
Brief name	TLC Detect only [P209]
Rationale/theory/Goal	The aim of the system is to screen for undiagnosed and/or untreated mental health problems and to give advice to contact their health care professional [P 209]
Materials used	None
Procedures used	Participants in the control group connected to the automated program and received assessment for mental health disorders and were briefly advised by the system to confer with their clinicians about their symptoms. [P 209]
Provider	Not applicable
Method of delivery	Phone [P 209]
Setting/location of intervention	Workplace [P209]
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

D.3 Gartner 2013

Bibliographic Reference	Gartner, F.R.; Nieuwenhuijsen, K.; Ketelaar, S.M.; Van Dijk, F.J.H.; Sluiter, J.K.; 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; 2013; vol. 55 (no. 10); 1219-1229

Study details

Study design	Cluster randomised controlled trial
Trial registration number	NTR2786
Study start date	Mar-2011
Aim	To assess the effectiveness of a mental module for workers' health surveillance (screening tool) for health care workers as regards work functioning and mental health
Country/geographical location	The Netherlands
Setting	Workplace Public sector Healthcare industry Large organisation Mix of contract type (permanent, fixed-term, temporary) Seniority - Not reported
Inclusion criteria	they were not and not expected to be on sick leave (more than 2 weeks) at the start of the study screened positive on the mental health screen or the work-functioning screen.
Exclusion criteria	Not reported
Method of randomisation	Randomization sequences with a block size of three were generated using computer Nquery Advisor.
Method of allocation concealment	Researchers, managers of participating departments, and occupational physicians were not blinded for group allocation.
Unit of allocation	Ward
Unit of analysis	Individual
Statistical method(s) used to analyse the data	Intention-to-treat analyses were performed at the level of the individual worker. Generalized linear mixed models were used to analyse the differences in dichotomous outcome measures (help-seeking behaviour, intention to seek help, informal help-seeking behaviour, and work as the focus of the consultation).

	Linear mixed models (LMMs) were used to assess differences in continuous outcomes (impaired work functioning and the mental health complaints). Continuous outcome measures with skewed distributions were log-transformed to meet the basic assumption of LMMs.
Attrition	Only 51 of the 151 who screened positive in the intervention group visited the occupational physician. In total 99/210 (47.1%) in the intervention group and 126/211 (59.7%) completed all three assessments
Study limitations (author)	Sufficient power was not achieved. Lack of a supplementary per-protocol analysis, due to the small sample size, in which effects would be analysed separately for the group of workers that followed the invitation of the occupational physician. Future research should investigate the effect of communicating positive screening results on the recognition of work functioning or mental health problems.
Study limitations (reviewer)	the intra class correlation coefficient was not reported in the study in order to be able to adjust for the cluster effect No subgroup analysis based on those who attended the intervention appointment.
Source of funding	Dutch Foundation Institute Gak. the Netherlands institute for health research and development (ZonMw).

Study arms

WHS screening and consultation (N = 151) Number of wards randomised = 29
WHS screening only (N = 161) Number of wards randomised = 29
WHS screening and E-mental health (N = 139) Number of wards randomised = 29

Characteristics

Arm-level characteristics

	WHS screening and consultation (N = 151)	WHS screening only (N = 161)	WHS screening and E-mental health (N = 139)
Age *(years)*			
Mean/SD	43 (11)	42 (12)	38 (12)
Gender			
Female			
Sample Size	n = 123 ; % = 82	n = 126 ; % = 78	n = 113 ; % = 81
Ethnicity			
Dutch			
Sample Size	n = 122 ; % = 82	n = 143 ; % = 89	n = NR ; % = NR
Immigrant			
Sample Size	n = 26 ; % = 18	n = 18 ; % = 11	n = NR ; % = NR

Outcomes

Study timepoints	Baseline 6 (month)

Employee outcomes

	WHS screening and consultation		WHS screening only		WHS screening and E-mental health	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**	**Baseline**	**6 (month)**
	N = 151	N = 151	N = 161	N = 161	N = 139	N = 139
Uptake of support services *Polarity: Not set*						

	WHS screening and consultation		WHS screening only		WHS screening and E-mental health	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**	**Baseline**	**6 (month)**
	N = 151	N = 151	N = 161	N = 161	N = 139	N = 139
No of events	n = 98 ; % = 65	n = 42 ; % = 48	n = 102 ; % = 63	n = 66 ; % = 56.4	n = NR ; % = NR	n = NR ; % = NR
Sample Size	n = 151 ; % = 100	n = 87 ; % = 57.6	n = 161 ; % = 100	n = 117 ; % = 77.5	n = NR ; % = NR	n = NR ; % = NR
Work functioning Reported as number above cutoff on Nurses Work Functioning Questionnaire (NWFQ) *Polarity: Not set*						
No of events	n = 88 ; % = 58	n = 34 ; % = 39.5	n = 110 ; % = 58	n = 60 ; % = 52	n = 91 ; % = 53	n = 19 ; % = 52
Sample Size	n = 151 ; % = 100	n = 86 ; % = 56.9	n = 161 ; % = 100	n = 116 ; % = 72	n = 139 ; % = 100	n = 52 ; % = 37.4
Mental health symptoms Reported as number above cutoff for Depression on Brief Symptom Inventory (BSI) *Polarity: Not set*						
No of events	n = 50 ; % = 33	n = 21 ; % = 25	n = 45 ; % = 28	n = 30 ; % = 26	n = NR ; % = NR	n = NR ; % = NR
Sample Size	n = 151 ; % = 100	n = 85 ; % = 56.3	n = 161 ; % = 100	n = 116 ; % = 72	n = NR ; % = NR	n = NR ; % = NR
Job stress Reported as number above cutoff on Four- Dimensional Symptoms Questionnaire (4DSQ) *Polarity: Not set*						

	WHS screening and consultation		WHS screening only		WHS screening and E-mental health	
	Baseline	**6 (month)**	**Baseline**	**6 (month)**	**Baseline**	**6 (month)**
	N = 151	N = 151	N = 161	N = 161	N = 139	N = 139
No of events	n = NR ; % = NR	n = NR ; % = NR	n = 48 ; % = 30	n = 26 ; % = 22	n = 41 ; % = 30	n = 10 ; % = 19.2
Sample Size	n = NR ; % = NR	n = NR ; % = NR	n = 161 ; % = 100	n = 116 ; % = 72	n = 139 ; % = 100	n = 52 ; % = 37.4

Risk of Bias – Uptake of support services – Screening and consultation vs control

Section	Question	Answer
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias	Risk of bias judgement	Low

Risk of Bias – Work functioning – Screening and consultation vs control

Section	Question	Answer
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low

Section	Question	Answer
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Some concerns
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias	Risk of bias judgement	Some concerns

Risk of Bias – Mental health symptoms – Screening and consultation vs control

Section	Question	Answer
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias	Risk of bias judgement	Low

Risk of Bias – Job stress – Screening and E-mental Health vs control

Section	Question	Answer
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias	Risk of bias judgement	Low

Risk of Bias – Work functioning – Screening and E-mental Health vs control

Section	Question	Answer
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions (If your aim is to assess the effect of assignment to intervention, answer the following questions).	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Some concerns
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias	Risk of bias judgement	Some concerns

TIDieR checklist

WHS screening and consultation (N = 151)

Brief name	Workers' Health Surveillance (WHS) mental module [Gartner 2013, P 1219]
Rationale/theory/Goal	To assess whether the mental module for WHS for nurses and allied health care professionals stimulates help-seeking behaviour and improves work functioning and mental health. [Gartner 2013, P 1219]
Materials used	Screening and optional occupational physician consultation [Gartner 2011, P 5]
Procedures used	Online screening for work functioning impairments and mental health complaints. Feedback was received based on the results of the screening questionnaire. Positively screened workers were invited for a face to face consultation with their occupational physician within 2 weeks. [Gartner 2011, P 5]
Provider	Automated online system for screening [Gartner 2011, P 5] Occupational physician for consultation [Gartner 2011, P 5]
Method of delivery	Online and face to face sessions [Gartner 2011, P 5]
Setting/location of intervention	Workplace (Hospital) [Gartner 2011, P 3]
Intensity/duration of the intervention	Single consultation [Gartner 2013, P 1220]
Tailoring/adaptation	Not reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

WHS screening only (N = 161)

Brief name	Workers' Health Surveillance (WHS) mental module [Gartner 2013, P 1219]

Rationale/theory/Goal	To assess whether the mental module for WHS for nurses and allied health care professionals stimulates help-seeking behaviour and improves work functioning and mental health. [Gartner 2013, P 1219]
Materials used	Screening [Gartner 2011, P 5]
Procedures used	Online screening for work functioning impairments and mental health complaints. The results of the screening-questionnaires were not reported back to participants, and no further interventions advised at baseline. [Gartner 2011, P 5]
Provider	Automated online system for screening [Gartner 2011, P 5]
Method of delivery	Online [Gartner 2011, P 5]
Setting/location of intervention	Workplace (Hospital) [Gartner 2011, P 3]
Intensity/duration of the intervention	Not applicable
Tailoring/adaptation	Not reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

WHS screening and E-mental health (N = 139)

Brief name	E-mental health approach group. {Ketelaar 2013, P 5]
Rationale/theory/Goal	Based on cognitive-behavioural therapy [Gartner 2011, P 5]
Materials used	Online screening, advice, weekly assignments, the option of keeping a diary and a forum to get in contact with peers who have similar complaints. [Gartner 2011, P 5]
Procedures used	Feedback on results will be provided digitally after completion of the screening questionnaire. Workers with impaired work functioning will be digitally offered individually tailored advice on how to improve their work functioning. Furthermore, an electronic health intervention trajectory will be offered to each participant to improve mental health and wellbeing. This

	includes internet based self-help programs aimed at reducing specific mental health complaints or enhancing wellbeing. [Gartner 2011, P 5]
Provider	Not reported
Method of delivery	Online, email and self-help [Gartner 2011, P 5]
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

D.4 Kant 2008

Bibliographic Reference	Kant, Ijmert; Jansen, Nicole W H; van Amelsvoort, Ludovic G P M; van Leusden, Rudy; Berkouwer, Ate; 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; 2008; vol. 18 (no. 1); 79-86

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported
Study start date	Jan-2003

Study end date	Oct-2003
Aim	To assess the efficacy of structured early consultation among employees at high risk for future long-term sickness absence, in the prevention and/or reduction of sickness absence.
Country/geographical location	The Netherlands
Setting	Workplace Private sector Financial industry Large organisation Contract type not specified Seniority not specified
Inclusion criteria	scored above the predefined cut-off point of the Balansmeter, were not absent from work, not pregnant and not receiving treatment by the OP at the time of completing the Balansmeter.
Exclusion criteria	Had left the organization at one point during the follow-up period, as no objective sickness absence data could be obtained for these subjects.
Method of randomisation	Block randomization using a computerized random number generator.
Method of allocation concealment	Randomization sequences were generated by an independent research assistant
Unit of allocation	Individual
Unit of analysis	Individual
Statistical method(s) used to analyse the data	A power calculation indicated that a sample of 145 participants was adequate in both groups to have a power of 0.9 and an alpha of 0.05. An intention- to-treat, modified intention-to-treat and per-protocol basis analyses were conducted. Poisson regression analyses were used to test differences in sickness absence duration and sickness absence frequency.
Attrition	4,950 of 9,863 employees (50.2%) responded to the questionnaire. 299 employees fulfilled the inclusion criteria and were included in the study. 99/147 (32.6) in the intervention group and 21/152(13.8%) of the control group were missing from per protocol analysis

Study limitations (author)	The observed incidence of sickness absence in the study was much lower than expected. Quite a few subjects in the experimental group had already sought treatment before the consult with the OP. These people had excluded from the analysis which may have resulted in an overestimation of the results, if these employees would be characterized by a higher level of complaints This study is not fully representative for the general working population
Source of funding	Care and Public Health Research Institute, Maastricht, the Netherlands, ABN AMRO Arbo Services, Amsterdam, the Netherlands.

Study arms

Structured early consultation (N = 132)
Usual care (N = 131)

Characteristics

Arm-level characteristics

	Structured early consultation (N = 132)	**Usual care (N = 131)**
Age Completers only		
Mean/SD	46.32 (8.4)	46.58 (8.28)
Gender Completer's only		
Male		
Sample Size	% = 73.5	% = 68.7
Ethnicity Not reported		
Socioeconomic status Completer's only - Reported as educational level		

	Structured early consultation (N = 132)	Usual care (N = 131)
Low		
Sample Size	% = 40.5	% = 40.6
Medium		
Sample Size	% = 48.1	% = 34.9
High		
Sample Size	% = 11.5	% = 15.5

Outcomes

Study timepoints	12 (month)

Employer outcomes

	Structured early consultation	Usual care
	12 (month)	12 (month)
	N = 132	N = 131
absenteeism *(days)* Reported as Total sickness absence duration *Polarity: Lower values are better*		
Mean/SD	25.97 (44.84)	31.13 (55.47)

Risk of Bias - Absenteeism

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
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	Some concerns

TIDieR checklist

Structured early consultation (N = 147)

Brief name	Structured early consultation with an occupational physician [P 80]
Rationale/theory/Goal	To intervene before sickness absences occurs [P 81]
Materials used	Consultation with occupational physician [P 81]
Procedures used	Structured early consultation was conducted according to a protocol, capturing several steps. Step 1 = clarification of the main symptoms and complaints. This was done by going through the individual Balansmeter results and personal accounts of covering social, medical, private and work factors. Step 2 = explanation of the relationship between these symptoms and risk of future long-term sickness absence. Step 3 = explanation and discussion of the expectations and benefits of early treatment for the employee. This consult may then result in a targeted intervention focusing at the specific complaints presented by the employee. [P 81]
Provider	Occupational physician [P 81]
Method of delivery	Face to face consultation [P 81]
Setting/location of intervention	Workplace [P 81]
Intensity/duration of the intervention	Single session of 1.5 hours [P 81]

Tailoring/adaptation	Not reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

Usual care (N = 152)

Brief name	Usual care [P 82]
Rationale/theory/Goal	Not applicable
Materials used	Not applicable
Procedures used	Not applicable
Provider	Occupational services [P 82]
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 Kawakami 1997

Bibliographic Reference	Kawakami, N; Araki, S; Kawashima, M; Masumoto, T; Hayashi, T; Effects of work-related stress reduction on depressive symptoms among Japanese blue-collar workers.; Scandinavian journal of work, environment & health; 1997; vol. 23 (no. 1); 54-59

Study details

Study design	Non-randomised controlled trial (NRCT)
Trial registration number	Not reported
Study start date	1986
Study end date	1987
Aim	To determine the effects of the stress reduction program on depressive symptoms
Country/geographical location	Japan
Setting	Workplace (Electronics company)
Inclusion criteria	Worksites with mean depression scores higher than the mean plus 1 standard deviation for the entire sample
Exclusion criteria	Not reported
Method of randomisation	Not applicable
Method of allocation concealment	Not applicable
Unit of allocation	Worksite
Unit of analysis	Individual
Statistical method(s) used to analyse the data	An analysis of covariance (ANCOVA) of repeated measurements was used to assess the intervention effect. Analyses were conducted using the GLM procedure of the SAS version 6.04. Generalized logit analysis with repeated measurements was used to assess the intervention effect on sick leave and the 6 work stressors
Attrition	32/111 (28.8%) in the intervention group and 78/186 (41.9%) in the control group were lost to follow-up

Study limitations (author)	Selected questions on work stressors only covered a very limited area of work stress Assessments of depressive symptoms and sick leave were self-reported
Source of funding	Not reported

Study arms

Stress reduction programme (N = 111)
Usual care (N = 186)

Characteristics

Arm-level characteristics

	Stress reduction programme (N = 111)	**Usual care (N = 186)**
Age		
Mean/SD	33 (12)	35 (12)
Gender		
Male		
Sample Size	n = 84 ; % = 76	n = 104 ; % = 56
Ethnicity Not reported		

Outcomes

Study timepoints	Baseline 2 (year)

Employee outcomes

	Stress reduction programme		Usual care	
	Baseline	**2 (year)**	**Baseline**	**2 (year)**
	N = 111	**N = 111**	**N = 186**	**N = 186**
Mental health symptoms Reported as Depression using Zung SDS *Polarity: Lower values are better*				
Sample Size	n = 111 ; % = 100	n = 79 ; % = 71.2	n = 186 ; % = 100	n = 108 ; % = 58.1
Mean/SD	41.4 (7.7)	38.6 (6.4)	41.2 (7.1)	41.7 (7.3)
Job stress Reported as 'work overload' *Polarity: Not set*				
No of events	n = 26 ; % = 23.4	n = 34 ; % = 43	n = 26 ; % = 14	n = 28 ; % = 26
Sample Size	n = 111 ; % = 100	n = 79 ; % = 71.2	n = 186 ; % = 100	n = 108 ; % = 58.2
absenteeism Reported as sick leave *Polarity: Not set*				
No of events	n = 67 ; % = 60	n = 31 ; % = 39	n = 87 ; % = 47	n = 46 ; % = 42
Sample Size	n = 111 ; % = 100	n = 79 ; % = 71.2	n = 186 ; % = 100	n = 108 ; % = 58.1

Risk of Bias – Mental health symptoms

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

Section	Question	Answer
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
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	Low

Risk of Bias – Job stress

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
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	Low

Risk of Bias - Absenteeism

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

Section	Question	Answer
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
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	Low

TIDieR checklist

Stress reduction programme (N = 111)

Brief name	Work-related stress reduction program [P 55]
Rationale/theory/Goal	Not reported
Materials used	None
Procedures used	A working committee (worksite supervisors, corporate medical staff, a mental health professional, an industrial physician, public health nurses, psychologists and employees) A survey on stress was conducted and the medical staff explained the results emphasizing the need for stress reduction programme, Supervisors were asked to identify work stressors and make possible plans to reduce the stressor. Stressors and solutions included overtime due to poor performance of production machines - machinery speed and performance was improved, number of checkpoints needed when starting or stopping machines - number of checkpoints reduced, 'out of date' skills - on the job training (not fully implemented) supervisor/worker ratio - additional subleaders trained and placed between supervisors and works in order to create smaller work units) [P 56]
Provider	Not applicable
Method of delivery	Not applicable
Setting/location of intervention	Workplace (Electronics company production line) [P 55]
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

Usual care (N = 186)

Brief name	Usual care [P 55]
Rationale/theory/Goal	Not applicable
Materials used	Not applicable
Procedures used	No particular activity reducing work stress was conducted in the reference group.[P 55]
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.6 Luthar 2017

Bibliographic Reference	Luthar, Suniya S; Curlee, Alexandria; Tye, Susannah J; Engelman, Judith C; Stonnington, Cynthia M; Fostering Resilience among Mothers under Stress: "Authentic Connections Groups" for Medical Professionals.; Women's health issues : official publication of the Jacobs Institute of Women's Health; 2017; vol. 27 (no. 3); 382-390

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	NCT02540473
Study start date	Feb-2015
Study end date	Nov-2015
Aim	To assess the effect of a peer group intervention to foster resilience among professional women at high risk for stress and burnout.
Country/geographical location	US
Setting	Workplace Public sector Healthcare industry Large organisation Contract type - not specified Seniority - not stated
Inclusion criteria	professional women who had at least one child 18 years of age or younger.
Exclusion criteria	Not reported
Method of randomisation	Not reported
Method of allocation concealment	Blinded assignment. No further details given
Unit of allocation	Individual
Unit of analysis	Individual

Statistical method(s) used to analyse the data	ANCOVAs were conducted to test the effect of the intervention on psychological variables. Partial eta square values of 0.02, 0.13, and 0.26 are considered small, medium, and large effect sizes, respectively Paired t tests were used at both post-treatment and follow-up
Attrition	No dropouts
Study limitations (reviewer)	Future studies should also include booster sessions for the intervention. The study should also had a third group with no released time in the design to ascertain any improvements owing to naturally occurring changes, rather than those deriving from weekly freed time or any intervention. Limitations in the measurement of cortisol.
Source of funding	Arizona State University. Mayo Clinic funded and supported medical-care professionals' time to participate in study activities.

Study arms

Authentic Connections Groups (N = 21)
Protected time (N = 19)

Characteristics

Arm-level characteristics

	Authentic Connections Groups (N = 21)	**Protected time (N = 19)**
Age		
Mean/SD	38.76 (6.13)	39.39 (4.83)
Gender		
Female		
Sample Size	n = 21 ; % = 100	n = 19 ; % = 100
Ethnicity Not reported		

Outcomes

Study timepoints	3 (month)

Employee outcomes

	Authentic Connections Groups	Protected time
	3 (month)	3 (month)
	N = 21	N = 19
Job stress (partial eta square = .08) Reported as Maslach Burnout Inventory - emotional exhaustion Polarity: Lower values are better		
Custom value	0.08	0
Mental health symptoms (partial eta square = .17) Reported as Depression using Beck Depression Inventory Polarity: Not set		
Custom value	0.17	0
Mental wellbeing (partial eta square = .12) Reported as Brief Symptom Index Polarity: Not set		
Custom value	0.12	0

Risk of Bias – Job stress

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
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

Risk of bias – Mental wellbeing

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
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

Risk of bias – Mental health symptoms

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	Low
Overall bias	Risk of bias judgement	Low

Study arms

Authentic Connections group (N = 21)

Brief name	Authentic Connections Groups [P 383]
Rationale/theory/Goal	Based on relational psychotherapy which aims to to facilitate authentic, supportive relationships among mothers. [P383 - 383]
Materials used	Discussion topics and exercises [P 384]
Procedures used	Meetings were based in respect, empathy, and empowerment, and were led by a skilled female group facilitator trained in the manualized procedures. [P 384]
Provider	Psychiatrist [P 384]
Method of delivery	Group face to face [384]
Setting/location of intervention	Workplace (Hospital)
Intensity/duration of the intervention	1 hours session per week for 3 months [P 384]
Tailoring/adaptation	None reported
Unforeseen modifications	None reported

Planned treatment fidelity	weekly supervision meetings ensure fidelity to manual procedures and group participants also rated the clinician after the intervention to gauge fidelity. [P 384]
Actual treatment fidelity	Participants completed the clinician's Adherence Rating Scale and fidelity was high across all 11 items (M = 4.61). [P 384]

Protected time (N = 19)

Brief name	Protected time to be used as they chose [P 384]
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	Workplace (Hospital)
Intensity/duration of the intervention	1 hour per week for 12 weeks
Tailoring/adaptation	Not applicable
Unforeseen modifications	Not applicable
Planned treatment fidelity	Not applicable
Actual treatment fidelity	Not applicable

D.7 Ricou, 2018

Bibliographic Reference	Ricou, B.; Gigon, F.; Durand-Steiner, E.; Liesenberg, M.; Chemin-Renais, C.; Merlani, P.; Delaloye, S.; Initiative for Burnout of ICU Caregivers: Feasibility and Preliminary Results of a Psychological Support; Journal of Intensive Care Medicine; 2018

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	ClinicalTrials.gov (identifier NCT01959750).
Study start date	Apr-2009
Study end date	Mar-2010
Aim	Assess the feasibility and the impact of a psychological intervention on the levels of anxiety, depression, and burnout in ICU caregivers.
Country/geographical location	Switzerland
Setting	Workplace - 36-bed medico surgical ICU of a university-affiliated hospital Sector - not reported. Industry - healthcare Large organisation Contract type - Not reported. Seniority - Nursing auxiliary (20%), student nurse (27%); Certified nurse (50%); Managing nurse (4%)
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Method of randomisation	Randomization was performed using http://www.randomizer.org
Method of allocation concealment	After informed consent, allocation undertaken via received sealed opaque envelopes randomly assigning participants to either a control group or an intervention group; The investigators were blind to the attribution of the caregivers to the groups

Unit of allocation	Individual
Unit of analysis	Individual
Statistical method(s) used to analyse the data	Mean/SD; Data were compared using the Student t test (paired or unpaired, as indicated) for normally distributed continuous data and using Fisher exact test for categorical variables. For multiple comparisons (comparison of the 3 time points [Before, After, and at 6 months] or the 4 time periods [Before, During, After, and at 6 months]), the paired t test with Bonferroni correction, analysis of variance for repeated measures, or Kruskal-Wallis depending on the distribution of data, or multiple chi-squared test (for independence or trend) for categorical variables were used.
Attrition	Intervention completion 111/166 (67%); 83/166 (50%) provided data post intervention; 51/166 (31%) provided data at 6 months
Study limitations (author)	The participation rate of 67% of the randomized caregivers was considered 'poor' and may have impacted study findings. The reasons for poor participation were not investigated. The methodological modification that occurred meant that the number of sessions that caregivers could attend varied potentially impacting the psychological intervention. The small number of participants remaining at the end of the study, due to the high departure rate, precluded the comparability of the groups at 6 months - the study specifies that in order to distinguish any difference in the degree of burnout, the minimal necessary number of participants per group was 47 which could not be achieved for at the 'After' (n=41 and n=42) phase of the intervention. The potential bias due to caregivers leaving the service because of burnout cannot be excluded, since their mental health could not be investigated. The causes of absenteeism are not known as the study was not designed to assess this.
Study limitations (reviewer)	The study does not specify inclusion and exclusion criteria; 33% attrition post randomization and subsequent impact on study power for primary outcome (<10% power); Change in intervention procedure 3 months into the study may have impacted its efficacy and this has not been adjusted for in the analysis.
Source of funding	Not reported

Study arms

Psychological support intervention (N = 85)
Systemic approach inspired from a problem-based learning method aiming at the personnel empowerment at the workplace. The method addresses complex systems where the variable interaction between individuals infers the mode of functioning of the system.

Control (N = 81)

No details reported.

Characteristics

Study-level characteristics

Characteristic	Study (N = 111)
40 or older (%) Nominal	70
</= 40 (%) Nominal	30
Gender % Male Nominal	21
Ethnicity Nominal	NR

Outcomes

Study timepoints

Baseline

3 month (3 months after the intervention)

6 month (6 months after the intervention)

Burnout (Total score of the Total Maslach Inventory of Burnout)

Outcome	Psychological support intervention, Baseline, N = 47	Psychological support intervention, 3 month, N = 41	Psychological support intervention, 6 month, N = 27	Control, Baseline, N = 57	Control, 3 month, N = 42	Control, 6 month, N = 24
Burnout (total score) Mean (SE)	-16.1 (2.8)	-19.4 (2.6)	-12.6 (3.6)	-13.9 (2.5)	-18 (2.5)	-14.1 (4.1)

Burnout (total score) - Polarity - Higher values are better.

Total Maslach Inventory of Burnout (MBI - Fontaine French version); 22 questions on a 7-point Likert scale (0-6). This tool measures the 3 dimensions of burnout independently: emotional exhaustion, depersonalization, and personal accomplishment. A severe burnout can also be defined as the cumulated score of MBI of >-9.

Hospital Anxiety and Hospital Depression

Outcome	Psychological support intervention, Baseline, N = 51	Psychological support intervention, 3 month, N = 41	Psychological support intervention, 6 month, N = 27	Control, Baseline, N = 57	Control, 3 month, N = 40	Control, 6 month, N = 23
Hospital Anxiety Mean (SE)	6.8 (0.5)	5.9 (0.6)	6.4 (0.7)	7.1 (0.5)	6.9 (0.5)	7.1 (0.8)
Hospital Depression Mean (SE)	3.4 (0.4)	3.4 (0.4)	3.6 (0.6)	4.4 (0.5)	4 (0.5)	4 (0.7)

Hospital Anxiety - Polarity - Lower values are better.

Hospital Depression - Polarity - Lower values are better.

French version of the Hospital Anxiety and Depression Scale (HADS); 14 self-rated items using a 4-point Likert scale (0-3). The subscale scores of HA and HD range, respectively, from 0 to 7 (no distress), 8 to 10 (borderline), 11 to 15 (significant), and 16 to 21 (severe distress).

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

Burnout (Total score of the Total Maslach Inventory of Burnout) – Burnout (total score) – Mean SE - Psychological support intervention - Control-t3

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*
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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*

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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Burnout (Total score of the Total Maslach Inventory of Burnout)- Burnout (total score) – Mean SE - Psychological support intervention-Control-t6

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*

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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*
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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Hospital Anxiety and Hospital Depression -Hospital Anxiety – Mean SE - Psychological support intervention - Control-t3

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*
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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*
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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Hospital Anxiety and Hospital Depression – Hospital Anxiety – Mean SE - Psychological support intervention-Control-t6

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*
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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*
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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Hospital Anxiety and Hospital Depression – Hospital Depression – Mean SE - Psychological support intervention-Control-t3

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*
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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*
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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Hospital Anxiety and Hospital Depression -Hospital Depression- Mean SE-Psychological support intervention-Control-t6

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Randomization process specified; Allocation concealed via sealed opaque envelope distribution; investigators blind to allocation; Lack of statistical analysis of sample distribution post randomization)*
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 *(Randomisation, blinding and allocation concealment outlined although details are brief; ITT undertaken for all analysis;)*
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)	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which are highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(The >30% raises concerns regarding the sample size and the power of the study to detect the changes proposed; All participants randomized are accounted for)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Data collected via validated self-report questionnaires; researchers were blinded to intervention allocations)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(A pre-specified plan is not outlined specifically but what has been outlined in the study narrative has been adhered to in terms of method, process and analysis)*
Overall bias	Risk of bias judgement	Some concerns *(Randomization, blinding and allocation were undertaken. There was a change in the way the intervention was delivered after 3 months which is highlighted as a limitation. The potential impact on participants is unclear and no differentiation is made in the analysis between participants who undertook the initial version of the intervention and the subsequent version. There were differences in session length and duration of exposure. The >30% attrition post randomization raises concerns regarding the sample size and the power of the study to detect the changes proposed;)*

Study arms

Psychological support intervention (N = 85)

Brief name	Psychological support intervention
Rationale/theory/Goal	The intervention is focused on problem-based learning method aiming at the personnel empowerment at the workplace. The method addresses complex systems where the variable interaction between individuals infers the mode of functioning of the system.
Materials used	60-minute sessions that allowed a reflection space that allows the construction of a collective knowledge about the causes of exhaustion and the possible solutions for this unique to the team; 2 psychologists moderated the discussions initiated from problems raised by the caregivers using a systemic approach;
Procedures used	The general intervention framework consisted in a systemic intervention that is built on the following principles: allowing the group or the team to find its own definition of the problem and define the particular factors of exhaustion for the team itself.
Provider	Two Psychologists
Method of delivery	Group discussions moderated and planned by psychologists lasting for 60 minutes
Setting/location of intervention	In the workplace
Intensity/duration of the intervention	Initially employee arranged monthly 60 minute sessions in groups of 5 to 6 which changed to compulsory 60 minute session whose content was modified in order to encourage discussions and exchange of opinions with psychologists preparing each session with the themes new groups were constituted weekly with 8 to 10 caregivers present in the ICU.
Tailoring/adaptation	After a period of 3months (April 2009 to June 2009), the planned design of the study was not suitable for the ICU context (caregivers could not attend the sessions due to work constraints or did not want to come back during their time off). The intervention was modified: sessions occurred within working hours, was compulsory, with the 60 minute session modified based on the initial 3 months of implementation to encourage discussions. Group sizes changed from 5-6 to 8-10.
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported
Other details	Not reported

Systemic approach inspired from a problem-based learning method aiming at the personnel empowerment at the workplace. The method addresses complex systems where the variable interaction between individuals infers the mode of functioning of the system.

Control (N = 81)

Brief name	Control

Rationale/theory/Goal	Not applicable
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	Nor reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported
Other details	Not reported

D.8 Peterson 2008

Bibliographic Reference	Peterson, Ulla; Bergstrom, Gunnar; Samuelsson, Mats; Asberg, Marie; Nygren, Ake; Reflecting peer-support groups in the prevention of stress and burnout: randomized controlled trial.; Journal of advanced nursing; 2008; vol. 63 (no. 5); 506-16

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported
Study start date	Sep-2002
Study end date	Feb-2004

Aim	To test the effect of participating in a reflecting peer-support group on self-reported health and burnout.
Country/geographical location	Sweden
Setting	Workplace Public sector Healthcare industry Large organisation Contract type - Not specified Seniority - Mixed
Inclusion criteria	score above the 75th percentile in the exhaustion dimension of the Oldenburg Burnout Inventory (OLBI)
Exclusion criteria	None reported
Method of randomisation	Computerised randomisation using SAS
Method of allocation concealment	Not reported
Unit of allocation	Individual
Unit of analysis	Individual
Statistical method(s) used to analyse the data	Differences in perceived change in work conditions were estimated by comparing proportions of respondents and were tested for statistical significance of the differences (D) on the basis of 95% confidence intervals. Differences in change of scores for burnout (exhaustion and disengagement), anxiety, depression, quantitative demands, general health and vitality were compared using ANCOVA, with scores at T4 (12-month follow-up) as the dependent variable, and T1 (pre-treatment) scores as the covariate. ANCOVA using T0 (baseline) scores as covariate were also performed. All statistical analyses were performed using the SPSS 15.0 Qualitative content analysis was used to analyse the themes discussed in the groups,
Attrition	17/64 (26.6%) of the intervention group and 23/87 (27.6%) of the control group were lost to follow-up
Study limitations (author)	Not possible to draw any conclusions about the usefulness of the method for men as the majority of participants were women. low percentage of respondents who agreed to participate (22.9%) use of self-report data
Source of funding	County Council

	Afa insurance company

Study arms

Peer support group (N = 64)
No intervention (N = 87)

Characteristics

Arm-level characteristics

	Peer support group (N = 64)	No intervention (N = 87)
Age (years)		
Mean/SD	52.7 (5.6)	50.7 (6.7)
Gender		
Female		
Sample Size	n = 49 ; % = 96.1	n = 67 ; % = 83.8
Ethnicity Not reported		
Socioeconomic status - Reported as supervisor level		
Supervisee		
Sample Size	n = 57 ; % = 86.1	n = 73 ; % = 82
Supervisor		
Sample Size	n = 7 ; % = 13.9	n = 14 ; % = 18

Outcomes

Study timepoints	Baseline 12 (month)

Employee outcomes

	Peer support group		No intervention	
	Baseline	12 (month)	Baseline	12 (month)
	N = 64	N = 64	N = 87	N = 87
Job stress Reported as Oldenburg Burnout Inventory (OLBI) - exhaustion Polarity: Lower values are better				
Sample Size	n = 64 ; % = 100	n = 47 ; % = 73.4	n = 87 ; % = 100	n = 63 ; % = 72.4
Mean/SD	3.03 (0.32)	2.51 (0.46)	3 (0.27)	2.67 (0.39)
Mental health symptoms Reported using Hospital Anxiety and Depression Scale (HADS) - depression Polarity: Lower values are better				
Sample Size	n = 64 ; % = 100	n = 47 ; % = 73.4	n = 87 ; % = 100	n = 63 ; % = 72.4
Mean/SD	6.84 (3.26)	6.06 (4.54)	7.27 (3.91)	7.13 (3.7)

Risk of Bias – Job stress

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
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

Risk of Bias – Mental health symptoms

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
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

TIDieR checklist

Peer support group (N = 64)

Brief name	Peer support group [P 509]
Rationale/theory/Goal	Based on problem-based method [P 509]
Materials used	Group sessions and a manual was formulated describing the aim and background to the intervention and a description of each point in the method.[P 509]
Procedures used	The peer-support group was intended to be a working group, and not a therapeutic group, and the purpose with the reflecting peer-support group was the following: • To provide an opportunity for discussion and reflection with colleagues, focusing on work-related stress and burnout, with one's own unique situation and experience as starting point. • To provide an opportunity for mutual support between colleagues, to share and compare experiences with colleagues, and also learn from each other. • To work with individual goals for change to find out alternative ways to handle perceived stressful situations. [P 509]
Provider	The group leaders were preferably recruited from the occupational health service and included physicians, social workers or physiotherapists with previous group leader experience. [P 509]
Method of delivery	Face to face [P 509]
Setting/location of intervention	Workplace [P 509]
Intensity/duration of the intervention	10 sessions, with a follow-up meeting after 4 weeks, and each session lasted for 2 hours [P 509]

Tailoring/adaptation	Not reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

No intervention (N = 87)

Brief name	No intervention [P 508]
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.9 Rothermund 2016

Bibliographic Reference	Rothermund, Eva; Gundel, Harald; Rottler, Edit; Holzer, Michael; Mayer, Dorothea; Rieger, Monika; Kilian, Reinhold; Effectiveness of psychotherapeutic consultation in the workplace: a controlled observational trial.; BMC public health; 2016; vol. 16; 891

Study details

Study design	Non-randomised controlled trial (NRCT)
Trial registration number	DRKS00003184
Study start date	Nov-2011
Study end date	Jun-2013
Aim	To compare the effectiveness of the PSIW (psychotherapeutic consultation in the workplace) program with PSOC (psychotherapeutic outpatient care) as a measure of routine care
Country/geographical location	Germany
Setting	Workplace Sector - Not specified Industry - Not specified Size - Not specified Contract type - Not specified Seniority - Not specified
Inclusion criteria	At least 18 years old, capable of understanding and writing German currently employed. Participants in the PSIW group had to be employed by one of the participating companies.
Exclusion criteria	None reported
Method of randomisation	Not applicable

Method of allocation concealment	Not reported
Unit of allocation	Individual
Unit of analysis	Individual
Statistical method(s) used to analyse the data	Power calculation suggested that a sample of 220 participants would be needed to detect a medium (effect size f = 0.25) difference in work ability index (WAI) with a power of 0.95 at a significance level of $p < 0.05$ using repeated measures ANOVA. Intention to treat (ITT) analysis as used. Missing endpoint data were imputed as last observation carried forward (LOCF). Change in outcome indicators was analysed by covariance analysis with repeated measures (ANCOVA) with propensity scores as covariates.
Attrition	58/174 (33.3%) in the intervention group and 76/193 (39.4%) in the control group were lost to follow-up
Study limitations (author)	lack of a randomised group high loss to follow-up
Source of funding	German network “Health Services Research Baden-Wuerttemberg” of the Ministry for Science, Research and Arts in collaboration with the Ministry for Work and Social Affairs, Family, Women, and Senior Citizens, Baden-Wuerttemberg and by the company Airbus.

Study arms

Psychotherapeutic consultation (N = 174)
Routine care (N = 193)

Characteristics

Arm-level characteristics

	Psychotherapeutic consultation (N = 174)	Routine care (N = 193)
Age		
Mean/SD	45.2 (10.12)	40.05 (10.07)
Gender		
Male		
No of events	n = 122 ; % = 70.1	n = 66 ; % = 34.2

	Psychotherapeutic consultation (N = 174)	Routine care (N = 193)
Ethnicity Not reported		

Outcomes

Study timepoints	Baseline 12 (week)

Employee outcomes

	Psychotherapeutic consultation		Routine care	
	Baseline	12 (week)	Baseline	12 (week)
	N = 174	N = 174	N = 193	N = 193
Mental health symptoms Depression resorted using Patient Health Questionnaire (PHQ-9) Polarity: Lower values are better				
Sample Size	n = 159 ; % = 91.4	n = 111 ; % = 63.8	n = 180 ; % = 82.9	n = 114 ; % = 59.1
Mean/SD	11.2 (5.71)	9.6 (6.05)	13.3 (6.24)	12.4 (6.44)
Job stress Reported as Maslach Burnout Inventory - Emotional exhaustion Polarity: Lower values are better				
Sample Size	n = 162 ; % = 93.1	n = 113 ; % = 64.9	n = 168 ; % = 87	n = 104 ; % = 53.9
Mean/SD	3.9 (1.27)	3.8 (1.27)	4.5 (1.24)	4.3 (1.18)
productivity Reported using Work Ability Index Polarity: Higher values are better				
Sample Size	n = 146 ; % = 83.9	n = 106 ; % = 60.9	n = 176 ; % = 91.2	n = 108 ; % = 56
Mean/SD	29.5 (8.02)	30.8 (8.32)	25.3 (9.07)	26.8 (9.21)
Mental wellbeing SF-12 Mental component score Polarity: Higher values are better				
Sample Size	n = 145 ; % = 83.3	n = 109 ; % = 62.6	n = 175 ; % = 90.7	n = 107 ; % = 55.4
Mean/SD	33.3 (11.13)	37.5 (11.77)	29.8 (10.24)	32.7 (11.07)

Risk of Bias – Mental health symptoms

Section	Question	Answer
1. Bias due to confounding	Risk of bias judgement for confounding	Moderate
2. Bias in selection of participants into the study	Risk of bias judgement for selection of participants into the study	Moderate
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	Low
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

Risk of Bias – Job stress

Section	Question	Answer
1. Bias due to confounding	Risk of bias judgement for confounding	Moderate
2. Bias in selection of participants into the study	Risk of bias judgement for selection of participants into the study	Moderate
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	Low
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

Risk of Bias – Job performance

Section	Question	Answer
1. Bias due to confounding	Risk of bias judgement for confounding	Moderate
2. Bias in selection of participants into the study	Risk of bias judgement for selection of participants into the study	Moderate
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	Low

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

Risk of Bias – Mental wellbeing

Section	Question	Answer
1. Bias due to confounding	Risk of bias judgement for confounding	Moderate
2. Bias in selection of participants into the study	Risk of bias judgement for selection of participants into the study	Moderate
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	Low
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

Study arms

Psychotherapeutic consultation (N = 174)

Brief name	Psychotherapeutic consultation in the workplace [P 3]
Rationale/theory/Goal	Workplace adaption of a standard form of mental health treatment, short-term psychotherapeutic outpatient care. [P 2]
Materials used	None
Procedures used	Staff members are informed about the service by the company physician. In one company employees must be referred to PSIW by the company physician but in others self-referral is possible. First session (assessment) is used to determine severity of the mental health problem and whether workplace consultation is a suitable treatment option or whether additional or more intensive mental health care is needed. After assessment the user is informed about any further therapeutic steps that are indicated, including providing the user with information about common mental disorders and psychotherapeutic approaches to treatment. The strengths and resources of the patient are stressed and further treatments are recommended. If appropriate information about self-help books, counselling centres, and other services such as workshops on relaxation techniques is provided. [P 3]
Provider	Medical or psychological psychotherapist. [P 3]

Method of delivery	Face to face [P 3]
Setting/location of intervention	Workplace [organisations not reported) [P 2]
Intensity/duration of the intervention	Each session lasts 50–60 minutes and a maximum of four sessions can be offered under the PSIW programme. [P 3]
Tailoring/adaptation	None reported
Unforeseen modifications	None reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

Routine care (N = 193)

Brief name	Routine care is psychotherapeutic outpatient care [P3]
Rationale/theory/Goal	Not reported
Materials used	None reported
Procedures used	Referral to PSOC is predominantly via GPs. Self-referral is also encouraged and information for patients drafted via the clinic websites. Initial PSOC treatment is limited to two sessions and the core elements are assessment of clinical symptoms and service needs, provision of information about common mental disorders and treatment methods and recommendations for further treatment. [P 3]
Provider	Generally PSOC is provided by physicians specialising in psychiatry or psychosomatic medicine or by psychological psychotherapists. [P 2]
Method of delivery	Face to face [P 3]
Setting/location of intervention	Outpatient clinic [P 2]

Intensity/duration of the intervention	Two sessions [P 3]
Tailoring/adaptation	Not reported
Unforeseen modifications	Not reported
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

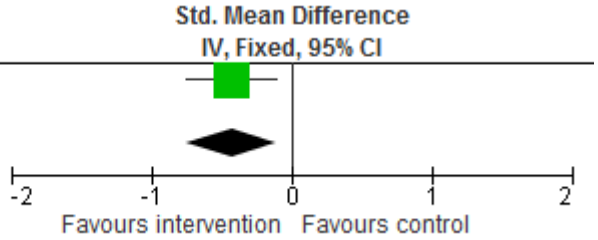
Appendix E – Forest plots

E.1 Screening and intervention vs screening only

E.1.1 Mental wellbeing

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Farzanfar 2011	-10.9	10.1	77	-6	12.7	75	100.0%	-0.43 [-0.75, -0.10]
Total (95% CI)			**77**			**75**	**100.0%**	**-0.43 [-0.75, -0.10]**

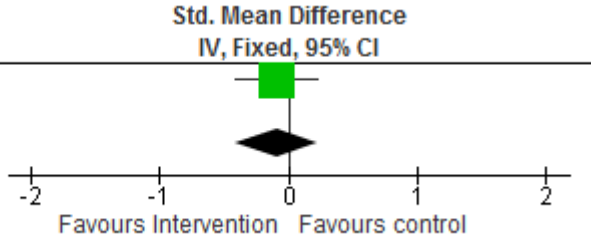
Heterogeneity: Not applicable
Test for overall effect: Z = 2.59 (P = 0.010)



E.1.2 Job stress

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Farzanfar 2011	-2.1	3.4	77	-1.8	3.1	75	100.0%	-0.09 [-0.41, 0.23]
Total (95% CI)			**77**			**75**	**100.0%**	**-0.09 [-0.41, 0.23]**

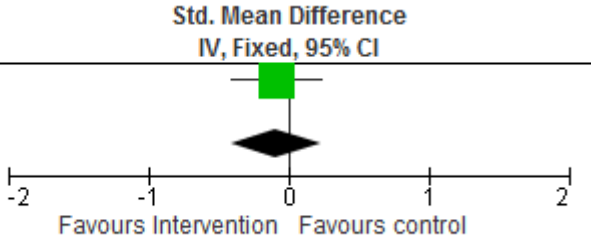
Heterogeneity: Not applicable
Test for overall effect: Z = 0.56 (P = 0.57)



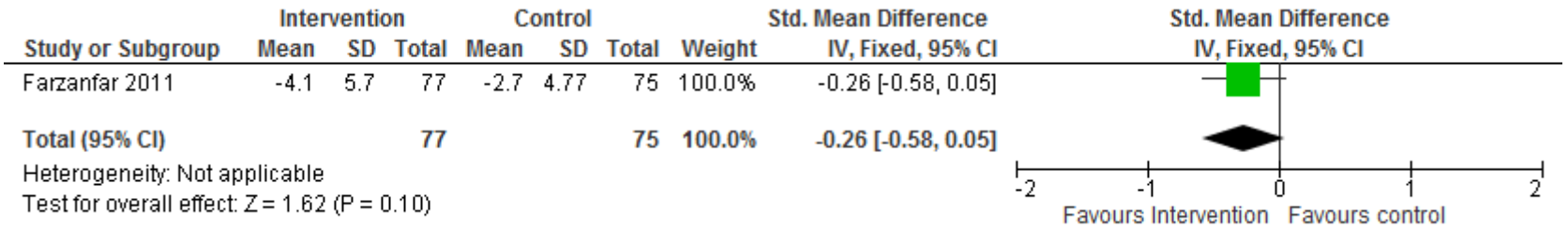
E.1.3 Mental health symptoms

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Farzanfar 2011	-2.2	4.7	77	-1.8	4.5	75	100.0%	-0.09 [-0.40, 0.23]
Total (95% CI)			**77**			**75**	**100.0%**	**-0.09 [-0.40, 0.23]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.53 (P = 0.59)

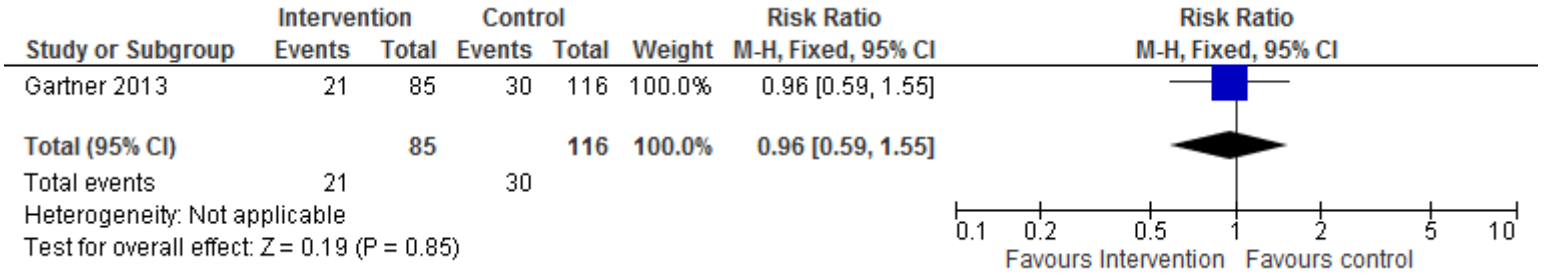


E.1.4 Productivity



E.2 Screening and consultation vs screening only

E.2.1 Mental health symptoms

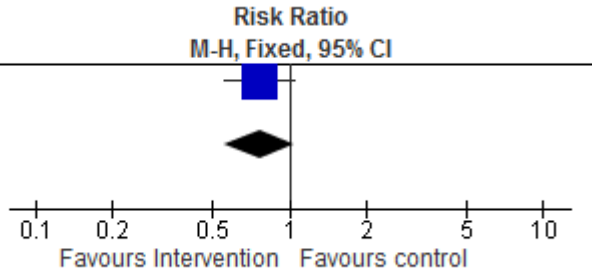


E.2.2 Uptake of support services

E.2.3 Productivity (number with impaired work functioning)

Study or Subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Gartner 2013	34	86	60	116	100.0%	0.76 [0.56, 1.05]
Total (95% CI)		**86**		**116**	**100.0%**	**0.76 [0.56, 1.05]**
Total events	34		60			

Heterogeneity: Not applicable
Test for overall effect: Z = 1.67 (P = 0.09)

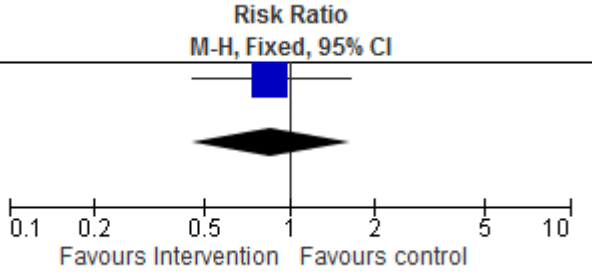


E.3 Screening and E-Mental health vs screening only

E.3.1 Job stress

Study or Subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Gartner 2013	10	52	26	116	100.0%	0.86 [0.45, 1.65]
Total (95% CI)		**52**		**116**	**100.0%**	**0.86 [0.45, 1.65]**
Total events	10		26			

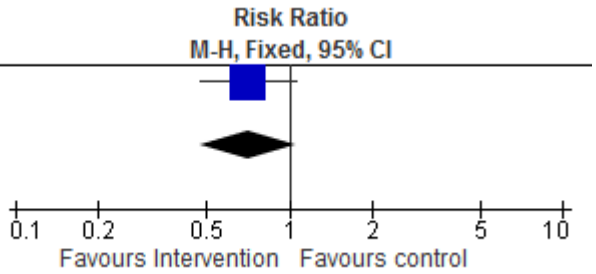
Heterogeneity: Not applicable
Test for overall effect: Z = 0.46 (P = 0.65)



E.3.2 Productivity (Number with impaired work functioning)

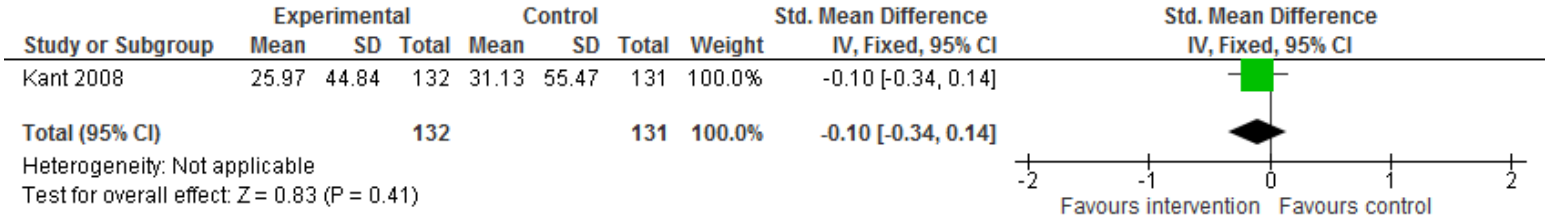
Study or Subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Gartner 2013	19	52	60	116	100.0%	0.71 [0.47, 1.05]
Total (95% CI)		**52**		**116**	**100.0%**	**0.71 [0.47, 1.05]**
Total events	19		60			

Heterogeneity: Not applicable
Test for overall effect: Z = 1.71 (P = 0.09)



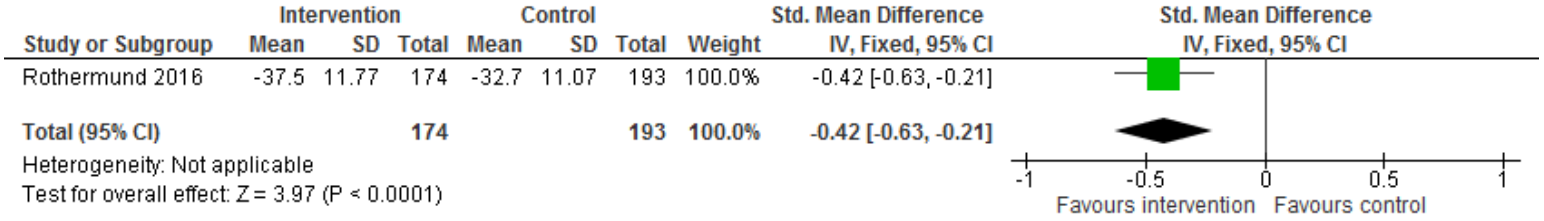
E.4 Structured early consultation vs usual care

E.4.1 Absenteeism

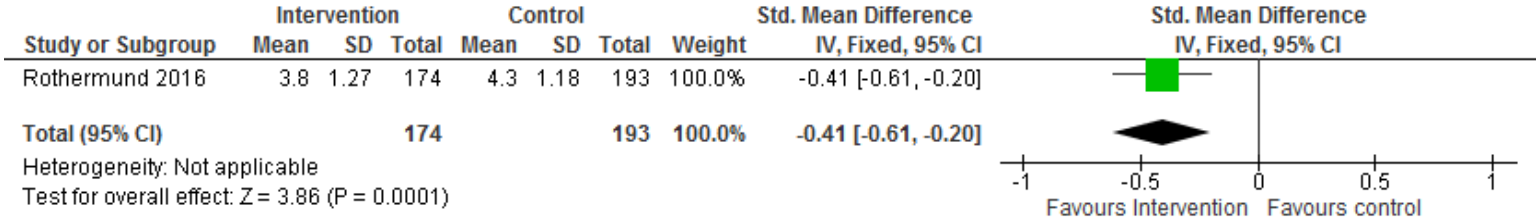


E.5 Workplace consultation vs outpatient consultation

E.5.1 Mental wellbeing



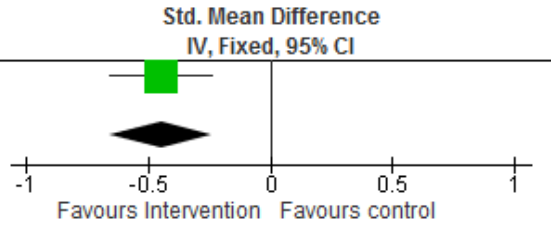
E.5.2 Job stress



E.5.3 Mental health symptoms

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Rothermund 2016	9.6	6.05	174	12.4	6.44	193	100.0%	-0.45 [-0.65, -0.24]
Total (95% CI)			**174**			**193**	**100.0%**	**-0.45 [-0.65, -0.24]**

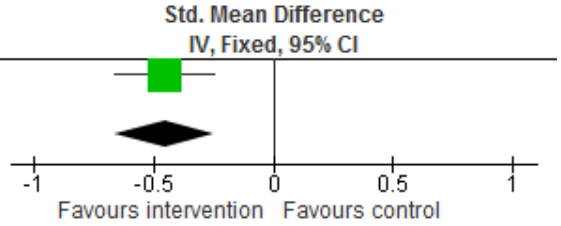
Heterogeneity: Not applicable
Test for overall effect: Z = 4.22 (P < 0.0001)



E.5.4 Productivity

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Rothermund 2016	-30.8	8.32	174	-26.8	9.21	193	100.0%	-0.45 [-0.66, -0.25]
Total (95% CI)			**174**			**193**	**100.0%**	**-0.45 [-0.66, -0.25]**

Heterogeneity: Not applicable
Test for overall effect: Z = 4.28 (P < 0.0001)

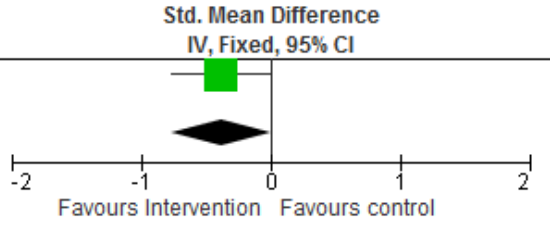


E.6 Peer group vs no intervention

E.6.1 Job stress

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Peterson 2008	2.51	0.46	47	2.67	0.39	63	100.0%	-0.38 [-0.76, 0.00]
Total (95% CI)			**47**			**63**	**100.0%**	**-0.38 [-0.76, 0.00]**

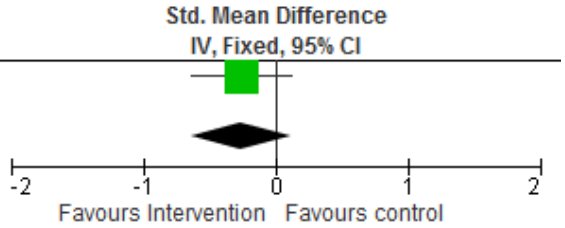
Heterogeneity: Not applicable
Test for overall effect: Z = 1.94 (P = 0.05)



E.6.2 Mental health symptoms

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Peterson 2008	6.06	4.54	47	7.13	3.7	63	100.0%	-0.26 [-0.64, 0.12]
Total (95% CI)			**47**			**63**	**100.0%**	**-0.26 [-0.64, 0.12]**

Heterogeneity: Not applicable
Test for overall effect: Z = 1.35 (P = 0.18)

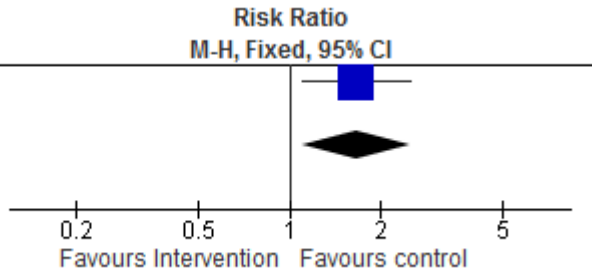


E.7 Stress reduction programme vs usual care

E.7.1 Job stress

Study or Subgroup	Intervention Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Kawakami 1997	34	79	28	108	100.0%	1.66 [1.10, 2.49]
Total (95% CI)		**79**		**108**	**100.0%**	**1.66 [1.10, 2.49]**
Total events	34		28			

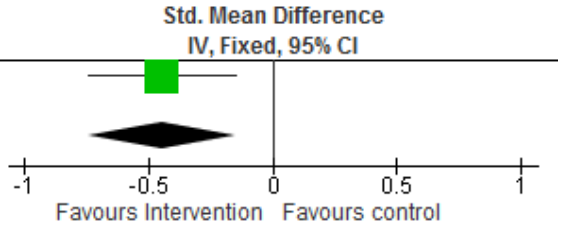
Heterogeneity: Not applicable
Test for overall effect: Z = 2.44 (P = 0.01)



E.7.2 Mental health symptoms

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Kawakami 1997	38.6	6.4	79	41.7	7.3	108	100.0%	-0.45 [-0.74, -0.15]
Total (95% CI)			**79**			**108**	**100.0%**	**-0.45 [-0.74, -0.15]**

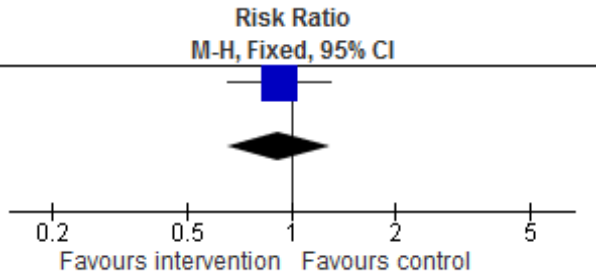
Heterogeneity: Not applicable
Test for overall effect: Z = 2.97 (P = 0.003)



E.7.3 Absenteeism

Study or Subgroup	Intervention Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Kawakami 1997	31	79	46	108	100.0%	0.92 [0.65, 1.31]
Total (95% CI)		**79**		**108**	**100.0%**	**0.92 [0.65, 1.31]**
Total events	31		46			

Heterogeneity: Not applicable
Test for overall effect: Z = 0.46 (P = 0.65)

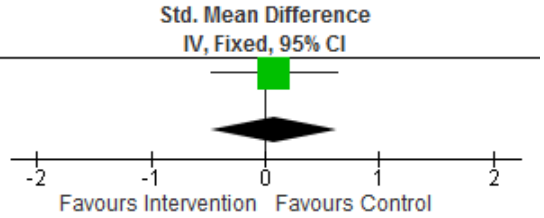


E.8 Psychological support vs control

E.8.1 Job stress

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Ricou 2018	-12.6	18.7061	27	-14.1	20.0858	24	100.0%	0.08 [-0.47, 0.63]
Total (95% CI)			**27**			**24**	**100.0%**	**0.08 [-0.47, 0.63]**

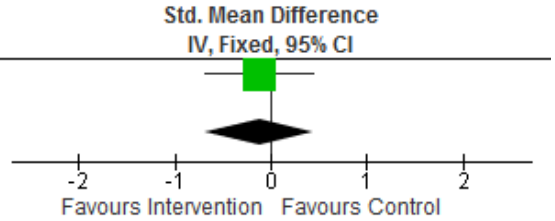
Heterogeneity: Not applicable
Test for overall effect: Z = 0.27 (P = 0.79)



E.8.2 Mental health symptoms

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Ricou 2018	3.6	3.1177	27	4	3.3571	23	100.0%	-0.12 [-0.68, 0.43]
Total (95% CI)			**27**			**23**	**100.0%**	**-0.12 [-0.68, 0.43]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.43 (P = 0.67)



Appendix F - GRADE profiles

F.1.1 Screening and intervention vs screening only

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Screening and intervention	Screening only	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	77	75	-	SMD 0.43 lower (0.75 to 0.1 lower)	⊕⊕⊕O MODERATE
Job stress (Better indicated by lower values)											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[5]	none	77	75	-	SMD 0.09 lower (0.41 lower to 0.23 higher)	⊕⊕OO LOW
Mental health symptoms (Better indicated by lower values)											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[5]	none	77	75	-	SMD 0.09 lower (0.4 lower to 0.23 higher)	⊕⊕OO LOW
Productivity (Better indicated by lower values)											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[5]	none	77	75	-	SMD 0.26 lower (0.58 lower to 0.05 higher)	⊕⊕OO LOW

[1] Serious concern over risk of bias due to self-report measures used
[2] Single-study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect
[5] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.2 Screening and consultation vs screening only

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Screening and consultation vs screening only	Control	Relative (95% CI)	Absolute	
Mental health symptoms											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[4]	none	21/85 (24.7%)	30/116 (25.9%)	RR 0.96 (0.59 to 1.55)	10 fewer per 1000 (from 106 fewer to 142 more)	⊕⊕OO LOW
Uptake of support services											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[5]	none	42/87 (48.3%)	66/117 (56.4%)	RR 0.86 (0.65 to 1.12)	79 fewer per 1000 (from 197 fewer to 68 more)	⊕⊕OO LOW
Productivity											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[4]	none	34/86 (39.5%)	60/116 (51.7%)	RR 0.76 (0.56 to 1.05)	124 fewer per 1000 (from 228 fewer to 26 more)	⊕⊕OO LOW

[1] Serious concern over risk of bias due to self-report measures used
[2] Single-study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.3 Screening and E-mental health vs screening only

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Screening and E-mental health	Screening only	Relative (95% CI)	Absolute	
Job stress											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[4]	none	10/52 (19.2%)	26/116 (22.4%)	RR 0.86 (0.45 to 1.65)	31 fewer per 1000 (from 123 fewer to 146 more)	⊕⊕OO LOW
Productivity											

1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[4]	none	19/52 (36.5%)	60/116 (51.7%)	RR 0.71 (0.47 to 1.05)	150 fewer per 1000 (from 274 fewer to 26 more)	⊕⊕OO LOW

1 Serious concerns over risk of bias due to imbalance in dropout rates and self-report measures used
2 Single study analysis
3 No concerns over directness as study population, intervention and outcomes match review protocol
4 Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.4 Structured early consultation vs usual care

Quality assessment							No of patients		Effect		Quality
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Structured early consultation**	**Usual care**	**Relative (95% CI)**	**Absolute**	
Absenteeism (Better indicated by lower values)											
1	randomised trials	serious[1]	NA[2]	no serious indirectness[3]	serious[4]	none	132	131	-	SMD 0.1 lower (0.34 lower to 0.14 higher)	⊕⊕OO LOW

[1] Serious concern over risk of bias due to missing data
[2] Single study analysis
[3] No concerns over directness as study population, intervention, and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.5 Workplace consultation vs outpatient consultation

Quality assessment							No of patients		Effect		Quality
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Workplace consultation**	**Outpatient consultation**	**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	174	193	-	SMD 0.42 lower (0.63 to 0.21 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	174	193	-	SMD 0.41 lower (0.61 to 0.2 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	174	193	-	SMD 0.45 lower (0.65 to 0.24 lower)	⊕OOO VERY LOW
Productivity (Better indicated by lower values)											
1	observational studies	serious[1]	NA[2]	no serious indirectness[3]	no serious imprecision[4]	none	174	193	-	SMD 0.45 lower (0.66 to 0.25 lower)	⊕OOO VERY LOW

[1] Serious concerns over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect

F.1.6 Peer group vs no intervention

Quality assessment							No of patients		Effect		Quality
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Peer group**	**No intervention**	**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	47	63	-	SMD 0.38 lower (0.76 lower to 0 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	47	63	-	SMD 0.26 lower (0.64 lower to 0.12 higher)	⊕⊕OO LOW

[1] Serious concern over risk of bias due to self-report measures used
[2] Single study analysis

[3] No concerns over directness as study population, intervention, and outcomes match review protocol
[4] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.7 Authentic Connections group vs protected time

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Authentic connections	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	15	14	-	SMD 0.49 lower (1.23 lower to 0.25 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	15	14	-	SMD 0.21 higher (0.52 lower to 0.94 higher)	⊕⊕OO LOW

[1] Serious concerns over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect

F.1.8 Stress reduction programme vs no intervention

Quality assessment	No of patients	Effect	Quality

No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Stress reduction programme	No intervention	Relative (95% CI)	Absolute	
Job stress (number reporting work overload)											
1	observational studies	serious[1]	NA[2]	no serious indirectness[3]	no serious imprecision[4]	none	34/79 (43%)	28/108 (25.9%)	RR 1.66 (1.1 to 2.49)	171 more per 1000 (from 26 more to 386 more)	⊕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	79	108	-	SMD 0.45 lower (0.74 to 0.15 lower)	⊕OOO VERY LOW
absenteeism											
1	observational studies	serious[1]	NA[2]	no serious indirectness[3]	serious[5]	none	31/79 (39.2%)	46/108 (42.6%)	RR 0.92 (0.65 to 1.31)	34 fewer per 1000 (from 149 fewer to 132 more)	⊕OOO VERY LOW

[1] Serious concerns over risk of bias due to self-report measures used
[2] Single study analysis
[3] No concerns over directness as study population, intervention and outcomes match review protocol
[4] No concerns over imprecision as 95% Confidence intervals do not cross the line of no effect
[5] Serious concerns over imprecision as 95% Confidence intervals cross the line of no effect

F.1.9 Psychological support vs control

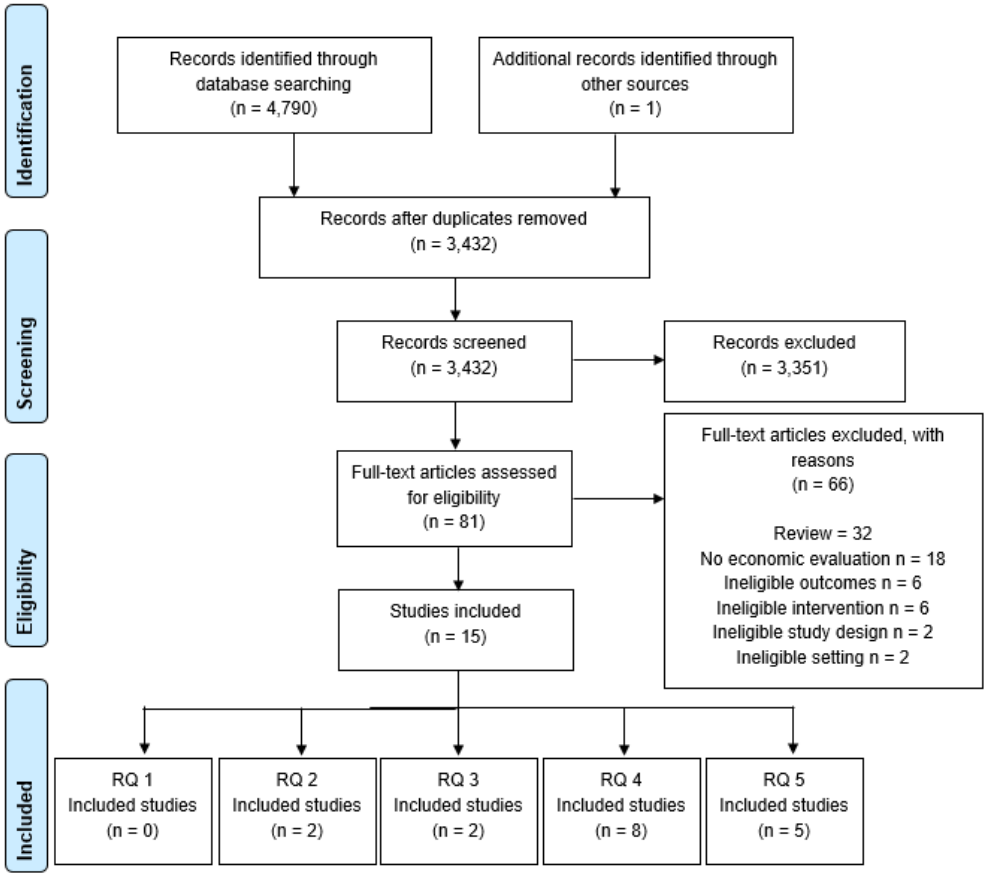
Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Psychological support	Control	Relative (95% CI)	Absolute	
Job stress (Better indicated by lower values)											
1	randomised trials	serious[1]	no serious inconsistency[2]	no serious indirectness[3]	serious[4]	none	27	24	-	SMD 0.08 higher (0.47 lower to 0.63 higher)	⊕⊕OO LOW
Mental health symptoms (Better indicated by lower values)											

1	randomised trials	serious[1]	no serious inconsistency[2]	no serious indirectness[3]	serious[4]	none	27	23	-	SMD 0.12 lower (0.68 lower to 0.43 higher)	⊕⊕OO LOW

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

Appendix G – Economic evidence study selection

Flow chart of economic evidence study selection for mental wellbeing at work guideline



Appendix H - Economic evidence tables

Noben (2014)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Pragmatic cluster randomised controlled trial with cost-utility analysis **Country:** Netherlands **Population:** Nurses in a Dutch hospital **Population size:** 617 Nurses **Intervention:** Two interventions, aiming to promote work functioning to reduce mental health complaints, used after a positive questionnaire result (negative result led to no further action): Occupational Physician (OP) visit [a] and e-	**Perspective:** Employer's perspective **Time horizon:** 6 months **Discounting:** Since study ran for under 12 months, discounting was not necessary **Data sources** All data (costs and outcomes) came directly from the randomised controlled trial	**Mean intervention cost per person; €:** Control group 3.8 OP 76.91 e-Mental Health Not reported **Total costs per person; € [d]:** Control group 1,752 (=£1,756.64 in 2020 GBP) [f] OP 1,266 (=£1,269.35 in 2020 GBP) [f] e-Mental Health 1,375 (=£1,378.64 in 2020 GBP) [f] **Currency & cost year:** EUR (€); 2011	**Work functioning effectiveness [e]:** Control group 0.2 OP 0.24 e-Mental Health 0.16	**Incremental cost effectiveness ratios (ICERs); €:** OP vs control Dominant (less costly and more effective for work functioning) e-Mental Health vs control 4,054 per one-point increase in work functioning *CALCULATED BY YHEC* OP vs. e-Mental Health Dominant (OP was less costly and more effective for work functioning) **Uncertainty:** 75% of the 5,000 bootstrap replications of the ICER were dominant for the OP group, and 76% were in the south-west quadrant for the e-Mental Health group	**Author identified:** None identified **Reviewer identified:** • A six-month time horizon may not fully capture the effects of the interventions.	**Source of funding:** The economic evaluation alongside the Mental Vitality @ Work trial was funded by grant # 208010001 from The Netherlands Organization for Health Research and Development (ZonMw) and co-financed by a grant from the Dutch Foundation GAK Institute. **Further research:** Effect of intervention over a longer time horizon.

Noben (2014)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Mental Health training [b] **Comparator(s):** Control group (no intervention after questionnaire) [c]				(less costly but less effective). The results are similar in both alternative scenarios, which differed the imputation technique.		
Overall applicability: Partly applicable **Overall quality: Minor limitations**						
Abbreviations: ICER: incremental cost-effectiveness ratio; OP: occupational physician; QALY: quality-adjusted life year; ROI: return on investment; WHS: Workers' Health Surveillance;						
a. Occupational physician group nurses were screened for work functioning impairments, and 6 types of mental health complaints using an online survey. This was followed by an invitation for screen positives on either work functioning or mental health complaints to attend the occupational physician, where a seven-step protocol was applied.						
b. e-Mental Health group nurses were also screened for work functioning impairments, and 6 types of mental health complaints using an online survey. This was followed by referral to e-mental health interventions such as Psyfit (€30), Strong at Work (€175), Colour your Life (€195), Don't Panic Online (€225) and Drinking Less (€45).						
c. Nurses were screened for work functioning impairments, and 6 types of mental health complaints using an online survey. No further action was taken.						
d. Total costs were direct medical costs like service use and medication, indirect non-medical costs like absenteeism and presenteeism, and direct non-medical costs						
e. The primary outcome was 'work functioning', as measured on the following subscales of the 'Nurses Work Functioning Questionnaire': Cognitive aspects of task execution, Causing incidents at work, Avoidance behaviour, Conflicts and irritations with colleagues, Impaired contact with patients and their family, Lack of energy and Motivation. The difference between the interventions was examined as the percentage of individuals who improved by at least 40% in the follow-up questionnaire. Hence the score of 0.24 for the OP group meant that 24% of nurses improved their work functioning by at least 40% in the OP intervention. There were no results reported for mental health complaints.						
f. Converted by YHEC using historical exchange rates and PSSRU inflation indices.						

Noben (2015)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Pragmatic cluster randomised controlled trial with cost-benefit analysis **Country:** Netherlands **Population:** Nurses in a Dutch academic medical centre **Population size:** 413 nurses **Intervention:** After positive Workers' Health Surveillance (WHS) instrument result, an Occupational Physician visit [a], after a negative result, no further action. This intervention aimed to reduce mental health complaints. **Comparator(s):** After screening using Workers' Health Surveillance	**Perspective:** Employer's perspective **Time horizon:** 6 months **Discounting:** Since study ran under a year, discounting was not necessary **Data sources** All data (costs and outcomes) came directly from the randomised controlled trial	**Mean intervention cost per person; €:** Control group 25 (=£25.07 in 2020 GBP) [e] OP group 89 (=£89.24 in 2020 GBP) [e] *Incremental* *64* **Currency & cost year:** EUR (€); 2011	**Costs averted per person; €:** Absenteeism Control group 118 OP group 425 *Incremental* *308* Presenteeism Control group -80 OP group 635 *Incremental* *407* **Net benefits per person; €:** Control group -105 (=£-105.28 in 2020 GBP) [e] OP Group 546 (=£547.45 in 2020 GBP) [e] *Incremental* *651*	**Return on investment [c] (ROI); €:** Control group -3 per euro invested OP Group 7 per euro invested *Incremental* 11 per euro invested [d] **Uncertainty:** The incremental intervention cost difference and incremental total cost savings were both statistically significant (p<0.001 and p=0.004 respectively), as was the incremental net benefit (p=0.008). When the productivity gains were lowered by 30%, the incremental ROI was still €8 per €1 invested. When 'hard to quantify' presenteeism benefits were ignored, the ROI was	**Author identified:** • There were high drop-out rates in the trial necessitating imputing messing observations under the expectation-maximization algorithm. • Impacts on staff turnover and spill-over effects of absenteeism were not included. **Reviewer identified:** • A six-month time horizon may not fully capture the effects of the interventions. • There was a lack of probabilistic sensitivity analysis, though confidence	**Source of funding:** Funded by the grant No. 208010001 from the Netherlands Organization for Health Research and Development (ZonMw) and co-financed by a grant from the Dutch Foundation Institute Gak. Netherlands Trial Register NTR2786. **Further research:** • Effect of the intervention over a longer time horizon.

Noben (2015)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
(WHS) instrument result, no further action [b]				still €5 per €1 invested.	intervals were reported.	
Overall applicability: Partly applicable **Overall quality: Minor limitations**						
Abbreviations: ICER: incremental cost-effectiveness ratio; OP: occupational physician; QALY: quality-adjusted life year; ROI: return on investment; WHS: Workers' Health Surveillance;						
a. Nurses were screened for work functioning impairments, and 6 types of mental health complaints using the WHS. This was followed by personalized feedback and screen-positive nurses receiving an invitation to visit an occupational physician (OP). The consultation with the OP followed a 7-step protocol, focussing on identifying impairments in work functioning and providing advice on how to improve wellbeing and work functioning.						
b. Nurses were screened for work functioning impairments, and 6 types of mental health complaints using the WHS. No feedback was given to the nurses and no further action was taken, though the nurses had unrestricted access to usual care.						
c. ROI was calculated as the total cost benefit (from absenteeism and presenteeism) divided by the intervention cost.						
d. For the incremental ROI, the cost of the questionnaire in the control group is considered even though it is not usual care. It must be highlighted that the main result from this study is the ROI of the intervention group, €7 per euro invested (reviewer comment).						
e. 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 and secondary studies

J.1 Excluded studies

Study	Code [Reason]
Ahola, K.; Toppinen-Tanner, S.; Seppanen, J. (2017) Interventions to alleviate burnout symptoms and to support return to work among employees with burnout: Systematic review and meta-analysis. Burnout Research 4: 1-11	- Systematic review and references checked
Aragones, Enric, Caballero, Antonia, Pinol, Josep-Lluis et al. (2014) Persistence in the long term of the effects of a collaborative care programme for depression in primary care. Journal of affective disorders 166: 36-40	- Intervention not delivered with employer involvement
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 does not include a selected population
Boersma, P, Droes, R M, Lissenberg-Witte, B I et al. (2017) Does working with the Veder Contact Method influence the job satisfaction of caregivers? A non-randomized controlled trial in nursing homes for people with dementia. International psychogeriatrics 29(12): 2017-2032	- Study does not include a selected population
Brinkborg, Hillevi, Michanek, Josefin, Hesser, Hugo et al. (2011) Acceptance and commitment therapy for the treatment of stress among social workers: a randomized controlled trial. Behaviour research and therapy 49(67): 389-98	- Study does not include an organisational intervention
Cocchiara, Rosario Andrea, Peruzzo, Margherita, Mannocci, Alice et al. (2019) The Use of Yoga to Manage Stress and Burnout in Healthcare Workers: A Systematic Review. Journal of clinical medicine 8(3)	- Systematic review and references checked
Cooley, Elizabeth and Yovanoff, Paul (1996) Supporting Professionals-at-Risk: Evaluating Interventions to Reduce Burnout and Improve Retention of Special Educators. Exceptional Children 62(4): 336-355	- Study conducted before 2007

Study	Code [Reason]
Deneckere, Svin, Euwema, Martin, Lodewijckx, Cathy et al. (2013) Better interprofessional teamwork, higher level of organized care, and lower risk of burnout in acute health care teams using care pathways: a cluster randomized controlled trial. Medical care 51(1): 99-107	- Study does not include an organisational intervention
Dreison, K.C., Luther, L., Bonfils, K.A. et al. (2018) Job burnout in mental health providers: A meta-analysis of 35 years of intervention research. Journal of Occupational Health Psychology 23(1): 18-30	- Systematic review and references checked
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 and references checked
Ebert, David Daniel, Lehr, Dirk, Smit, Filip et al. (2014) Efficacy and cost-effectiveness of minimal guided and unguided internet-based mobile supported stress-management in employees with occupational stress: a three-armed randomised controlled trial. BMC public health 14: 807	- Study does not include an organisational intervention
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 does not include a selected population
Farzanfar, Ramesh and Finkelstein, Danielle (2012) Evaluation of a workplace technology for mental health assessment: A meaning-making process. Computers in Human Behavior 28(1): 160-165	- Study is qualitative but non-UK
Gartner, F.R., Ketelaar, S.M., Smeets, O. et al. (2011) The Mental Vitality @ Work study: design of a randomized controlled trial on the effect of a workers' health surveillance mental module for nurses and allied health professionals. BMC public health 11: 290	- Study design/protocol only
Geraedts, A.S., Kleiboer, A.M., Wiezer, N.M. et al. (2014) Feasibility of a worker-directed web-based intervention for employees with depressive symptoms. Internet Interventions 1(3): 132-140	- Study does not include an organisational intervention
Geraedts, Anna S, Kleiboer, Annet M, Twisk, Jos et al. (2014) Long-term results of a web-based guided self-help intervention for employees with	- Study does not include an organisational intervention

Study	Code [Reason]
depressive symptoms: randomized controlled trial. Journal of medical Internet research 16(7): e168	
Geraedts, Anna S, Kleiboer, Annet M, Wiezer, Noortje M et al. (2014) Short-term effects of a web-based guided self-help intervention for employees with depressive symptoms: randomized controlled trial. Journal of medical Internet research 16(5): e121	- Study does not include an organisational intervention
Geraedts, Anna S, Kleiboer, Annet M, Wiezer, Noortje M et al. (2013) Web-based guided self-help for employees with depressive symptoms (Happy@Work): design of a randomized controlled trial. BMC psychiatry 13: 61	- Study does not include an organisational intervention
Ghazavi, Zahra; Mardany, Zahra; Pahlavanzadeh, Saeid (2016) Effect of happiness educational program on the level of stress, anxiety and depression of the cancer patients' nurses. Iranian journal of nursing and midwifery research 21(5): 534-540	- Study conducted on a non-OECD or BRICS country
Hamamura, Toshitaka, Suganuma, Shinichiro, Ueda, Mami et al. (2018) Standalone Effects of a Cognitive Behavioral Intervention Using a Mobile Phone App on Psychological Distress and Alcohol Consumption Among Japanese Workers: Pilot Nonrandomized Controlled Trial. JMIR mental health 5(1): e24	- Study does not include an organisational intervention
Hart, Danielle; Paetow, Glenn; Zarzar, Rochelle (2019) Does Implementation of a Corporate Wellness Initiative Improve Burnout?. The western journal of emergency medicine 20(1): 138-144	- Study does not have a control group
Hartung, Doreen and Hahlweg, Kurt (2010) Strengthening parent well-being at the work-family interface: A German trial on workplace Triple P. Journal of Community & Applied Social Psychology 20(5): 404	- Study does not include an organisational intervention
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 does not include an organisational intervention

Study	Code [Reason]
Joyce, S., Shand, F., Lal, T.J. et al. (2019) Resilience@Work Mindfulness Program: Results From a Cluster Randomized Controlled Trial With First Responders. Journal of medical Internet research 21(2): e12894	- Study does not include an organisational intervention
Joyce, Sadhbh, Shand, Fiona, Bryant, Richard A et al. (2018) Mindfulness-Based Resilience Training in the Workplace: Pilot Study of the Internet-Based Resilience@Work (RAW) Mindfulness Program. Journal of medical Internet research 20(9): e10326	- Study does not have a control group
Kapu, April N, Borg Card, Elizabeth, Jackson, Heather et al. (2019) Assessing and addressing practitioner burnout: Results from an advanced practice registered nurse health and well-being study. Journal of the American Association of Nurse Practitioners	- Study is not an intervention study
Ketelaar, Sarah M, Nieuwenhuijsen, Karen, Gartner, Fania R et al. (2014) Mental Vitality @ Work: The effectiveness of a mental module for workers' health surveillance for nurses and allied health professionals, comparing two approaches in a cluster-randomised controlled trial. International archives of occupational and environmental health 87(5): 527-38	- Study does not include a selected population
Landsbergis, Paul, Zoeckler, Jeanette, Rivera, Bianca et al. (2017) Organizational interventions to reduce sources of K-12 teachers' occupational stress. Educator stress: An occupational health perspective.: 369-410	- Systematic review and references checked
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 does not have a control group
Lees, Ty, Elliott, Jaymen L, Gunning, Simon et al. (2019) A systematic review of the current evidence regarding interventions for anxiety, PTSD, sleepiness and fatigue in the law enforcement workplace. Industrial health	- Systematic review and references checked
Livni, D; Crowe, TP; Gonsalvez, CJ (2012) Effects of supervision modality and intensity on alliance and outcomes for the supervisee. Rehabilitation psychology 57(2): 178-186	- Study does not include a selected population

Study	Code [Reason]
Martin, Alicia J Sanders, Matthew R (2003) Balancing Work and Family: A Controlled Evaluation of the Triple P- Positive Parenting Program as a Work-Site Intervention. Child and adolescent mental health 8(4): 161-169	- Study conducted before 2007
Naghieh, Ali, Montgomery, Paul, Bonell, Christopher P et al. (2015) Organisational interventions for improving wellbeing and reducing work-related stress in teachers. The Cochrane database of systematic reviews: cd010306	- Systematic review and references checked
Noben, Cindy, Evers, Silvia, Nieuwenhuijsen, Karen et al. (2015) Protecting and promoting mental health of nurses in the hospital setting: Is it cost-effective from an employer's perspective?. International journal of occupational medicine and environmental health 28(5): 891-900	- Study does not include a selected population
Noone, Stephen J and Hastings, Richard P (2009) Building psychological resilience in support staff caring for people with intellectual disabilities: pilot evaluation of an acceptance-based intervention. Journal of intellectual disabilities : JOID 13(1): 43-53	- Study does not report data for the control group
O Donnchadha, Sean (2018) Stress in caregivers of individuals with intellectual or developmental disabilities: A systematic review of mindfulness-based interventions. Journal of applied research in intellectual disabilities : JARID 31(2): 181-192	- Systematic review and references checked
Onyett, Steve, Rees, Anne, Borrill, Carol et al. (2009) The evaluation of a local whole systems intervention for improved team working and leadership in mental health services. 14	- Study does not have a control group
Osipova, I.S.; Nikishov, S.N.; Rakitskaya, H.V. (2018) Psychological support of teachers with burnout syndrome. Journal of Pharmaceutical Sciences and Research 10(12): 3257-3260	- Study does not have a control group
Ouellette, Rachel R, Frazier, Stacy L, Shernoff, Elisa S et al. (2018) Teacher Job Stress and Satisfaction in Urban Schools: Disentangling Individual-, Classroom-, and Organizational-Level Influences. Behavior therapy 49(4): 494-508	- Study does not include an organisational intervention

Study	Code [Reason]
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 has a clinical diagnosis
Pezaro, Sally; Clyne, Wendy; Fulton, Emily A (2017) A systematic mixed-methods review of interventions, outcomes and experiences for midwives and student midwives in work-related psychological distress. Midwifery 50: 163-173	- Systematic review and references checked
Richmond, Melissa K, Pampel, Fred C, Wood, Randi C et al. (2017) The impact of employee assistance services on workplace outcomes: Results of a prospective, quasi-experimental study. Journal of occupational health psychology 22(2): 170-179	- Study does not include a selected population
Roeser, Robert W, Schonert-Reichl, Kimberly A, Jha, Amishi et al. (2013) Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. Journal of Educational Psychology 105(3): 787-804	- Study does not include an organisational intervention
Sallon, Sarah, Katz-Eisner, Deborah, Yaffe, Hila et al. (2017) Caring for the Caregivers: Results of an Extended, Five-component Stress-reduction Intervention for Hospital Staff. Behavioral medicine (Washington, D.C.) 43(1): 47-60	- Study does not include a selected population
Songprakun, Wallapa and McCann, Terence V (2012) Effectiveness of a self-help manual on the promotion of resilience in individuals with depression in Thailand: A randomised controlled trial. BMC Psychiatry 12	- Study conducted on a non-OECD or BRICS country
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	- Study does not have a control group
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 does not have a control group

Study	Code [Reason]
Tsang, Hector W H, Cheung, W M, Chan, Alan H L et al. (2015) 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 31(1): 35-43	- Study does not include an organisational intervention
Uchiyama, Ayako, Odagiri, Yuko, Ohya, Yumiko et al. (2013) Effect on mental health of a participatory intervention to improve psychosocial work environment: a cluster randomized controlled trial among nurses. Journal of occupational health 55(3): 173-83	- Study does not include a selected population
Viding, C.G., Osika, W., Theorell, T. et al. (2015) "The culture palette"- A randomized intervention study for women with burnout symptoms in Sweden. British Journal of Medical Practitioners 8(2): a813	- Study population has a clinical diagnosis
Wallbank, Sonya (2010) Effectiveness of individual clinical supervision for midwives and doctors in stress reduction: Findings from a pilot study. 8: 65-70	- Study does not report data that can be used
Zimber, A, Gregersen, S, Kuhnert, S et al. (2010) Workplace health promotion through human resources development part I: development and evaluation of qualification programme for prevention of psychic stresses. Gesundheitswesen (bundesverband der arzte des offentlichen gesundheitsdienstes (germany)) 72(4): 209-215	- Full text not in English

J.2 Secondary publications

Study	Code [Reason]
Bolier, L., Ketelaar, S.M., Nieuwenhuijsen, K. et al. (2014) Workplace mental health promotion online to enhance well-being of nurses and allied health professionals: A cluster-randomized controlled trial. Internet Interventions 1(4): 196-204	- Secondary publication
Ketelaar, Sarah M. Gartner, Fania R. Bolier, Linda Smeets, Odile Nieuwenhuijsen, Karen Sluiter, Judith K. (2013) Mental Vitality @ Work-A	- Secondary publication

Study	Code [Reason]
Workers' Health Surveillance Mental Module for Nurses and Allied Health Care Professionals Process Evaluation of a Randomized Controlled Trial. JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE 55(5): 563-571	
Ketelaar, SM, Nieuwenhuijsen, K, G?rtner, FR et al. (2013) Effect of an E-mental health approach to workers' health surveillance versus control group on work functioning of hospital employees: a cluster-RCT. PloS one 8(9): e72546	- Secondary publication
Noben, Cindy, Smit, Filip, Nieuwenhuijsen, Karen et al. (2014) Comparative cost-effectiveness of two interventions to promote work functioning by targeting mental health complaints among nurses: pragmatic cluster randomised trial. International journal of nursing studies 51(10): 1321-31	- Secondary publication
Peterson, Ulla (2008) Stress and Burnout in Healthcare Workers. Karolinska Institutet, Department of Clinical Neuroscience	- Secondary publication

Appendix K Research recommendations – full details

K.1.1 Research recommendation

What tools (for example wellbeing surveys) can be used to identify employees at risk of poor mental wellbeing rather than mental ill health?

K.1.1.1 Why this is important.

The committee noted the lack of evidence around review question 1.1, where the aim was to identify interventions or strategies to help employers and peers to recognise and engage employees who may require support for their mental wellbeing or identify periods of high risk within an organisation. The committee discussed that these interventions would help employers to create a more supportive work environment. Therefore, the committee drafted a research recommendation around what tools can be used to identify employees at risk of poor mental wellbeing.

K.1.1.2 Rationale for research recommendation

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 a lack of evidence around interventions or strategies to help employers and peers to recognise and engage employees who may require support for their mental wellbeing.
Relevance to NICE guidance	Universal organisational approaches have been considered in this guideline and there is a lack of evidence about what tools can be used to identify employees at risk of poor mental wellbeing.
Relevance to the NHS	The outcome would increase understanding of which strategies can be used to identify employees at risk of poor mental wellbeing in organisations including the NHS.
National priorities	High – outlined in the NHS long term plan
Current evidence base	Minimal evidence on what tools can be used to identify employees at risk of poor mental wellbeing rather than mental ill health
Equality considerations	None known

K.1.1.3 Modified PICO table

Population	• Everyone aged 16 years or older in full or part time employment. • Employers from micro, small, medium and/or large organisation across private and public sector
Intervention	Tools (for example wellbeing surveys) to identify employees at risk of poor mental wellbeing rather than mental ill health?
Comparator	Usual care or no intervention
Outcome	• Identification of tools

	• Use of tools • Identification of employees at risk of poor mental wellbeing
Study design	• Quantitative • Mixed methods
Timeframe	Short, medium and long term
Additional information	None