

Occupational health interventions' impact on absenteeism and economic returns: A systematic review and meta-analysis¹

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1. Supplementary material
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Illustration 1. Search strategy

PubMed Search:

1. Keyword combinations for **work-related setting**
(Work*[ti] OR employ*[ti] OR occupational[ti] OR job[ti] OR labor[ti] OR OHS[ti] OR company*[ti])
AND (health[ti] OR well-being[ti] OR wellness[ti] OR prevent*[ti] OR assistan*[ti])
AND (intervention*[ti] OR program*[ti] OR strateg*[ti] OR initiative*[ti])
2. Keyword combinations for **mental health**
Mental[tiab] OR psych*[tiab] OR stress[tiab] OR depress*[tiab] OR therapy*[tiab] OR cognit*[tiab]
OR cognitive behavioral therapy[tiab] OR CBT[tiab] OR mindful*[tiab] OR burnout[tiab] OR
anxiety[tiab] OR emotion*[tiab]
3. Keyword combinations for **physical activity**
Activ*[tiab] OR exercise[tiab] OR training[tiab] OR activ*[tiab] OR movement[tiab] OR
fitness[tiab] OR sport*[tiab] OR sedentar*[tiab] OR physical[tiab]
4. Keyword combinations for **nutrition and weight management**
(Nutrition*[tiab] OR diet*[tiab] OR eating*[tiab] OR food[tiab] OR nutrient*[tiab] OR
vitamin*[tiab])
OR (weight management[tiab] OR weight control[tiab] OR weight loss[tiab] OR weight
reduction[tiab] OR body weight[tiab] OR BMI[tiab] OR body mass index[tiab] OR obesity[tiab]
OR overweight[tiab])
5. Keyword combinations for **working climate**
Climate[tiab] OR environment[tiab] OR social[tiab] OR culture[tiab] OR atmosphere[tiab] OR
psychosocial[tiab] OR relation*[tiab] OR satisfact*[tiab]
6. Keyword combinations for economics
Econom*[tiab] OR cost-effectiv*[tiab] OR cost-benefit[tiab] OR ROI[tiab] OR return on
investment[tiab] OR economic impact[tiab]
7. Keyword combinations for sickness absence
Claims[tiab] OR sick days[tiab] OR sickness days[tiab] OR sickness absence*[tiab] OR sick
leave[tiab]

Web of Science Search:

1. Keyword combinations for **work-related setting**
Work* OR employ* OR occupational OR job OR labor OR OHS OR company*)
AND (health OR well-being OR wellness OR prevent* OR assistan*)
AND (intervention* OR program* OR strateg* OR initiative*)
2. Keyword combinations for **mental health**
Mental OR psych* OR stress OR depress* OR therapy* OR cognit* OR "cognitive behavioral
therapy" OR CBT OR mindful* OR burnout OR anxiety OR emotion*
3. Keyword combinations for **physical activity**
Activ* OR exercise OR training OR movement OR fitness OR sport* OR sedentar* OR physical
4. Keyword combinations for nutrition and weight management
(nutrition* OR diet* OR eating* OR food OR nutrient* OR vitamin*)
OR (weight management OR weight control OR weight loss OR weight reduction OR body
weight OR BMI OR "body mass index" OR obesity OR overweight)
5. Keyword combinations for **working climate**
Climate OR environment OR social OR culture OR atmosphere OR psychosocial OR relation* OR
satisfact*
6. Keyword combinations for economics
Econom* OR cost-effectiv* OR cost-benefit OR ROI OR "return on investment" OR "economic
impact"
7. Keyword combinations for sickness absence
Claims OR "sick days" OR "sickness days" OR "sickness absence*" OR "sick leave"

Illustration 2. Derivation of time-scaling for confidence intervals

To compare absenteeism rates over different study durations, effects are scaled for a common period of 12 months (T). For sick days, we increased the expected mean linearly with time. Meanwhile its variance grows proportionally to the observation length.

Let t be the study's original follow-up and T the target period of 12-month. Let μ the mean difference in sick days between intervention and control group and SE its standard error.

1. Mean scaling (linear time):

$$\mu_T = \mu_t \times \frac{T}{t}$$

2. Variance scaling (proportionally to time if outcomes are independent):

$$VAR_T = VAR_t \times \frac{T}{t}$$

3. Calculating the SE (based on the square root of VAR):

$$SE_T = SE_t \times \sqrt{\frac{T}{t}}$$

4. Calculating the 12-month CI (based on the SE and μ):

$$CI_T = \mu_T \pm Z \times SE_t \times \sqrt{\frac{T}{t}}$$

Table S1. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Study type	Completed, primary quantitative articles including but not limited to experimental, quasi-experimental, observational and modelling studies published in peer-reviewed journals	Uncompleted or qualitative heavy articles including but not limited to protocols, systematic reviews, meta-studies, opinion pieces or any study not published in peer-reviewed journals
Intervention type	Intervention focuses on improvement of mental health, physical health & fitness, nutrition, as well as working atmosphere	Focus on interventions that do not address the topics of mental health, physical health & fitness, nutrition, as well as working atmosphere
Intervention setting	Employer/work-related intervention	Non-employer/work-related intervention
Country scope	Developed countries classified by OECD (2024)	Other Countries
Outcome measures	Economic return and sick days clearly quantified with numeric outcomes respective statistics (e.g., CI, SE, etc.)	No quantification of outcomes variables with significant lack in statistical descriptives
Participants	>18 years of age	<18 years of age
Language	English or German	Not English or German
Time	2004 onwards	2004 and before

Table S2. Risk of bias assessment

The risk of bias of the papers included was assessed using the Joanna Briggs Institute's (JBI) critical appraisal tools. The JBI tools provide a comprehensive and standardized approach to assessing the methodological quality of diverse study designs, ensuring reliability and consistency in the evaluation process.

The length of each checklist varied depending on the assessment type, with response options including "Yes," "No," "Unclear," and "N/A." A numerical score was calculated based on the proportion of "Yes" responses, expressed as a percentage of all questions answered. During the evaluation, it was identified that two specific questions from the RCT appraisal checklist (i.e., "Were those delivering the treatment blind to treatment assignment?" and "Were treatment groups treated identically other than the intervention of interest?") did not provide meaningful differentiation across reviews. This was attributed to the unrealistic expectation of strictly double-blinded and controlled designs in workplace settings (Barthelme et al., 2019). Consequently, Questions 5 and 6, often unfulfilled, were removed from the RCT checklist. For similar considerations, Question 4 from the critical appraisal tool for quasi-experimental studies was excluded.

The exact criteria and the systematic method of evaluation employed to ensure fair and consistent assessment are described in the following.

JBI critical appraisal tool for assessment of risk of bias for randomized controlled trials (2023)

JBI Question	Systematic evaluation method
1. Was true randomization used for assignment of participants to treatment groups?	Always "Yes", as otherwise, it is not an RCT.
2. Was allocation to treatment groups concealed?	"Yes" if the randomization was performed by an independent researcher, or a computer algorithm was used, or a coin was flipped.
3. Were treatment groups similar at the baseline?	"Yes" if there were only minimal differences or if these were controlled for in the analysis.
4. Were participants blind to treatment assignment?	"Yes" or "No" if explicitly stated, otherwise "Unclear".
5. Were those delivering the treatment blind to treatment assignment?	Excluded due to feasibility considerations for this type of interventions.
6. Were treatment groups treated identically other than the intervention of interest?	Excluded due to feasibility considerations for this type of interventions.
7. Were outcome assessors blind to treatment assignment?	"Yes" or "No" if explicitly stated, otherwise "Unclear".
8. Were outcomes measured in the same way for treatment groups?	Always "Yes", as no study indicated any evidence of different measurements.
9. Were outcomes measured in a reliable way?	"Yes" if Cronbach's alpha was specified or standardized, validated and commonly used questionnaires or non-self-reported data from insurers or employees were used for at least one outcome variable. "No" if only undefined questionnaires or questionnaires modified without details were used.
10. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?	"Yes" if follow-up was complete. If not complete: "No" if the authors do not describe differences in characteristics between completers and non-completers. "No" if differences were found but not analyzed.

JBI Question	Systematic evaluation method
	Otherwise “Yes” or “Unclear” if no information was provided.
11. Were participants analysed in the groups to which they were randomized?	“Yes” or “No” if explicitly stated, otherwise “Unclear”.
12. Was appropriate statistical analysis used?	“No” if no power analyses were performed, or any confounders were included in the analysis, or the methods were not appropriate, or important data were not reported. Otherwise “Yes”.
13. Was the trial design appropriate and any deviations from the standard RCT design accounted for in the conduct and analysis of the trial?	“Yes” for all studies except one, which is “Unclear” because it discusses the design itself and indicates it as a potential limitation.

JBI critical appraisal tool for assessment of risk of bias for economic evaluations (2020)

JBI Question	Systematic evaluation method
1. Is there a well-defined question?	Always “Yes”.
2. Is there a comprehensive description of alternatives?	“Yes” or “No”.
3. Are all important and relevant costs and outcomes for each alternative identified?	Always “Yes” if reasonably comprehensive costs and outcomes were identified, with one exception that excluded any intervention costs.
4. Has clinical effectiveness been established?	“Yes” if the study was combined with an RCT or quasi-experiment with significant results or if relevant literature was reported. Otherwise “No”.
5. Are costs and outcomes measured accurately?	“Yes” for insurer or company data. “No” if a large proportion is based on estimates or self-reported data, or data may have been collected inconsistently.
6. Are costs and outcomes valued credibly?	“Yes” if both costs and outcomes were valued. “No” if insufficient justifications were given and insufficient differentiation was made.
7. Are costs and outcomes adjusted for differential timing?	“Yes” for all studies that have not exceeded a time period of one year, because the discount rate in these cases is automatically 0. Otherwise “Yes” if explicitly specified, else “No”.
8. Is there an incremental analysis of costs and consequences?	“Yes” or “No”.
9. Were sensitivity analyses conducted to investigate uncertainty in estimates of cost or consequences?	“Yes” or “No”.
10. Do study results include all issues of concern to users?	“Yes” as long as a comprehensive analysis and discussion has taken place and various aspects have been highlighted. “No” for very unidimensional analyses or the lack of important information for evaluating the results (i.e. details on statistical methods).

JBI Question	Systematic evaluation method
11. Are the results generalizable to the setting of interest in the review?	"No" for studies on a single company or if generalizability was explicitly discussed. Otherwise "Yes".

JBI critical appraisal tool for assessment of risk of bias for quasi-experimental studies (2024)

JBI Question	Systematic evaluation method
1. Is it clear in the study what is the "cause" and what is the "effect" (ie, there is no confusion about which variable comes first)?	Always "Yes".
2. Was there a control group?	"Yes" or "No".
3. Were participants included in any comparisons similar?	"N/A" for missing control group. "Unclear" if details are absent. "No" if there were significant differences, otherwise "Yes".
4. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	Excluded due to feasibility considerations for this type of interventions.
5. Were there multiple measurements of the outcome, both pre and post the intervention/exposure?	Always "Yes".
6. Were the outcomes of participants included in any comparisons measured in the same way?	"N/A" for missing control group. "Unclear" if details are absent. "No" if there were differences in measurement, otherwise "Yes".
7. Were outcomes measured in a reliable way?	"Yes" if Cronbach's alpha was specified or standardized, validated and commonly used questionnaires or non-self-reported data from insurers or employees were used for at least one outcome variable. "No" if details were absent or only undefined questionnaires or questionnaires modified without details were used.
8. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?	"N/A" for missing control group. "Yes" if follow-up was complete. If not complete: "No" if the authors do not describe differences in characteristics between completers and non-completers. "No" if differences were found but not analyzed. Otherwise "Yes" or "Unclear" if no information was provided.
9. Was appropriate statistical analysis used?	"No" if no power analyses were performed, or any confounders were included in the analysis, or the methods were not appropriate, or important data were not reported. Otherwise "Yes".

JBI critical appraisal tool for assessment of risk of bias for cohort studies (2020)

JBI Question	Systematic evaluation method
1. Were the two groups similar and recruited from the same population?	"Yes" or "Unclear".
2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?	"Yes" or "Unclear".
3. Was the exposure measured in a valid and reliable way?	"Yes" if standardized, validated and commonly used questionnaires or non-self-reported data from insurers or employees were used for at least one outcome variable. "No" if only undefined questionnaires or questionnaires modified without details were used.
4. Were confounding factors identified?	Always "Yes".
5. Were strategies to deal with confounding factors stated?	Always "Yes".
6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	"Yes" or "Unclear".
7. Was the exposure measured in a valid and reliable way?	"Yes" if standardized, validated and commonly used questionnaires or non-self-reported data from insurers or employees were used for at least one outcome variable. "No" if only undefined questionnaires or questionnaires modified without details were used.
8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Always "Yes".
9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Always "No" as no reasons were given.
10. Were strategies to address incomplete follow up utilized?	"Yes" or "No".
11. Was appropriate statistical analysis used?	"No" if no power analyses were performed, or any confounders were included in the analysis, or the methods were not appropriate, or important data were not reported. Otherwise "Yes".

Table S3. List of all reviews with inclusion/exclusion decision

Ref	Authors	Year	Inclusion/exclusion	Reason for exclusion
(26)	Akerstrom et al.	2021	Inclusion	N/A
-	Aldana et al.	1993	Exclusion	>20 years old
(27)	Arends et al.	2013	Inclusion	N/A
-	Avey et al.	2022	Exclusion	Outcomes not applicable
(28)	Baker et al.	2008	Inclusion	N/A
-	Bergstroem et al.	2007	Exclusion	Intervention not identifiable
(29)	Blake et al.	2013	Inclusion	N/A
(30)	Blangsted et al.	2008	Inclusion	N/A
(31)	Bondar et al.	2022	Inclusion	N/A
(32)	Braun et al.	2014	Inclusion	N/A
(33)	Brox and Frøystein	2005	Inclusion	N/A
-	Burton et al.	2014	Exclusion	Intervention not identifiable
-	Chung et al.	2009	Exclusion	Outcomes not applicable
(34)	De Boer et al.	2004	Inclusion	N/A
-	Declercq et al.	2022	Exclusion	Protocol
(35)	Dement et al.	2015	Inclusion	N/A
(36)	Duijts et al.	2008	Inclusion	N/A
(37)	Ebert et al.	2018	Inclusion	N/A
(38)	Elson et al.	2019	Inclusion	N/A
-	Erfurt et al.	1992	Exclusion	>20 years old
-	Erfurt et al.	1992	Exclusion	Duplication
-	Eriksen et al.	2002	Exclusion	>20 years old
(39)	Framke et al.	2016	Inclusion	N/A
(40)	Freund et al.	2024	Inclusion	N/A
-	Fries et al.	1993	Exclusion	>20 years old
-	Frost et al.	2007	Exclusion	No access
(41)	Geraedts et al.	2015	Inclusion	N/A
(42)	Goetzel et al.	2014	Inclusion	N/A
(43)	Gregson et al.	2023	Inclusion	N/A
(44)	Groeneveld et al.	2011	Inclusion	N/A
(45)	Gubler et al.	2017	Inclusion	N/A
-	Helma et al.	2007	Exclusion	Intervention not in focus
(46)	Hendriksen et al.	2016	Inclusion	N/A
(47)	Hengel et al.	2013	Inclusion	Outcomes not applicable
(48)	Hengel et al.	2014	Inclusion	N/A
(49)	Herman et al.	2008	Inclusion	N/A
-	Hoopmann et al.	2001	Exclusion	>20 years old
(50)	Hughes et al.	2007	Inclusion	N/A
-	Hulten et al.	2021	Exclusion	Intervention not in focus
-	Hultqvist et al.	2021	Exclusion	Intervention not identifiable
(51)	Iijima et al.	2013	Inclusion	N/A
(52)	Ikegami et al.	2010	Inclusion	N/A
(53)	Jenny et al.	2011	Inclusion	N/A
-	Johnsen et al.	2018	Exclusion	Intervention as comparator
(54)	Jorgensen et al.	2011	Inclusion	N/A
(55)	Kapinos et al.	2015	Inclusion	N/A
(56)	Karlsson et al.	2024	Inclusion	N/A

Ref	Authors	Year	Inclusion/exclusion	Reason for exclusion
(57)	Keus van de Poll et al.	2020	Inclusion	N/A
(58)	Keus van de Poll et al.	2020	Inclusion	N/A
-	Kinchin et al.	2017	Exclusion	Not employer perspective
-	Klarreich et al.	1987	Exclusion	>20 years old
(59)	Klasen et al. (RCT 2)	2021	Inclusion	N/A
(60)	Kobayashi et al.	2008	Inclusion	N/A
(61)	Krampen	2010	Inclusion	N/A
-	Kuorinka et al.	1994	Exclusion	>20 years old
-	Lahiri et al.	2005	Exclusion	Intervention not in focus
(62)	Larsen et al.	2019	Inclusion	N/A
(63)	Lerner et al.	2020	Inclusion	N/A
(64)	Linden et al.	2014	Inclusion	N/A
-	Loeppke et al.	2008	Exclusion	>20 years old
(65)	Losina et al.	2017	Inclusion	N/A
(66)	Makrides et al.	2011	Inclusion	N/A
-	Maniscalco et al.	1999	Exclusion	>20 years old
(67)	Meenan et al.	2010	Inclusion	N/A
(68)	Milani et al.	2009	Inclusion	N/A
-	Mohandas et al.	2022	Exclusion	No access
(69)	Musich et al.	2015	Inclusion	N/A
-	Nadolski et al.	1987	Exclusion	>20 years old
-	Noben et al.	2014	Exclusion	Duplication
(70)	Noben et al.	2014	Inclusion	N/A
(71)	Norwitz et al.	2022	Inclusion	N/A
(72)	Ornek et al.	2020	Inclusion	N/A
-	Pegus et al.	2002	Exclusion	>20 years old
(73)	Proper et al.	2004	Inclusion	N/A
-	Rantonen et al.	2011	Exclusion	Duplication
(74)	Rantonen et al.	2018	Inclusion	N/A
(75)	Renaud et al.	2008	Inclusion	N/A
(76)	Robroek et al.	2012	Inclusion	N/A
-	Rollison et al.	2022	Exclusion	Intervention not identifiable
(77)	Ryan et al.	2018	Inclusion	N/A
(78)	Saleh et al.	2010	Inclusion	N/A
-	Shaw et al.	2014	Exclusion	Protocol
-	Shimizu et al.	2003	Exclusion	>20 years old
-	Song et al.	2019	Exclusion	Duplication
(79)	Song et al.	2021	Inclusion	Follow-up study
(80)	Stansfeld et al.	2015	Inclusion	N/A
-	Stein et al.	2000	Exclusion	>20 years old
-	Syrjälä et al.	2022	Exclusion	Protocol
(81)	Taimela et al.	2009	Inclusion	N/A
-	Taimela et al.	2008	Exclusion	Duplication
(82)	Taimela et al.	2007	Inclusion	N/A
(83)	Thiart et al.	2016	Inclusion	N/A
(84)	Tveito and Eriksen	2008	Inclusion	N/A
(85)	Van den Ven et al.	2023	Inclusion	N/A
(86)	Van Dongen et al.	2013	Inclusion	N/A
(87)	Van Dongen et al.	2017	Inclusion	N/A

Ref	Authors	Year	Inclusion/exclusion	Reason for exclusion
(88)	Van Holland et al.	2017	Inclusion	N/A
(89)	Viester et al.	2014	Inclusion	N/A
(90)	Von Thiele Schwarz et al.	2012	Inclusion	N/A
-	Von Thiele Schwarz et al.	2011	Exclusion	Duplication
(91)	Vonderlin et al.	2023	Inclusion	N/A
-	Wickizer et al.	2011	Exclusion	Intervention not in focus
(92)	Wijnen et al.	2019	Inclusion	N/A
-	Yoshimura et al.	2013	Exclusion	Not in English or German
(93)	Zetterberg et al.	2022	Inclusion	N/A

Table S4. Vignettes for studies included in the systematic review

(26) Akerstrom et al. (2021)			
Title	Can Working Conditions and Employees’ Mental Health Be Improved via Job Stress Interventions Designed and Implemented by Line Managers and Human Resources on an Operational Level?		
Country scope	Sweden		
Industry scope	Mainly health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Public sector employees, with approximately 85% working in the healthcare sector.		
	Sample size: N/A	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Working atmosphere		
	Type: Work climate change		
	A workplace-wide stress intervention was designed and implemented by line managers in collaboration with HR partners at the operational level. It focused on modifying work processes and how tasks were performed.		
	Duration: ~24 months		
	Setting: Phone-based, in-person		
Comparator	Reference data from 247 workplace groups across 18 operational areas and 10 departments, matching the organizational level of the intervention groups. Employee turnover and sick leave data were only available in aggregated form.		

Outcome	Outcome measure(s): Sickness absence rate Registry data on sickness absence rate as well as data on working conditions, motivation, health, employee turnover
Results	The intervention had no significant effect on overall sickness rates but led to a statistically significant reduction in short-term illnesses (≤ 14 days) by 0.2 percentage points in the intervention group.

(27) Arends et al. (2013)

Title	Economic Evaluation of a Problem Solving Intervention to Prevent Recurrent Sickness Absence in Workers with Common Mental Disorders		
Country scope	Netherlands		
Industry scope	Not specified		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees aged 18 to 63 years with a common mental disorder (CMD) diagnosis at the start of sickness absence and the capacity for partial or full return to work.		
	Sample size: 158	Mean age: 42.3	Female ratio: 59%
Intervention(s)	Domain: Working atmosphere		
	Type: Education and training opportunities		
	The intervention group received the SHARP-at-work program, delivered by occupational physicians (OPs) when employees with a CMD diagnosis were ready to return to work. The program followed five steps: problem identification, solution brainstorming, documentation, action planning, and evaluation. OPs underwent a two-day training and were advised to conduct 2 to 5 consultations, each lasting approximately 30 minutes.		
	Duration: Not specified		
	Setting: In-person		
Comparator	The control group followed the Netherlands Society of Occupational Medicine guidelines for managing workers with mental health issues. Occupational physicians conducted a single consultation after returning to work to prevent relapse.		
Outcome	Outcome measure(s): Incidence/time to recurrent sickness absence		
	Primary: Incidence of recurrent sickness absence Secondary: Time to recurrent sickness absence, cost-effectiveness ratio (CER), and cost-benefit analysis (CBA)		
Results	Time to recurrent sickness absence was significantly shorter in the intervention group (253 vs. 365 days in CAU), with a mean effect difference of 55 days. However, no economic benefit was observed, as the intervention incurred €800 higher costs on average, making it more effective in reducing sickness absence but also more expensive.		

(28) Baker et al. (2008)

Title	Using a Return-On-Investment Estimation Model to Evaluate Outcomes from an Obesity Management Worksite Health Promotion Program		
Country scope	United States		
Industry scope	N/A		
Study type	Quasi-Experimental		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees with a BMI of 30 or higher, or employees with a BMI of 25 or higher and a comorbid condition such as type 2 diabetes, high blood pressure, other cardiovascular diseases or other weight-related conditions.		
	Sample size: 890	Mean age: 44.2	Female ratio: 74.3%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs		
	The Healthyroads program supports weight loss and health improvement through up to 48 telephone counseling sessions with a personal health coach, access to written materials and a health website, exercise planning, nutrition education, and a web-based health tracker.		
	Duration: 12 months		
	Setting: Phone-based, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): ROI		
	Self-reporting-based financial outcomes (including ROI) and prevalence of modifiable risk factors (e.g., insufficient physical activity)		
Results	After one year, the program resulted in an estimated savings of \$1.17 for every dollar invested. The total savings for employers amounted to USD 311,755, with 59% (\$184,582) coming from reduced healthcare expenditures and 41% (\$127,173) from productivity improvements.		

(29) Blake et al. (2013)

Title	Five-year workplace wellness intervention in the NHS		
Country scope	United Kingdom		
Industry scope	Health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	National Health Service (NHS) staff in a large acute hospital.		
	Sample size: 1,452	Mean age: 41.06	Female ratio: 79.6%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs		
	The five-year NHS workplace wellness program aimed to improve staff health and wellbeing, supported by dedicated funding and a health commissioner. It included health campaigns, fitness facilities, physical and dietary activities, relaxation techniques, health education, community engagement, cycling initiatives, workplace health advocates, and an online platform with activity schedules.		
	Duration: 6 months		
	Setting: In-person, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): Sickness absence rate		
	Self-reported data on sick days, health and behavioral outcomes, psychosocial factors, work-related outcomes		
Results	After the intervention, long-term sickness absence was lower in the intervention group at 6 months but slightly higher at 12 months. However, the differences were not statistically significant. After 12 months, the intervention group had an average of 8.5 sick days (SD: 20.6) compared to 7.5 days in the control group (SD: 16.9). Although the baseline sick days were lower in the control group, the intervention group showed a higher reduction in sick days.		

(39) Blangsted et al. (2008)

Title	One-year randomized controlled trial with different physical-activity programs to reduce musculoskeletal symptoms in the neck and shoulders among office workers		
Country scope	Denmark		
Industry scope	Not assignable		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Office workers from a Danish national authority in the east of Denmark. Participants all worked in an office environment.		
	Sample size: 616	Mean age: 44.99	Female ratio: 64.5%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs		
	Two interventions were implemented: (1) Specific Resistance Training with three 20-minute weekly sessions to strengthen shoulder and neck muscles. (2) All-round Physical Exercise aimed at increasing overall activity, with motivational sessions, personalized contracts, and 1-4 trainer visits per month.		
	Duration: 12 months		
	Setting: In-person		
Comparator	No additional physical activity; focused on improving workplace health (e.g., ergonomics, stress, indoor air) through group-led initiatives		
Outcome	Outcome measure(s): Sick days, Sickness absence rate		
	Total number of sick days in the last year: 3 months accumulated number of all sick days multiplied by 4 to obtain an annual value Sickness absence rate: Changes in the sickness absence values of the WAI (work ability index)		
Results	No statistically significant changes in sickness absence due to the interventions. At the beginning of the study, the average sickness absence of the participants in the last 3 months was 1.5 days, and the average sickness absence in the previous year was 5.3 days.		

(31) Bondar et al. (2022)

Title	Clinical and Financial Outcomes Associated With a Workplace Mental Health Program Before and During the COVID-19 Pandemic		
Country scope	United States		
Industry scope	Not assignable		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees with at least moderate anxiety or depression, determined by baseline scores on the PHQ-9 (≥10) or GAD-7 (≥10), who participated in a workplace mental health program.		
	Sample size: 1,132	Mean age: 32.9	Female ratio: 71.8%
Intervention(s)	Domain: Mental health and stress		
	Type: Mental health initiatives/training		
	The digital mental health program offered included screening for common mental disorders, access to digital self-help content, guidance in finding appropriate care, as well as options for video and in-person psychotherapy or medication management.		
	Duration: 6 months		
	Setting: In-person, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): ROI		
	Primary: Self-reporting-based ROI, symptoms of depression and anxiety Secondary: Increase in working hours and employee retention		
Results	The study showed a favorable ROI across all wage groups. Employees with depression or anxiety saved \$3,440 in salary costs over six months. Treatment cost \$740 on average. Participants took 0.32 fewer sick days per week and reported 0.64 fewer unproductive days, indicating increased productivity.		

(32) Braun et al. (2014)

Title	Better health at work? An evaluation of the effects and cost–benefits of a structured workplace health improvement program in reducing sickness absence		
Country scope	United Kingdom		
Industry scope	Not assignable		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees in Northeast England took part in the Better Health at Work Award (BHWA) program, involving 232 organizations and 21.4% of the regional workforce. Private sector participation was 49%.		
	Sample size: N/A	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Working atmosphere, mental health & stress, physical health & fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs, mindfulness and relaxation, work climate change, mental health policies		
	The "Better Health at Work Award" program has three levels—Bronze, Silver, and Gold—focusing on workplace improvements and health promotion, including physical activity, nutrition, health monitoring, and mental well-being.		
	Duration: N/A		
	Setting: N/A		
Comparator	N/A		
Outcome	Outcome measure(s): Sick days, cost-benefit (CBA)		
	Sick days were measured as the reduction in sickness-related absences per employee per year		
Results	Participation in the BHWA program reduced absenteeism by 0.26 to 1.6 days per employee per year, depending on the level achieved. Program costs ranged from £359 (Bronze) to £3,606 (Gold), with the cost per absence day saved estimated at £0.90 (Bronze) to £125 (Gold).		

(33) Brox and Frøystein (2005)

Title	Health-related quality of life and sickness absence in community nursing home employees: randomized controlled trial of physical exercise		
Country scope	Norway		
Industry scope	Health care		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Care home staff in a community-based facility for older people.		
	Sample size: 129	Mean age: 42.5	Female ratio: 96.5%
Intervention(s)	Domain: Mental health & stress, physical health & fitness		
	Type: Exercise programs, nutrition and weight management, mindfulness & relaxation		
	Weekly one-hour light group exercise based on an aerobic fitness model designed to improve cardiovascular fitness, muscular strength and flexibility. In addition, the intervention group was offered courses on exercise, nutrition and stress management.		
	Duration: 6 months		
	Setting: In-person		
Comparator	Control group was not offered any intervention		
Outcome	Outcome measure(s): Sick days		
	Sick days recorded over two 7-month periods, starting on 1 April of the year before and the year of the intervention		
Results	Sickness absence rose in both groups (from 6.8 to 15.6 in the intervention and from 10.4 to 14.5 in the control group), with a statistically significant increase in the intervention group, resulting in a 4.7-day difference (95% CI: -5.7 to 15.0) favoring the control group. No changes were observed in self-certified sick days, but both groups experienced increases in the number of long-term sick leave cases and the duration of these absences.		

(34) De Boer et al. (2004)

Title	An Occupational Health Intervention Programme for Workers at Risk for Early Retirement; A Randomised Controlled Trial		
Country scope	Netherlands		
Industry scope	Technology		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees over the age of 50 reporting they would not be able to work until the normal retirement age.		
	Sample size: 116	Mean age: 53.4	Female ratio: 7%
Intervention(s)	Domain: Physical health and fitness		
	Type: Health monitoring programs		
	The occupational health program, conducted by the respective company doctors of the participating employees, included at least three counseling sessions, the creation of a detailed action plan, consultations with superiors and HR managers, and, if necessary, referrals to GPs, specialists, or psychologists.		
	Duration: 6 months		
	Setting: In-person		
Comparator	Care as usual, meaning participants were not invited to a counseling interview but could visit the company doctor at any time.		
Outcome	Outcome measure(s): Sick days		
	Primary: Early retirement Secondary: Registry data on sick days (6, 12 and 24 months), ability to work, stress-related symptoms, quality of life, and satisfaction with the intervention		
Results	Differences in sick leave days were not statistically significant, with the intervention group averaging 15.4 days compared to 21.4 days in the control group during the first six months (p = 0.23). Over two years post-randomization, the intervention group averaged 82.3 sick leave days, while the control group averaged 107.8 days.		

(35) Dement et al. (2015)

Title	Impacts of Workplace Health Promotion and Wellness Programs on Health Care Utilization and Costs Results From an Academic Workplace		
Country scope	United States		
Industry scope	Health care		
Study type	Cohort study		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees from a large university hospital system, including an academic medical center and two regional hospitals, with roles in research, teaching, administration, and patient care.		
	Sample size: 10,432	Mean age: 41.55	Female ratio: 58%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs		
	The comprehensive workplace health promotion program, offered free to eligible employees for over 20 years, aimed to improve health indicators like smoking, blood pressure, cholesterol, weight, physical activity, and stress. Key elements included health risk assessments, voluntary screenings, health coaching, weight management classes, fitness counseling, running/walking clubs, activity campaigns, and access to farmers' markets and fitness clubs, all managed by an external provider.		
	Duration: N/A		
Comparator	Setting: In-person, digital (web/app-based)		
	Employees who did not complete a health risk assessment (HRA) during the study period from 2006 to 2011 and did not participate in the disease management program in the two years before or during the study period.		
Outcome	Outcome measure(s): ROI		
	Self-reported and registry data on ROI (savings divided by cost of the HP program [including intervention, personnell and administrative costs]), service utilization		
Results	The study estimated a return on investment (ROI) of 2.53 for every dollar invested in the health promotion (HP) program, based on an average monthly saving of \$35 in healthcare costs per participant.		

(36) Duijts et al. (2008)

Title	Effectiveness of a Preventive Coaching Intervention for Employees at Risk for Sickness Absence Due to Psychosocial Health Complaints: Results of a Randomized Controlled Trial		
Country scope	Netherlands		
Industry scope	Health care, consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees at high risk of sickness absence due to psychosocial health issues, excluding those on sick leave.		
	Sample size: 151	Mean age: 42.8	Female ratio: 82%
Intervention(s)	Domain: Working atmosphere		
	Type: Education & training opportunities		
	The intervention group received a preventive coaching program with 7 to 9 one-hour sessions, led by eight coaches from the ‘Capability’ organization. The program included goal-setting, a planning session with the supervisor, individual coaching on behavioral change, and a final evaluation.		
	Duration: 4.5 months		
	Setting: In-person		
Comparator	The control group received the usual care in their companies, such as counselling from social workers or company doctors, if required.		
Outcome	Outcome measure(s): Sick days		
	Primary: Self-reported and registry data on sick days due to mental health status (never, 1, 2, 3, 4, 5, 5+; 12 months) Secondary: General health, mental stress, anxiety, coping strategies, mental work characteristics, recovery needs, fatigue, burnout, and various socio-demographic and organizational characteristics		
Results	Employees in the coaching group had 2.5 fewer sick days (14% reduction) in the year after baseline compared to usual care, with a mean difference of −2.53 days in favor of the intervention group. Secondary outcomes showed improvements in self-reported health, psychological distress, burnout, and anxious mood in the intervention group.		

(37) Ebert et al. (2018)

Title	A health economic outcome evaluation of an internet-based mobile-supported stress management intervention for employees		
Country scope	Germany		
Industry scope	N/A		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees experiencing increased stress symptoms, with participants scoring ≥22 on the Perceived Stress Scale (PSS-10). Recruitment was primarily conducted through the occupational health program of a large health insurance company in Germany, targeting the general working population.		
	Sample size: 264	Mean age: 43.3	Female ratio: 73.1%
Intervention(s)	Domain: Mental health and stress, working atmosphere		
	Type: Mindfulness and relaxation, education and training opportunities		
	The intervention was an internet-based, mobile-supported stress management program called "GET.ON Stress." It consisted of seven sessions focused on problem-solving and emotion regulation techniques, along with a refresher session. Participants received personalized feedback from an e-coach to support their progress.		
	Duration: 2.5 months		
	Setting: Digital (web/app-based)		
Comparator	Waiting list control group (WLC) with unrestricted access to care as usual.		
Outcome	Outcome measure(s): ROI, net benefit, cost-effectiveness ratio, cost-benefit ratio		
	Self-reported data for cost-benefit analysis (6 months), ICER (6 months) for the employer (including intervention costs, costs due to absenteeism and presenteeism), cost-benefit analysis, symptoms		
Results	The intervention showed a net benefit of €181 per participant in the first six months, with a benefit-cost ratio of 1.6. The ROI was €0.61 per euro invested. The ICER was -521 €, indicating that the intervention was more effective and cost-saving compared to usual care.		

(38) Elson et al. (2019)

Title	Cost-benefit analysis of an employee assistance program for a geographically dispersed workforce in South Australia		
Country scope	Australia		
Industry scope	Consumer discretionary		
Study type	Modeling		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees of the South Australian Department of Education, with 40.2% residing outside the Adelaide metropolitan area.		
	Sample size: 1,984	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Mental health and stress		
	Type: Mindfulness and relaxation, mental health initiatives/training		
	The South Australian Department of Education offers an Employee Assistance Program (EAP) with up to six fully funded counseling sessions per year, available through phone, in-person (in city areas), or online via Zoom.		
	Duration: 12 months		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): Cost-benefit ratio		
	Primary: Registry-based cost-benefit ratio (including absenteeism and presenteeism estimates) Secondary: Costs and benefits of the EAP, EAP utilization, and employee satisfaction		
Results	The Employee Assistance Program (EAP) cost AUD 409.27 per user (AUD 14.26 per employee). By reducing teacher sick leave, the Ministry saved approximately AUD 96,787 in substitute teacher costs in 2018. The program reported a Cost-benefit ratio of 3.34, ranging from 2.84 to 3.84.		

(39) Framke et al. (2016)

Title	Effect of a participatory organizational-level occupational health intervention on short-term sickness absence: a cluster randomized controlled trial		
Country scope	Denmark		
Industry scope	Consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Pedagogical leaders, teachers, teaching assistants, and other staff employed at one of the 78 participating preschools in the municipality of Copenhagen between June 2011 and December 2013.		
	Sample size: 2,576	Mean age: 38.4	Female ratio: 81.7%
Intervention(s)	Domain: Working atmosphere		
	Type: Work climate change		
	The "Pioneer Project" was a 25-month participative intervention designed to improve workplace conditions by focusing on core tasks and reducing unnecessary duties. It consisted of four phases: planning, development with employee input, implementation, and self-evaluation. Activities included workshops, change management training, advisory support, seminars for steering groups, training on workplace culture, and ongoing support from workplace environment advisors.		
	Duration: 34 months		
	Setting: In-person		
Comparator	The control group included 34 preschools with 1,279 employees who did not receive any intervention.		
Outcome	Outcome measure(s): Sick days		
	Registry data on incidence rate of short-term sickness absence (≤14 calendar days) during a follow-up period of 29 months		
Results	The intervention group had 8.68 days of short-term sickness absence per person-year, compared to 9.17 days in the control group. The rate ratio (RR) was 0.93 (95% CI: 0.86–1.00), indicating a significantly lower risk of short-term sickness absence in the intervention group.		

(40) Freund et al. (2024)

Title	A Universal Digital Stress Management Intervention for Employees: Randomized Controlled Trial with Health-Economic Evaluation		
Country scope	Germany		
Industry scope	N/A		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees in Germany		
	Sample size: 396	Mean age: 41.76	Female ratio: 76%
Intervention(s)	Domain: Mental health & stress, working atmosphere		
	Type: Mindfulness and relaxation, education and training opportunities		
	The GET.ON Stress digital stress management intervention included seven modules and a follow-up session, focusing on psychoeducation, problem-solving, emotion regulation, and future planning. Based on the transactional stress model, it featured interactive training, exercises, reports, and multimedia content. Homework, behavior planning, and an online diary helped integrate the new knowledge. Participants could also receive automatic text messages on their mobile phones.		
	Duration: 6 months		
	Setting: Digital (web/app-based)		
Comparator	The control group was a waiting list control group (WLC). Participants in both study groups had full access to care as usual		
Outcome	Outcome measure(s): Cost-benefit assessment (CBA), cost-effectiveness ratio, cost utility (CUA), net benefit, ROI		
	Health outcome in the cost-effectiveness analysis (CEA) was the symptom-free status based on the Perceived Stress Scale (PSS)		
Results	ROI: The intervention had a high probability (78%) of a positive ROI. The ROI was calculated at 77%. Net benefit: The net benefit per participant in the intervention group was €76. Cost effectiveness: The iSMI intervention had a 94% likelihood of being cost-effective compared to the waitlist control, based on a willingness-to-pay threshold of €1500 (US \$1645.37) per additional symptom-free individual. Cost utility: The intervention showed a high probability of being cost-effective. With a willingness to pay of € 20,000 per QALY gained, the probability was 80%		

(41) Geraedts et al. (2015)

Title	Economic Evaluation of a Web-Based Guided Self-Help Intervention for Employees With Depressive Symptoms		
Country scope	Netherlands		
Industry scope	Financials, Industrials, Consumer Services, Not assignable		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees with increased depressive symptoms who were not on sick leave from six companies: two banks, two research organizations, a security company, and a university. Employees who scored 16 or more points on the Centre for Epidemiologic Studies Depression Scale were eligible to participate.		
	Sample size: 231	Mean age: 43.4	Female ratio: 62.3%
Intervention(s)	Domain: Mental health and stress		
	Type: Mindfulness and relaxation, mental health initiatives/training		
	"Happy@Work" was a short, minimally guided self-help intervention combining problem-solving and cognitive therapy. It consists of six weekly lessons, each covering a different topic with information, examples, and tasks. Participants received feedback from a coach, a trained Master's student in clinical psychology, with all feedback reviewed by a supervisor to ensure treatment fidelity.		
	Duration: 1.5 months		
	Setting: Digital (web/app-based)		
Comparator	Usual care which included an email with the result of the randomization and the advice to contact their family doctor, company doctor or a psychologist if necessary.		
Outcome	Outcome measure(s): ROI, net benefit, cost-effectiveness ratio, cost-benefit-ratio, cost utility		
	ROI calculation includes the intervention costs and the changes in the costs of absenteeism, presenteeism and company medical care		
Results	The average ROI was 178% (95% CI: -2466 to 2863), with a 63% chance of positive financial return. The net benefit was €508 (95% CI: -7029 to 8039), and the BCR was 2.8 (CI: -25.7 to 27.6). The cost-effectiveness probability was 55% with a WTP of €0, rising to 95% at €3500 per CES-D point improvement. No significant effect on quality-adjusted life years was found.		

(42) Goetzel et al. (2014)

Title	Estimating the Return on Investment From a Health Risk Management Program Offered to Small Colorado-Based Employers		
Country scope	United States		
Industry scope	Not assignable		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees from small businesses in Colorado, USA, spanning various industries.		
	Sample size: 2,458	Mean age: 43	Female ratio: 34%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management., health monitoring programs, mindfulness and relaxation		
	Health Risk Management program, including annual employee health assessments capturing biometric and lifestyle data (diet, exercise, tobacco/alcohol use, stress). Employees received personalized wellness reports, unlimited health coaching via phone in English and Spanish, and access to online tools like videos, behavior change programs (e.g., smoking cessation, weight loss), and health articles. Employers received aggregated health reports identifying workforce risks and estimating productivity losses due to illness.		
	Duration: 12 months		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): ROI		
	Self-reporting-based ROI, productivity, health status		
Results	The analysis reveals a Return on Investment (ROI) of \$2.03 per dollar invested, considering both medical cost savings and productivity gains. This ROI comprises \$0.58 from medical cost reductions and \$1.45 from improved productivity. Over a one-year period, total medical costs for employees amounted to \$11.2 million. By addressing ten key health risk factors, cumulative savings were projected to reach \$124,867 in medical costs.		

(43) Gregson et al. (2023)

Title	Worksite exercise intervention for hospital health care providers: Outcomes and resource utilization of a pilot study		
Country scope	Denmark		
Industry scope	Health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Hospital employees in a Danish hospital department including nurses, doctors, secretaries and care assistants.		
	Sample size: 80	Mean age: 44.4	Female ratio: 81.3%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs		
	The program consisted of two 30-minute sessions per week, incorporating aerobics, resistance training, and balance exercises. It was supervised by qualified trainers and followed the "intelligent training" concept, which was tailored to the individual needs and abilities of the participants.		
	Duration: 3 months		
	Setting: In-person		
Comparator	Non-participants in the same department.		
Outcome	Outcome measure(s): Sickness absence hours		
	Registry data on sick hours (3 months), intervention costs, self-reported quality of life, commitment to work, social capital in the workplace		
Results	There was no statistically significant difference in sickness-related absenteeism between the intervention group (those who participated in the training program) and the comparison group (non-participants). The mean difference in total sick days was 18.8 hours (60.5 hours in the intervention group vs. 79.2 hours in the comparison group, p = 0.64). For sickness-related absences during working hours, the mean difference was 8.3 hours (43.6 hours in the intervention group vs. 52.0 hours in the comparison group, p = 0.87).		

(44) Groeneveld et al. (2011)

Title	Cost-Effectiveness and Cost-Benefit of a Lifestyle Intervention for Workers in the Construction Industry at Risk for Cardiovascular Disease		
Country scope	Netherlands		
Industry scope	Industrials		
Study type	Netherland		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Construction workers aged 18 to 65 with an increased risk of cardiovascular disease (CVD). Participants that stated that they wanted to improve their physical activity or diet were included in the study.		
	Sample size: 573	Mean age: Not provided	Female ratio: 0%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management		
	Personalized lifestyle intervention including face to face counselling (3 sessions lasting 45 to 60 minutes), telephone counselling (4 sessions lasting 15 to 30 minutes), and brochures on healthy lifestyles and CVD.		
	Duration: 6 months		
	Setting: In-person, phone-based		
Comparator	Regular care by the company doctor, which consisted of brief information about the CVD risk profile.		
Outcome	Outcome measure(s): Cost savings		
	Costs included trainer fees, handbook printing, consultation (in-person/phone), €15 reimbursement per session, and coordination expenses while benefits incl savings from reduced absenteeism, calculated at €264/day for employees and €216/day for workers. ICER calculated only for social perspective.		
Results	Regarding cost savings the analysis revealed a net loss of € 254 (95% CI: -1070 to 1536) per employee for the employer. The ICER (from social perspective) was € 145 per kilogram of weight loss, meaning that the society would have to invest €145 to achieve an additional kilogram of weight loss compared to standard care. The intervention could be considered cost-effective if society was willing to pay €2000 for an extra kilogram of weight loss.		

(45) Gubler et al. (2017)

Title	Doing Well by Making Well: The Impact of Corporate Wellness Programs on Employee Productivity		
Country scope	United States		
Industry scope	Industrials		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Production employees in five laundry plants of a large, independent industrial laundry company in the US, called LaundryCo. Managers and non-factory workers (e.g., salespeople) were excluded from the study.		
	Sample size: 111	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Physical health & fitness		
	Type: Health monitoring programs		
	Voluntary and free-of charge company wellness program run by an external provider. Two components included in the program: (1) Participants of the program received a 15% reduction in the monthly insurance premium (~0.4% of wage). (2) The program included annual biometric screenings testing for 42 common health markers, comprehensive health surveys covering medical history and lifestyle behaviors, personalized health reports with results and recommendations, and nurse-led seminar providing individual feedback and referrals for abnormal results.		
	Duration: 36 months		
	Setting: In-person		
Comparator	Employees at a fifth LaundryCo plant that did not participate in the wellness program due to a different insurance plan.		
Outcome	Outcome measure(s): ROI		
	Registry data was used to estimate the ROI of the program by comparing the productivity increases with the program costs.		
Results	Considering the increase in productivity among participants, the decrease in productivity among non-participants and the program costs, an ROI of 76.3% was calculated. The cost of the program was USD 240 per participating employee, including the cost of the external provider and lost working time. The program led to an average increase in productivity of around 4% among the participating employees ("compliers"). This corresponds to one additional working hour per month per employee.		

(46) Hendriksen et al. (2016)

Title	Effectiveness of a Multilevel Workplace Health Promotion Program on Vitality, Health, and Work-Related Outcomes		
Country scope	Netherlands		
Industry scope	Financials		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees of a Dutch insurance company, mainly office staff, including management.		
	Sample size: 433	Mean age: 42.2	Female ratio: 52.9%
Intervention(s)	Domain: Physical health and fitness, working atmosphere		
	Type: Health monitoring programs, work climate change		
	The study introduced a multi-stage workplace health promotion program, which included management training to promote vitality, team workshops and discussions to motivate compliance, and personalized health assessments with coaching for individuals.		
	Duration: 5 months		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): Sickness absence rate		
	Primary: Registry data on sick days (Average percentage of sick leave), presenteeism, vitality, and performance Secondary: Health and well-being outcomes, behavior, and work-life balance		
Results	The intervention significantly reduced sickness absence, with a drop in the percentage of absent employees from 48.4% at baseline to 32.0% after 15 months, showing a long-term positive effect on sickness rates.		

(47) Hengel et al. (2013)

Title	The effectiveness of a construction worksite prevention program on work ability, health, and sick leave: results from a cluster randomized controlled trial		
Country scope	Netherlands		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Participants were recruited from 15 departments of six Dutch construction companies specializing in house, commercial, or industrial building. Participation required workers to perform construction work.		
	Sample size: 293	Mean age: 42.8	Female ratio: 0.8%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, mindfulness and relaxation		
	The intervention included a physical component with two 30-minute training sessions with a physical therapist and a rest-break tool, and a mental component with two one-hour empowerment training sessions at the worksite.		
	Duration: 6 months		
	Setting: In-person		
Comparator	No intervention.		
Outcome	Outcome measure(s): Sick days (dichotomized)		
	Primary: Ability to work, mental and physical health Secondary outcomes: Registry data on sick days (6-month prevalence of no or short-term sick leave [0–5 days] and long-term sick leave [>6 days]) and occurrence of musculoskeletal symptoms		
Results	In relative terms, the intervention group showed a lower 6-month and 12-month prevalence of long-term sick leave compared to the control group, although the differences were not statistically significant.		

(48) Hengel et al. (2014)

Title	Prevention Program at Construction Worksites Aimed at Improving Health and Work Ability Is Cost-Saving to the Employer: Results From an RCT		
Country scope	Netherlands		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Construction workers from 15 departments of six companies specializing in house, commercial, or industrial construction, including those actively performing construction work.		
	Sample size: 293	Mean age: 42.8	Female ratio: 0.8%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, mindfulness and relaxation		
	The intervention included a physical component with two 30-minute individual training sessions with a physical therapist and a rest-break tool, and a mental component with two one-hour interactive empowerment training sessions at the worksite in a construction trailer.		
	Duration: 6 months		
	Setting: In-person		
Comparator	The control group received usual practice, consisting only of the mandatory training required by Dutch companies for employees to obtain a health and safety certificate.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry and self-reported data on cost savings, net benefit, cost-benefit, ROI (difference between monetary benefits [sickness absence] and intervention costs [costs of intervention and costs due to productivity losses]), ability to work, physical and mental health Secondary: Musculoskeletal symptoms		
Results	The intervention yielded a positive financial return for the employer by reducing sickness absence costs. For every euro invested, 6.4€ were saved, with a net benefit of 641€ per employee and an ROI of 544%. The intervention group had 8.5 fewer sick days than the control group. This positive return remained consistent in sensitivity analyses considering presenteeism costs.		

(49) Herman et al. (2008)

Title	Cost-effectiveness of Naturopathic Care for Chronic Low Back Pain		
Country scope	Not provided		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees with chronic back pain. Participants included warehouse workers who were diagnosed with chronic back pain of at least 6 weeks duration and who were not on sick leave.		
	Sample size: 70	Mean age: 46.58	Female ratio: 50%
Intervention(s)	Domain: Mental health and stress, physical health and fitness		
	Type: Exercise programs, nutrition and weight management, mindfulness and relaxation		
	The treatment included acupuncture, relaxation exercises, physical exercise, nutritional counselling, 30-minutes semi-weekly naturopathic treatment, and a back training brochure.		
	Duration: 3 months		
	Setting: In-person		
Comparator	30-minutes semi-weekly standardized physiotherapy education and a brochure on back training		
Outcome	Outcome measure(s): ROI		
	ROI was estimated by comparing the costs per day of absence avoided with the costs to the employer due to productivity losses		
Results	The investment in naturopathic treatment led to a return on investment of 7.9 % over a period of 6 months. The positive ROI was driven by a reduction in days of absence. The cost per day of absence avoided was USD 154 which was lower compared to the 172 US dollars that the employer suffers per day of absence due to lost productivity.		

(50) Hughes et al. (2007)

Title	A Lifestyle-Based Weight Management Program Delivered to Employees of Health and Economic Outcomes		
Country scope	United States		
Industry scope	N/A		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	The study focused on overweight or obese employees (average weight of 113 kg and BMI of 39 kg/m²) from three Fortune 500 companies in the Pacific Northwest of the United States. Most participants were middle-aged men and women, with job roles that did not require significant physical activity.		
	Sample size: 516	Mean age: 39	Female ratio: 65%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management., health monitoring programs		
	The employer-sponsored weight management program focused on physical activity, dietary modification, behavioral counseling, and medical monitoring. The intervention was based on the National Institutes of Health's clinical guidelines for weight management.		
	Duration: 12 months		
	Setting: In-person		
Comparator	N/A		
Outcome	Outcome measure(s): Sick days		
	Self-reported data on sick days (3 months), physical parameters (e.g., BMI, weight, blood pressure), number of doctor visits, medication use		
Results	The program led to a significant reduction in self-reported sick days, from an average of 3.1 at baseline to 1.1 at the end of the intervention (P = 0.04). Participants experienced an average weight loss of 5.4%, along with improvements in blood pressure, waist circumference, and BMI. Additionally, depressive symptoms, as measured by the Beck Depression Inventory, decreased by 57.1%. The average number of prescription medications per participant fell by 44%, resulting in estimated annual medication cost savings of \$2,382 per participant.		

(51) Iijima et al. (2013)

Title	Cost-benefit Analysis of Comprehensive Mental Health Prevention Programs in Japanese Workplaces: A Pilot Study		
Country scope	Japan		
Industry scope	N/A		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	The study involved employees from 11 large companies (average size: 5,543 employees) that had already implemented mental health prevention programs.		
	Sample size: 12,864	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Mental health and stress		
	Type: Mindfulness and relaxation, mental health initiatives/training		
	The program followed Japanese health guidelines with three prevention levels: Primary (education and workplace improvements), Secondary (early detection via health checks and surveys), and Tertiary (support for reintegration through consultations and coordination).		
	Duration: N/A		
	Setting: N/A		
Comparator	Companies with a ROI of more than one was compared to companies with a ROI of less than one.		
Outcome	Outcome measure(s): ROI, net benefit		
	Productivity and costs for sick pay		
Results	The mental health prevention programs had an average ROI of 1.55, with seven of eleven companies exceeding an ROI of one. The average net benefit per employee was 6,921 yen. Companies with a higher ROI had 12 fewer sick days per employee and lower overall costs, emphasizing the financial advantages of comprehensive mental health strategies.		

(52) Ikegami et al. (2010)

Title	The Effects of a Mental Health Training Program for Manufacturing Company Managers		
Country scope	Japan		
Industry scope	Technology		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees at all levels in a Japanese electronics company, mainly technicians and engineers who worked in production or in research and development.		
	Sample size: 1,420	Mean age: 35.2	Female ratio: 16%
Intervention(s)	Domain: Mental health and stress, working atmosphere		
	Type: Work climate change, mental health initiatives/training		
	The intervention was a mental health training program for managers, focusing on Active Listening (AL) to improve communication and support employees. It included role-plays and group discussions to enhance mutual understanding. Managers received feedback on their department's Brief Job Stress Questionnaire (BJSQ) results, with follow-up sessions offering further training, support, and counseling for participants.		
	Duration: N/A		
	Setting: In-person		
Comparator	Baseline data prior to the interventions were used as a control		
Outcome	Outcome measure(s): Sickness absence rate		
	Absence rate measured as the number of employees on sick leave for more than one month due to mental health problems		
Results	The number of employees who were on sick leave for longer than one month due to mental health problems halved in 2006 and 2007 compared to the years before 2005. After the implementation of the program, which included Active Listening Training, the values for "quantitative workload", "qualitative workload" and "physical demands" compared to the baseline.		

(53) Jenny et al. (2011)

Title	Projekt SWiNG – Schlussbericht der Evaluation		
Country scope	Switzerland		
Industry scope	Industrials, utilities, consumer goods, health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees in eight pilot companies in Switzerland that all differ in size, sector and language region.		
	Sample size: 5,014	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Mental health and stress, working atmosphere		
	Type: Mindfulness and relaxation, work climate change		
	SWiNG Project utilizes a multifaceted intervention strategy to address workplace stress and promote employee health. Key elements of the intervention include S-Tool assessment, stress management courses, leadership training, and the formation of collaborative groups.		
	Duration: N/A		
	Setting: Digital (web/app-based), in-person		
Comparator	People who have not taken part in the stress management course		
Outcome	Outcome measure(s): ROI		
	Economic effectiveness of SWiNG including ROI calculation		
Results	ROI of 0.53 at 1 year post intervention end. Approximately 3 years after intervention end ROI of ~1. Overall, employees showed a positive impact on participants’ resource-to-strain ratio, health outcomes, work performance. Beyond individual-level improvements, SWiNG catalyzed significant organizational changes including the creation of leadership forums, integration of health-related content into existing training programs, and modification of meeting agendas to address well-being concerns.		

(54) Jorgensen et al. (2011)

Title	Effects on musculoskeletal pain, work ability and sickness absence in a 1-year randomized controlled trial among cleaners		
Country scope	Denmark		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Cleaning staff from nine different cleaning companies in Denmark. Participants needed to be employed at least 20 hours/week, work mainly during the day, and with the main task being cleaning.		
	Sample size: 363	Mean age: 45	Female ratio: 100%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs		
	Two interventions: (1) Physical coordination training (PCT) and cognitive behavioral training (CBTr). The PCT consisted of weekly 20-minute sessions at the workplace under the guidance of a trainer during the first 3 months. The training focused on intensive exercises to activate the stabilizing muscles around the trunk and shoulder girdle. (2) The CBT consists of group sessions led by a trained group leader twice a month for 2 hours at the workplace during the first 3 months. The training included group discussions on pain-related dysfunctional attitudes, coping and management, as well as the promotion of functional.		
	Duration: 12 months		
	Setting: Phone-based		
Comparator	The comparison group received a one-hour health check (incl. lung function test and an aerobic capacity test).		
Outcome	Outcome measure(s): Sick days		
	Sick days were measured as median sickness absence days at follow-up (12 months)		
Results	No significant effects of CBT or PCT on the ability to work or sick leave were found. The reference group had median sickness absence days of 2 at follow-up, meanwhile the PCT and CBT group showed 4.25 and 3.0 median days respectively.		

(55) Kapinos et al. (2015)

Title	Does Targeting Higher Health Risk Employees or Increasing Intervention Intensity Yield Savings in a Workplace Wellness Program?		
Country scope	United States		
Industry scope	N/A		
Study type	Cohort study		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees in a large US company at increased risk of developing chronic diseases. The study focused on employees who were more actively engaged in the program.		
	Sample size: 20,251	Mean age: 37.56	Female ratio: 39.15%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management, mindfulness and relaxation		
	The wellness program included chronic condition management and lifestyle promotion. Employees completed a 20-minute Health Risk Assessment (HRA), which led to tailored coaching and support. High-risk employees received intensified coaching to address obesity, hypertension, diabetes, and high cholesterol.		
	Duration: N/A		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	No intervention.		
Outcome	Outcome measure(s): Cost savings		
	Third-party reported healthcare costs (prescription drugs, inpatient and outpatient costs)		
Results	There was no evidence that the pre-disease program targeting employees at increased risk of chronic diseases led to cost savings. However, participants in the lifestyle management program who attended five or more sessions per year had about \$20 lower medical costs compared to matched peers. Overall, the findings suggest that the preventative components of workplace wellness programs do not significantly reduce healthcare costs.		

(56) Karlsson et al. (2024)

Title	Is a Problem-Solving Intervention with Workplace Involvement for Employees on Sickness Absence Due to Common Mental Disorders More Effective, than Care as Usual, in Reducing Sickness Absence Days? Results of a Cluster-Randomised Controlled Trial in Primary Health Care		
Country scope	Sweden		
Industry scope	Not specified		
Study type	RCT		
JBİ evaluation	Risk of bias: Low		
PICO framework			
Population	Leaders and employees aged 18 to 59 who were on sick leave for 2 to 12 weeks, primarily due to a diagnosis of mild to moderate depression, anxiety disorder, or adjustment disorder.		
	Sample size: 197	Mean age: 42	Female ratio: 85%
Intervention(s)	Domain: Working atmosphere		
	Type: Education & training opportunities		
	The PSI-WPI intervention involved rehabilitation coordinators delivering a structured problem-solving approach in 2–5 sessions, starting one week after study entry. It followed five steps: employee assessment, manager consultation, solution brainstorming, action plan creation, and a joint meeting for finalization and implementation.		
	Duration: Not specified		
	Setting: In-person, phone based		
Comparator	Care as usual (CAU), which typically includes cognitive behavioral therapy or antidepressants.		
Outcome	Outcome measure(s): Sick days		
	Registry data (18 months)		
Results	The authors found no significant reduction in sickness absence for the intervention. At month 12, the mean absence was 3.2 days for CAU and 5.7 days for the intervention group, with a mean difference of 2.5 days (95% CI: 0.95–3.27). Over the study period, the estimated mean difference was 2.24 days (95% CI: 1.85–2.64), suggesting that PSI-WPI was not more effective than CAU in reducing sick days.		

(57) Keus van de Poll et al. (2020)

Title	Preventing sickness absence among employees with common mental disorders or stress-related symptoms at work: a cluster randomised controlled trial of a problem-solving-based intervention conducted by the Occupational Health Services		
Country scope	Sweden		
Industry scope	Not specified		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees with general mental disorders or work-related stress symptoms with less than 3 months of sick leave due to common mental disorders (CMD).		
	Sample size: 100	Mean age: 43.33	Female ratio: 80%
Intervention(s)	Domain: Working atmosphere		
	Type: Education & training opportunities		
	OHS consultants received one day of training to support work adjustments and stress management, addressing six workplace factors (workload, control, reward, community, fairness, values) using problem-solving techniques. The intervention included interviews, a joint meeting, and at least three follow-ups over three months.		
	Duration: 1.5 months		
	Setting: In-person		
Comparator	OHS consultants in the CAU group received a one-hour introduction to psychosocial and mental health factors, without the same theoretical framework as the intervention group.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data (12 months) Secondary: Self-reported sick days every 4 weeks, RTW and production loss		
Results	The PSI group showed a significant reduction in sick days, particularly from months 5 to 8, with a total difference of 30.68 days over 12 months compared to CAU. While the PSI group also improved in mental health and earlier partial return to work, these changes were not statistically significant. The mean effect size was -2.59 (CI: -3.96 to -1.21).		

(58) Keus van de Poll et al. (2020)

Title	Cost-Effectiveness of a Problem-Solving Intervention Aimed to Prevent Sickness Absence among Employees with Common Mental Disorders or Occupational Stress		
Country scope	Sweden		
Industry scope	Not specified		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Workers who sought support from one of three occupational health services due to work-related stress or CMD symptoms affecting their ability to work.		
	Sample size: 100	Mean age: 43.33	Female ratio: 80%
Intervention(s)	Domain: Working atmosphere		
	Type: Education and training opportunities		
	OHS consultants received one day of training to support work adjustments and stress management, addressing six workplace factors (workload, control, reward, community, fairness, values) using problem-solving techniques. The intervention included interviews, a joint meeting, and at least three follow-ups over three months.		
	Duration: Not specified		
	Setting: Digital, in-person		
Comparator	OHS consultants in the CAU group received a one-hour introduction to psychosocial and mental health factors, without the same theoretical framework as the intervention group.		
Outcome	Outcome measure(s): Net benefit, Cost-benefit (CBA), Cost-effectiveness ratio		
	Other outcomes measures included sick days (12 months) - see also study number 57		
Results	The study found that PSI recipients had at least 15 fewer long-term sick leave days over one year compared to CAU. Cost-effectiveness was not demonstrated from the employer's perspective, but PSI was cost-beneficial from a societal standpoint.		

(59) Klasen et al. (2021)

Title	Efficacy of an indicated prevention strategy on sickness absence and termination of the employment contract: a 5-year follow-up study		
Country scope	Netherlands		
Industry scope	Not specified		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees at high risk of future long-term sickness absence (LTSA) with mild depressive symptoms were included. Depressive symptoms were assessed using the Hospital Anxiety and Depression Scale (HAD-D).		
	Sample size: 139	Mean age: 47.7	Female ratio: 38.9%
Intervention(s)	Domain: Mental health		
	Type: Mental health initiatives		
	The intervention group received psychological treatment based on problem-solving therapy (PST) and cognitive-behavioral therapy (CBT). Employees were offered up to seven 45-minute individual sessions, with homework reviewed in each session, extendable to 13 if needed. Ten psychologists, trained through a two-day pre-intervention program and a one-day booster during the study, facilitated the sessions.		
	Duration: Not specified		
	Setting: In-person		
Comparator	The control groups in both RCTs received usual care, meaning support was provided only when requested.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data on sick days (12 months) Secondary: Termination of the employment relationship		
Results	RCT 2 found no significant differences in sickness absence duration or frequency between groups after 12 months. After 3–5 years, the control group had fewer sick days, but the difference was uncertain and not statistically significant in ITT and PP analyses.		

(60) Kobayashi et al. (2008)

Title	Effects of a Worker Participatory Program for Improving Work Environments on Job Stressors and Mental Health among Workers: A Controlled Trial		
Country scope	Japan		
Industry scope	Industrials		
Study type	Controlled Trial		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Office workers in a large steel manufacturing company, excluding departments that worked in shifts.		
	Sample size: 1,070	Mean age: 41.9	Female ratio: 11%
Intervention(s)	Domain: Working atmosphere		
	Type: Work climate change		
	The participatory program aimed to improve the working environment using the Mental Health Action Checklist for a Better Workplace Environment. The intervention included the following steps: forming a team to improve the working environment, creating a work stress profile, planning workshops, and implementing action plans.		
	Duration: 6 months		
	Setting: In-person		
Comparator	No intervention.		
Outcome	Outcome measure(s): Sick days (dichotomized)		
	Registry data on sick days (0 or ≥1), psychological distress and health risks		
Results	The intervention had no significant effect on sick days over one year, with the following reasons provided: low frequency of sick days, the follow-up measurement covering 12 months during which the measures were still being implemented, and a small sample size for women, particularly in the intervention group.		

(61) Krampen (2010)

Title	Evaluation of a Program on Systematic Self-Monitoring and Reflection of Health Behavior in Organisations: Results of Two Randomised Controlled Studies on Well-Being and Absenteeism of Employees and Skilled Workers (Study 1)		
Country scope	Germany		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees from the public service of a state administrative organization, selected due to increasing absenteeism.		
	Sample size: 56	Mean age: 41.4	Female ratio: 47%
Intervention(s)	Domain: Physical health and fitness, mental health, working atmosphere		
	Type: Exercise programs, nutrition and weight management, mindfulness and relaxation, work climate change		
	The intervention in both studies is the SySeRe program, which focuses on systematic self-observation and reflection on health behavior, encouraging participants to independently find ways to improve their health and attitudes. The program is conducted in small groups of up to 15 participants, who meet weekly for 90 to 120 minutes. It covers six areas of life and behavior: eating and drinking habits (including alcohol), drug and tobacco use (including medications), physical activity, media consumption, social relationships, and stress reactions and coping.		
	Duration: 2 months		
	Setting: In-person		
Comparator	Waiting list control group		
Outcome	Outcome measure(s): Sick days		
	Registry data on sick days (12 months) as well as psychosomatic complaints, subjective well-being, personal self-regulation of development		
Results	In Study 1, the intervention group showed 1.9 days of absenteeism, while the control group had 7.3 days, resulting in a mean difference of 5.4 fewer sick days during the follow-up period (last 2 months).		

(62) Larsen et al. (2019)

Title	The effect of strengthening health literacy in nursing homes on employee pain and consequences of pain – a stepped-wedge intervention trial		
Country scope	Denmark		
Industry scope	Health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	All types of nursing home staff. Nursing assistants who were either trained social and health care assistants or assistants with 1-2 years of vocational training. Managers were primarily registered nurses and carers. Other employees included kitchen, cleaning and technical staff.		
	Sample size: 405	Mean age: 47	Female ratio: 89%
Intervention(s)	Domain: Working atmosphere		
	Type: Education and training opportunities		
	Organizational intervention to strengthen health literacy in the workplace in nursing homes. The intervention consisted of two elements: (1) Training for staff and management to create knowledge on pain prevention and management with communication tools. (2) Structured dialogues between staff and supervisors to develop action plans to prevent and reduce pain.		
	Duration: 6 months		
	Setting: N/A		
Comparator	The comparison group consisted of the same employees before the intervention		
Outcome	Outcome measure(s): Sick days		
	Sick days measures with self-reporting survey every 4-week capturing the number of days (0-28) participants were absent from work due to pain in muscles and joints		
Results	Intervention showed no significant overall effect on the number of sick days taken by employees. The reduction in sick days by -0.22 days (95% CI -0.57 0.14) per month was observed but was not statistically significant. Sensitivity analysis focusing on employees with an initial pain level of >3 showed a significant reduction in sick days by 0.65 days (95% CI -1.23-0.07).		

(63) Lerner et al. (2020)

Title	Effect of Adding a Work-Focused Intervention to Integrated Care for Depression in the Veterans Health Administration a Randomized Clinical Trial		
Country scope	United States		
Industry scope	N/A		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Veterans aged 18 years or older with at least 15 working hours per week in a job held for at least 6 months suffering from work-related restrictions and a current major depressive disorder or a persistent depressive disorder.		
	Sample size: 253	Mean age: 45.7	Female ratio: 14.8%
Intervention(s)	Domain: Mental health and stress		
	Type: Mental health initiatives/training		
	Participants received integrated care (IC) and the "Be Well at Work" (BWA) program. IC included depression treatment through screening, clinical informatics, measurement-based care, and referrals to psychiatric services. BWA provided eight biweekly telephone sessions, followed by a follow-up call, with PhD-level psychologists helping patients address work-related barriers and apply cognitive-behavioral strategies and job modifications.		
	Duration: 4 months		
	Setting: Phone-based		
Comparator	Only integrated care (IC) without work-related counselling (BWA).		
Outcome	Outcome measure(s): ROI		
	Primary: Self-reporting-based ROI (24 months), productivity Secondary: Symptoms development		
Results	The ROI was 160% when both productivity improvements and reduced absenteeism were considered at the 4-month follow-up. When only productivity gains were accounted for, the ROI was 30%. Over a 2-year period, the ROI increased to 421% when factoring in both absenteeism and productivity, and 160% when excluding productivity gains.		

(64) Linden et al. (2014)

Title	Reduction of sickness absence by an occupational health care management program focusing on self-efficacy and self-management		
Country scope	Germany		
Industry scope	Consumer services		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees of a department within the German Federal Pension Insurance.		
	Sample size: 509	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Physical health and fitness, mental health, working atmosphere		
	Type: Exercise programs, Nutrition and weight management, Mindfulness and relaxation, Work climate change		
	The intervention included various courses and public lectures on general health topics, with 69% attendance for workplace reviews, 15.7% for nutrition courses, 5.7% for gymnastics and dance, 5% for stress management, and 5% for laughter courses. A key component was focus groups with nine teams (55% attendance) held outside regular work hours at a rehabilitation center, discussing workspace, tasks, colleagues, support needs, and resources.		
	Duration: Not specified		
	Setting: In-person		
Comparator	The comparator group included two departments of German Federal Pension Insurance, which had similar organization and working methods to the intervention department but did not participate in the OHMP.		
Outcome	Outcome measure(s): Sickness absence rate		
	Registry data on sick day rate (12 months)		
Results	In the year following the intervention, sickness absence in the intervention group decreased from 9.26% to 7.93%, while it increased from 7.9% to 10.7% in the two control groups.		

(65) Losina et al. (2017)

Title	Physical activity and unplanned illness-related work absenteeism: Data from an employee wellness program		
Country scope	United States		
Industry scope	Health care		
Study type	Cohort study		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees of a Dutch insurance company, mainly office staff, including management.		
	Sample size: 292	Mean age: 38.5	Female ratio: 83%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs		
	The program aimed at increasing physical activity, where participants used a fitness tracker. Teams of three earned financial rewards for meeting weekly activity goals (e.g., +10% compared to the previous week).		
	Duration: 6 months		
	Setting: In-person, digital (web/app-based)		
Comparator	The study compared groups based on weekly activity levels: low (0-74 minutes), medium (75-149 minutes), and those meeting CDC guidelines (≥150 minutes/week).		
Outcome	Outcome measure(s): Sickness absence hours		
	Self-reported data on sick hours (6 months)		
Results	The study found that lower physical activity was linked to more sickness-related absences. Sick leave decreased as physical activity increased: 5 hours for ≥150 minutes/week, 11 hours for 75–149 minutes/week, and 19 hours for 0–74 minutes/week. After adjusting for factors like age, race, education, and chronic conditions, those in the middle activity group were 2.4 times more likely to take unplanned sick leave, while those in the lowest group were 3.5 times more likely, compared to the most active group.		

(66) Makrides et al. (2011)

Title	The Healthy Lifeworks Project. A Pilot Study of the Economic Analysis of a Comprehensive Workplace Wellness Program in a Canadian Government Department		
Country scope	Canada		
Industry scope	Not assignable		
Study type	Cohort study		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees of the Department of Justice (DOJ) of the Public Service of Nova Scotia.		
	Sample size: 402	Mean age: 44.9	Female ratio: 61%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs		
	The workplace wellness program included health risk assessments, motivation contests, incentive programs, lifestyle coaching, workshops, and health fairs. It also introduced workplace changes like healthier cafeteria options, healthy meeting snacks, walking paths, and wellness spaces.		
	Duration: N/A		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): Sick days (dichotomized)		
	Registry data on sick days (short-term and general illnesses), drug costs, cost savings, and wellness-Scores		
Results	Employees who maintained a low health risk (0-2 risk factors) showed a slight 4% decrease in absenteeism. Maintaining a low-risk status helped prevent an increase in costs related to short-term and generalized illnesses (STI and GI). However, no causal relationship between the intervention and absenteeism was proven. Estimated cost savings were 248 Canadian dollars per employee per year for each reduction in health risk.		

(67) Meenan et al. (2010)

Title	Economic Evaluation of a Worksite Obesity Prevention and Intervention Trial among Hotel Workers in Hawaii		
Country scope	United States		
Industry scope	Consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Overweight and obese employees (BMI > 25) working in hotels on Oahu, Hawaii. The sample included a diverse ethnic composition, representative of the Hawaiian population.		
	Sample size: 6,958	Mean age: N/A	Female ratio: N/A
Intervention(s)	Domain: Physical health and fitness		
	Type: Nutrition and weight management		
	The "Work, Weight, and Wellness" (3W) program was a two-year weight loss initiative. Level 1 focused on awareness through assessments and feedback, while Level 2 added on-site weight management groups, environmental initiatives, and support in the final year.		
	Duration: 24 months		
	Setting: In-person		
Comparator	Minimal intervention (Level 1)		
Outcome	Outcome measure(s): Net present value		
	Primary: BMI and Waist to height ratio Secondary: Self- and third-party reporting-based ROI and net present value (including medical costs, absenteeism, productivity, and employee fluctuation)		
Results	Both intervention levels resulted in negative NPVs over 24 months. Stage 1 (minimal) had an NPV of -\$341,996, while Stage 2 (intensive) had an NPV of -\$1,173,961. The impact on sick days was inconsistent, based on self-reported data, and no clear positive effect was demonstrated.		

(68) Milani et al. (2009)

Title	Impact of Worksite Wellness Intervention on Cardiac Risk Factors and One-Year Health Care Costs		
Country scope	United States		
Industry scope	N/A		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees and spouses of a single employer.		
	Sample size: 339	Mean age: 40	Female ratio: 52.4%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management., health monitoring programs, mindfulness and relaxation		
	The six-month Risk Assessment and Modification Program (RAMP) by Ochsner Health System included workplace health education, smoking cessation support, stress management, medical referrals, addiction treatment, and fitness center access.		
	Duration: 6 months		
	Setting: In-person		
Comparator	The control group received usual healthcare without RAMP-specific interventions but had access to exercise opportunities during lunch breaks, similar to the intervention group.		
Outcome	Outcome measure(s): ROI, cost savings		
	Registry data on medical costs (total cost of health insurance claims determined for each participant 1 year post intervention) and health outcomes		
Results	Over 12 months post-intervention, medical claim costs averaged \$1,539 per participant in the intervention group (p = .002) and \$2,522 in the control group (not significant), with a statistically significant cost difference (p = 0.01). The intervention generated \$6 in healthcare savings for every \$1 invested.		

(69) Musich et al. (2015)

Title	An Evaluation of the Well at Dell Health Management Program: Health Risk Change and Financial Return on Investment		
Country scope	United States		
Industry scope	Technology		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees of the company Dell who had continuous health insurance coverage between 2010 and 2011.		
	Sample size: 24,651	Mean age: 42	Female ratio: 27%
Intervention(s)	Domain: Physical health and fitness, working atmosphere		
	Type: Health monitoring programs, education and training opportunities		
	“Well at Dell” health management program, which consists of three core components: (1) Health risk assessment (HRA) / Wellness, (2) Lifestyle-Management-Coaching (incl. telephone coaching), and (3) Disease-Management-Coaching (incl. employees who suffered from diabetes, heart disease and/or back pain). Intervention consisted of year-round multi-channel communications and campaigns.		
	Duration: 12 months		
	Setting: Digital (web/app-based), phone-based, in-person		
Comparator	Difference-in-Difference method with people that did not participate in the respective programs.		
Outcome	Outcome measure(s): ROI, net benefit		
	For each program changes in health expenditure per member per year before and after participation between participants and non-participants used for economic calculation.		
Results	ROI of 2.48 with an average program investment of USD 91.46 per participant. The savings resulted in a net profit of USD 135.17 per employee.		

(70) Noben et al. (2014)

Title	Protecting and Promoting Mental Health of Nurses in the Hospital Setting: Is it cost-effective from an employer's perspective		
Country scope	Netherlands		
Industry scope	Health care		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Nurses in an academic hospital in the Netherlands who are at increased risk of mental health problems.		
	Sample size: 413	Mean age: 42.19	Female ratio: 79.7%
Intervention(s)	Domain: Mental health and stress		
	Type: Mental health initiatives/training		
	The intervention includes screening for work ability impairments and six mental health issues: stress, fatigue, drinking, depression, anxiety, and PTSD. Participants receive personalized feedback, and those with positive results are referred to an occupational physician. The physicians follow a seven-step protocol to improve work ability and well-being, supported by a three-hour training on protocol implementation.		
	Duration: 6 months		
	Setting: Digital (web/app-based), in-person		
Comparator	Screening without feedback or referral to the company doctor		
Outcome	Outcome measure(s): ROI, net benefit, cost-benefit-analysis (CBA)		
	Economic evaluation looks at a period of 6 months (without discontinuation of costs and benefits given short 6-month period)		
Results	For every euro invested in the intervention, a profit of 11 € was realized. Sensitivity analyses for ROI ranging from 5 to 11 €. Net savings of 244 € per nurse (employee) were realized when only reduced absenteeism was included. In case higher productivity (inclusion of presenteeism) was taken into account a net benefit of 651 € was realized and statistically significant (p = 0.008). The cost-benefit ratio was calculated at 0.09 €.		

(71) Norwitz et al. (2022)

Title	A Company Is Only as Healthy as Its Workers: A 6-Month Metabolic Health Management Pilot Program Improves Employee Health and Contributes to Cost Savings		
Country scope	United States		
Industry scope	N/A		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees of a manufacturing company with obesity, prediabetes, or diabetes. All participants had a BMI over 35 kg/m² at baseline and were selected based on their perceived medical need.		
	Sample size: 9	Mean age: 52.9	Female ratio: 56%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management		
	The intervention included a ketogenic diet, regular virtual meetings, continuous glucose monitoring, and access to an app with educational content, live streams, group meetings, and a community chat.		
	Duration: 6 months		
	Setting: Digital (web/app-based)		
Comparator	N/A		
Outcome	Outcome measure(s): Cost savings		
	Third-party reporting-based cost savings, weight, metabolic health, and 10-year risk of cardiovascular events		
Results	Improved metabolic health through the program allowed many participants to reduce or discontinue certain medications. Based on drug list prices, total savings over 24 weeks were estimated at USD 45,171.70, averaging ~USD 5,437.33 per participant. Significant health improvements were observed, including an average weight reduction of 17.4 kg.		

(72) Ornek et al. (2020)

Title	Effects of a work-related stress model based mental health promotion program on job stress, stress reactions and coping profiles of women workers: a control groups study		
Country scope	Turkey		
Industry scope	Consumer Discretionary		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Female textile workers with high work-related stress (WRS) were included in the study if they had a job-stress subscale score above 45. Participants who used medication affecting cortisol or IgA were excluded.		
	Sample size: 70	Mean age: 32.3	Female ratio: 100%
Intervention(s)	Domain: Mental health and stress		
	Type: Mindfulness and relaxation		
	The "Work-ProMentH" program, based on the work stress model, included stress management techniques, coping strategies, relaxation exercises, and education on stress physiology, reactions, and related illnesses. The intervention was delivered through a 45-minute session, followed by 12 weeks of reinforcement via reminders, videos, and WhatsApp messages.		
	Duration: 3 months		
	Setting: In-person, phone-based, digital (web/app-based)		
Comparator	Women from another textile factory without intervention.		
Outcome	Outcome measure(s): Sickness absence hours		
	Primary: Self-reported and registry data on sick hours (3 months), work-related stress and stress reactions, social support, performance, and coping strategies Secondary: Biological stress markers such as salivary immunoglobulin A (S-IgA) and cortisol (S-Cortisol)		
Results	Participants in the Work-ProMentH program experienced a significant reduction in absenteeism ($p = .029$; $\eta p^2 = .09$) compared to the control group. Their average hours of absence per month decreased from 12.85 (SD = 11) to 7.65 (SD = 8.17), whereas absenteeism in the control group increased over the study period.		

(73) Proper et al. (2004)

Title	Costs, benefits and effectiveness of worksite physical activity counseling from the employer’s perspective		
Country scope	Netherlands		
Industry scope	Not assignable		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Office workers in the civil service of a Dutch city (Enschede).		
	Sample size: 299	Mean age: 43.74	Female ratio: 34.8%
Intervention(s)	Domain: Physical health & fitness		
	Type: Exercise programs, nutrition and weight management		
	Intervention with seven counselling sessions, each lasting around 20 minutes and was conducted during working hours. Counselling was mainly aimed at promoting physical activity and healthy eating habits, using standardized protocols.		
	Duration: 9 months		
	Setting: In-person		
Comparator	Generally written information on lifestyle factors such as physical activity, diet, alcohol, smoking, (work) stress and musculoskeletal complaints but not counselling intervention.		
Outcome	Outcome measure(s): Cost-benefit (CBA), cost-effectiveness ratio		
	Secondary outcomes measures included sick leave, physical activity, fitness and musculoskeletal complaints.		
Results	The cost-benefit analysis did not reveal any significant cost savings. Although not statistically significant, the difference in the cost of sick days between the intervention and control groups was large. The cost-effectiveness analysis showed that an improvement in energy consumption and cardiorespiratory fitness could be achieved in the intervention group at a higher cost (i.e., €5.2 per additional kilocalorie of energy consumed per day per employee and €235 per beat per minute decrease in submaximal heart rate).		

(74) Rantonen et al. (2018)

Title	Effectiveness of three interventions for secondary prevention of low back pain in the occupational health setting – a randomised controlled trial with a natural course control		
Country scope	Finland		
Industry scope	Basic materials		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees aged 24 to 56 with non-acute, moderate lumbar spine pain (LS) reporting varying levels of physical and mental stress at work.		
	Sample size: 193	Mean age: 45	Female ratio: 34%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs		
	The study analyzed three interventions: multidisciplinary rehabilitation in an outpatient hospital department (Rehab), progressive back training in an outpatient clinic (Physio), and self-care counselling provided by the company doctor (Counselling).		
	Duration: 1, 3 and 5 months		
	Setting: In-person		
Comparator	The control group received care as usual for lumbar spine (LS) pain, with no study visits and only a follow-up questionnaire after two years.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data on sick days (48 months), physical impairment, health-related quality of life, and LWS-intensity Secondary: Disability index, pain-related anxiety, and number illness periods		
Results	None of the three interventions significantly reduced the number of sick days compared to the control group. The mean differences in sick days were: Rehabilitation: -5 days (95% CI: -34 to 24), p = 0.73; Physiotherapy: 1 day (95% CI: -29 to 31), p = 0.94; Counselling: 11 days (95% CI: -22 to 44), p = 0.51.		

(75) Renaud et al. (2008)

Title	Implementation and Outcomes of a Comprehensive Worksite Health Promotion Program		
Country scope	Canada		
Industry scope	Financials		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	The study involved employees from a single branch of a large financial organization in Quebec, Canada. It evaluated 270 employees who participated in at least three modules of a wellness program, including both the first and last modules.		
	Sample size: 270	Mean age: 40.7	Female ratio: N/A
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management, health monitoring programs, mindfulness and relaxation		
	The "Take care of your health!" program ran for three years, offering six modules on global health, stress management, heart health, nutrition, and physical activity. Each 1.5–2-hour session was led by health experts, followed by a personalized health profile sent after four weeks. Participants could opt for a follow-up call with a nurse to review their risk profile.		
	Duration: 36 months		
	Setting: In-person, phone-based		
Comparator	N/A		
Outcome	Outcome measure(s): Sickness absence rate		
	Primary: Self-rated health Secondary: Registry data on sickness absence rate, staff turnover, employee satisfaction, qualitative assessments of the program implementation		
Results	During the study, absenteeism in the company dropped by 28%, while staff turnover decreased by 54%. Additionally, participants reported significant improvements in both their overall health status and their experience of stress.		

(76) Robroek et al. (2012)

Title	Cost-effectiveness of a long-term Internet-delivered worksite health promotion programme on physical activity and nutrition: a cluster randomized controlled trial		
Country scope	Netherlands		
Industry scope	Health care, consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees from six companies in the Netherlands focusing on healthcare, logistics, and public administration.		
	Sample size: 924	Mean age: 42	Female ratio: 51%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management		
	The program included personalized computer-based counseling, online self-monitoring tools, tailored guidance, and opportunities to consult with health professionals. Participants in the intervention group also received monthly e-mail messages during the first 12 months of the study.		
	Duration: 24 months		
	Setting: In-person, digital (web/app-based)		
Comparator	The control group received a standard program that included a health check with personal advice and feedback via a website. Participants also had access to general lifestyle and health information, along with personalized reports based on an online questionnaire.		
Outcome	Outcome measure(s): Sickness absence rate		
	Primary: Compliance with physical activity and diet guidelines Secondary: Self-and third-party reported direct and indirect costs from a societal perspective (including sickness absence rate calculation 12 and 24 months) and health outcomes		
Results	Sickness absence decreased in both groups after one year, with a greater reduction in the control group. After two years, the intervention group saw a larger decrease. Direct healthcare costs averaged 376 euros per participant, while indirect costs totaled 9,476 euros, with 25% from sickness-related absences and 75% from productivity losses.		

(77) Ryan et al. (2018)

Title	Measuring the effectiveness of workplace health program: An Australian example		
Country scope	Australia		
Industry scope	Health Care		
Study type	Pre-post design		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Employees of a metropolitan hospital in Melbourne from the operating theatre, kitchen, technology, cleaning, nursing wards, pathology, angiography, intensive care unit, maternity ward, administration and management.		
	Sample size: 1,400	Mean age: N/A	Female ratio: 86%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, mindfulness and relaxation		
	The program, based on a biopsychosocial approach, included daily 6-minute "take-a-break" group sessions at the start of each shift. These sessions focused on health education, relaxation, posture training, stretching, balance, strengthening, and social interaction. Employees unable to return to work received personalized recovery programs from qualified clinicians.		
	Duration: 36 months		
	Setting: In-person		
Comparator	Injury management data for the three years prior to the implementation of the program (pre-program) with the three years from the start of the program (post-program)		
Outcome	Outcome measure(s): Sick days, insurance claims, cost savings		
	Sick days measured using the "Lost Time Injury Days" (LTI days) - number of days an injured employee was absent from work due to a work injury		
Results	LTI days fell from over 1600 in the year before the program to just over 400 and 200 respectively in the two subsequent years. Time to return to work after a compensable injury was reduced (on average) from 80 days to less than 20 days. Duration of recovery and time to return to work after an injury requiring incapacity for work was reduced by 68%. Overall, the number of compensation claims fell by 46%. Total cost of claims made, including medical treatment and sick pay, decreased from \$350,000 to \$150,000 in the year after the program.		

(78) Saleh et al. (2010)

Title	The Effectiveness and Cost-Effectiveness of a Rural Employer-Based Wellness Program		
Country scope	United States		
Industry scope	Health care, consumer services, financials, not assignable		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees of six rural employers in New York State.		
	Sample size: 151	Mean age: 43.3	Female ratio: 80.3%
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management, health monitoring programs		
	The wellness program included two levels of intervention. Group 1 ("Trail Markers") received an annual health risk assessment (HRA) screening for data collection and year-round awareness messages but no further interventions. Group 2 ("Coaching and Referral") received the same awareness messages and HRA screening, along with one-on-one lifestyle coaching and case management for high-risk individuals.		
	Duration: 48 months		
	Setting: N/A		
Comparator	No intervention or organized health improvement activities; only collection of HRA data		
Outcome	Outcome measure(s): Cost-effectiveness ratio		
	Two cost-effectiveness ratios were calculated: the cost per reduced risk factor and the cost of moving a person to a low-risk classification		
Results	The total costs for the respective study groups amounted to 15,072 US dollars for the control group (~\$100 per employee); 30,143 US dollars for the trail marker group (~\$93.32 per employee); 42,437 US dollars for the coaching and referral group (~\$212.19 per employee). The cost per reduced risk factor was \$776 for the trail marker group compared to \$1,204 for the coaching and referral group. The control group showed no changes in the number of risk factors and an increase in the number and percentage of individuals classified as high-risk, making cost-effectiveness ratios inapplicable for this group.		

(79) Song et al. (2021)

Title	Health And Economic Outcomes Up to Three Years After A Workplace Wellness Program: A Randomized Controlled Trial		
Country scope	United States		
Industry scope	Consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees of BJ's Wholesale Club, a large warehouse retailer with approximately 26,000 employees across over 200 locations in the eastern United States. The study specifically targeted middle- and low-income workers.		
	Sample size: 32,974	Mean age: 38.6	Female ratio: 45.9%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management., mindfulness and relaxation		
	The multi-component workplace wellness program was developed and delivered by Wellness Workdays, an established wellness provider. It included twelve modules covering key prevention and wellbeing topics such as nutrition, exercise, and stress reduction.		
	Duration: 29 months		
	Setting: N/A		
Comparator	No intervention.		
Outcome	Outcome measure(s): Sickness absence rate		
	Registry data on work results (including absence days), self-reported health and behaviors, clinical health markers, and healthcare expenditure and utilization		
Results	The results indicate that the wellness program had no significant effect on absenteeism. The average absenteeism rate was 2.1% in workplaces with the wellness program and 2.2% in control workplaces. The estimated effect of participation in the wellness program on absenteeism was a decrease of 0.21 percentage points (95% CI: -0.46 to 0.04). While absenteeism was slightly lower in workplaces with the wellness program, the difference was not statistically significant.		

(80) Stansfeld et al. (2015)

Title	Pilot study of a cluster randomised trial of a guided e-learning health promotion intervention for managers based on management standards for the improvement of employee well-being and reduction of sickness absence: GEM Study		
Country scope	United Kingdom		
Industry scope	Health care		
Study type	RCT – pilot study		
JBİ evaluation	Risk of bias: Low		
PICO framework			
Population	Staff and managers from four mental health services within an NHS Mental Health Trust in England, excluding employees on long-term sick leave.		
	Sample size: 350	Mean age: N/A	Female ratio: 76%
Intervention(s)	Domain: Mental health		
	Type: Mindfulness and relaxation		
	The intervention was a guided e-learning program on work-related stress for managers, based on HSE management standards. It consisted of six online modules completed weekly or biweekly over three months, with additional introductory and follow-up sessions with a study leader, plus phone and email support.		
	Duration: 3 months		
	Setting: In-person		
Comparator	The comparison group in the GEM study consisted of managers in a psychiatric service who did not receive any intervention.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data (< 21 days), well-being Secondary: Self-reported short-term and long-term sickness absence; further information on psychological distress and acquired knowledge		
Results	The intervention had no significant effect on sickness-related absences, with a mean difference of 0.6 (95% CI: -1.4 to 2.6). A small positive effect was observed on employee well-being, with Warwick-Edinburgh Mental Well-Being Scale values decreasing from 50.4 to 49.0 in the control group and from 51.0 to 49.9 in the intervention group.		

(81) Taimela et al. (2008)

Title	An occupational health intervention programme for workers at high risk for sickness absence. Cost effectiveness analysis based on a randomized controlled trial		
Country scope	Finland		
Industry scope	Industrials, telecommunication		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees with a high risk of sickness absence expressing concerns about their future working ability, pain, impairment, sleep, stress, fatigue, or depression.		
	Sample size: 382	Mean age: 49.5	Female ratio: 6.5%
Intervention(s)	Domain: Physical health and fitness		
	Type: Health monitoring programs		
	The intervention group attended a program conducted by nurses and physicians, where they received personal feedback on the results of their assessment. They were also invited to a consultation with the company health service. During the counselling session, an action plan was developed, and if necessary, referrals to specialists or psychologists were made.		
	Duration: N/A		
	Setting: In-person		
Comparator	The control group was allowed to contact the occupational doctor or nurse upon request. However, they did not receive feedback on the results of the health survey, nor were they invited to a counselling session.		
Outcome	Outcome measure(s): Sick days, cost-effectiveness ratio		
	Self-reported and registry data on sick days (48 months), cost-effectiveness ratio		
Results	The intervention resulted in a saving of €17 per day of illness avoided. Cost-effectiveness remained robust across changes in cost parameters, with a probabilistic sensitivity analysis indicating that the intervention was cost-saving and more effective in over 90% of the simulated cases.		

(82) Taimela et al. (2009)

Title	Effectiveness of a Targeted Occupational Health Intervention in Workers with High Risk of Sickness Absence: Baseline Characteristics and Adherence as Effect Modifying Factors in a Randomized Controlled Trial		
Country scope	Finland		
Industry scope	Industrials, Telecommunications		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Employees at high risk of sickness absence, identified through a questionnaire assessing concerns about work ability, pain, sleep, stress, fatigue, or depression.		
	Sample size: 382	Mean age: 49.5	Female ratio: 6.5%
Intervention(s)	Domain: Physical health and fitness		
	Type: Health monitoring programs		
	The intervention group received a program led by nurses and physicians, with personal feedback on assessment results and an invitation for consultation with the company health service. An action plan was created during the counseling session, and referrals to specialists or psychologists were made if needed.		
	Duration: Not specified		
	Setting: In-person		
Comparator	The control group could contact the occupational doctor or nurse upon request but did not receive feedback on the health survey results or an invitation for counseling sessions.		
Outcome	Outcome measure(s): Sick days		
	Registry data on sick days (12 months)		
Results	The analysis revealed an average difference of 11 days between the treatment arms (95% CI: 1–20 days). Subgroup analyses indicated that the intervention was particularly effective for workers who anticipated being unable to continue their current job due to health issues (-74 days; 95% CI: -105 to -43), those with comorbidities (-22.5 days; 95% CI: -35.5 to -9.5), and those experiencing severe physical impairment at work (-17.5 days; 95% CI: -28.5 to -6.5).		

(83) Thiar et al. (2016)

Title	Internet-Based Cognitive Behavioral Therapy for Insomnia: A Health Economic Evaluation		
Country scope	Germany		
Industry scope	Not assignable		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Teachers with clinically significant insomnia symptoms and work-related brooding.		
	Sample size: 128	Mean age: 48	Female ratio: 74.2%
Intervention(s)	Domain: Mental health and stress		
	Type: Mental health initiatives/training		
	GET.ON Recovery, an internet-based cognitive behavioral therapy for insomnia (iCBT-I) developed specifically for stressed and sleepless workers. The intervention is mainly based on CBT-I methods, including sleep restriction, stimulus control, sleep hygiene and cognitive interventions. The intervention consists of six one-week modules with e-mail feedback from trained clinical psychologists (e-coaches - maximum 30min per session) for each completed module.		
	Duration: 1.5 months		
	Setting: Digital (web/app-based)		
Comparator	Waiting list control group with access to usual treatment		
Outcome	Outcome measure(s): ROI, net benefit, benefit-cost-ratio		
	For the cost benefit analysis benefits represent productivity gains from reduced absenteeism and presenteeism, meanwhile costs reflect the €200 per employee expense for the online training. The base for ICER was the number of teachers with treatment response.		
Results	Cost benefit analyses: A positive financial gain with a net benefit of €417.63 (CI 95%: -593.03 to 1,488.70), a benefit-cost ratio of 3.09 (CI 95%: -1.97 to 8.44), and a ROI of 208.81% (CI 95%: -296.52 to 744.35) could be observed. Cost effectiveness analyses: Savings of €-1.512 (95 % KI: -4.493 bis 1.128) for each participant with a positive treatment outcome after 6 months. The probability of the intervention being cost-effective with a willingness to pay of zero was 87%, and 95% at WTP of €761.		

(84) Tveito and Eriksen (2008)

Title	Integrated health program: a workplace randomized controlled trial		
Country scope	Norway		
Industry scope	Health Care		
Study type	RCT		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Nursing staff in a care home for the elderly		
	Sample size: 40	Mean age: N/A	Female ratio: 100%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, mindfulness and relaxation		
	The integrated health program consists of three main components: physical exercise in the form of one-hour aerobic dance sessions three times per week, 15 hours of information on stress, coping, health, and lifestyle, and a practical workplace examination.		
	Duration: 9 months		
	Setting: In-person		
Comparator	The control group participated only in the pre- and post-tests and received the same intervention program as the intervention group only at the end of the study.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data on sick days (12 months) Secondary: Self-reported psychosocial and health outcomes		
Results	The average number of sick days did not differ significantly between groups (intervention: 52.6, control: 54.4; p = 0.945). Across the study population, sick days increased 2.6-fold over three years. The intervention group reported significant subjective improvements in health, physical fitness, muscle pain, stress management, and work-related health.		

(85) Van den Ven et al. (2023)

Title	Reach and effectiveness of a worksite health promotion program combining a preventive medical examination with motivational interviewing; a quasi-experimental study among workers in low socioeconomic position		
Country scope	Netherlands		
Industry scope	Health care, industrials		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Medium		
PICO framework			
Population	Dutch employees in a low socio-economic position, working in a hospital and a manufacturing company, often performing physically demanding work.		
	Sample size: 176	Mean age: N/A	Female ratio: 84.1%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Exercise programs, nutrition and weight management, mindfulness and relaxation		
	The workplace health promotion program consisted of a preventive medical check-up (PME) followed by up to 7 sessions of coaching with motivational interviewing (MI) over 6 months. The consultation focused on changes in physical activity, smoking, alcohol consumption, nutrition, and relaxation.		
	Duration: 6 months		
	Setting: In-person, digital (web/app-based)		
Comparator	The control group consisted of employees who participated only in the preventive medical check-up (PME) but did not engage in the subsequent motivational interviewing (MI) counseling.		
Outcome	Outcome measure(s): Sick days (dichotomized)		
	Primary: Participation Secondary: Self-reported data on sick days (dichotomized), health and behavioral outcomes, ability to work		
Results	MI coaching had no significant impact on sick days, but 6.2% more participants had fewer than 10 sick days after 6 months. MI coaching, alongside PME, increased participation in health-promoting activities and smoking cessation among employees in low socioeconomic positions.		

(86) Van Dongen et al. (2013)

Title	A Cost-effectiveness and Return-on-Investment Analysis of a Worksite Vitality Intervention Among Older Hospital Workers		
Country scope	Netherlands		
Industry scope	Health care		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Older hospital employees (45 years or older) from two Dutch academic hospitals: VU University Medical Centre Amsterdam (VUMC) and Leiden University Medical Centre (LUMC). The inclusion criteria were: (1) working at least 16 hours per week and (2) no risk of developing adverse health effects from physical activity.		
	Sample size: 730	Mean age: 52.4	Female ratio: 75.5%
Intervention(s)	Domain: Physical health & fitness		
	Type: Exercise programs, nutrition and weight management		
	The Vital@Work intervention included three components: a 24-week Vitality Exercise Program with weekly group yoga and training sessions, 45 minutes of unsupervised physical activity, and three personal counseling sessions with a Personal Vitality Coach. Additionally, free fruit was provided during the group sessions.		
	Duration: 6 months		
	Setting: In-person		
Comparator	The control group received written information about a healthy lifestyle in terms of physical activity, diet and relaxation (i.e., care as usual).		
Outcome	Outcome measure(s): ROI, net benefit (NB), benefit-cost-ratio (BCR)		
	For NB, BCR, and ROI calculation costs were defined as intervention costs. Meanwhile, benefits were defined as the difference in monetized outcome measures (i.e. absenteeism and presenteeism costs) between the intervention and control groups during follow-up.		
Results	Average NB was € -478 (95% CI, -2663 to 1816) per employee indicating a net loss of €478 for the employer at 12 months follow-up. At 12 months follow-up the benefit cost ratio was -2.21 (i.e., returned money per € invested) and the ROI (i.e. the profit percentage per € invested) was -321%.		

(87) Van Dongen et al. (2017)

Title	The cost-effectiveness and return-on-investment of a combined social and physical environmental intervention in office employees		
Country scope	Netherlands		
Industry scope	Financials		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Office staff from 19 departments of a financial services provider. Participants on sick leave in the last 4 weeks were excluded from participation		
	Sample size: 412	Mean age: 41.28	Female ratio: 39.6%
Intervention(s)	Domain: Working atmosphere, physical health and fitness		
	Type: Work climate change, exercise programs		
	The program addressed both social and physical environments, with three 90-minute group motivational interviewing sessions and a refresher, led by team leaders. It also included four "VIP zones" in the workplace, such as coffee and lounge areas.		
	Duration: 3.5 months		
	Setting: Digital (web/app-based), In-person		
Comparator	Usual practice (no intervention program)		
Outcome	Outcome measure(s): Cost-effectiveness ratio, ROI, net benefit, cost-benefit ratio		
	Primary endpoint the need for recovery. Secondary endpoint general vitality and job satisfaction, ICER (employer and social perspective) and ROI (employer perspective)		
Results	All interventions showed negative employer benefits, NBs -3102 (CI 95%: -5897; -93), BCRs -5.7 (CI 95% -11.7;0.8), and ROIs -666 (CI 95% -1266; -20), with a low likelihood of financial return. For ICER (from employer perspective) the combined intervention (social and physical) was associated with an ICER of €-370, physical only with an ICER of €-763 (cost to employer per point improvement) and social only with an ICER of €4256 (costs to employer per point decline in NFR). With a willingness to pay of €300 per point improvement in NFR, the combined intervention became the preferred option.		

(88) Van Holland et al. (2017)

Title	Effectiveness and Cost-benefit Evaluation of a Comprehensive Workers' Health Surveillance Program for Sustainable Employability of Meat Processing Workers		
Country scope	Netherlands		
Industry scope	Consumer staples		
Study type	RCT		
JB1 evaluation	Risk of bias: High		
PICO framework			
Population	Meat processing workers performing a minimum of 12 hours of paid labor per week.		
	Sample size: 303	Mean age: 50.6	Female ratio: 11.2%
Intervention(s)	Domain: Physical health and fitness		
	Type: Health monitoring programs		
	The POSE program was a comprehensive employee health monitoring initiative involving screening, counseling, and intervention recommendations. Participants completed an online questionnaire assessing physical and mental health, with results guiding personalized intervention recommendations (e.g., GP or dietician visits).		
	Duration: Not specified		
	Setting: Digital (web/app-based), in-person		
Comparator	Regular company healthcare benefits unrelated to the POSE program, as well as all existing programs already running within the company.		
Outcome	Outcome measure(s): ROI, net benefit, cost-benefit ratio (CBR)		
	ROI, net benefit, cost-benefit ratio (CBR), sickness absence >9 days		
Results	The POSE program resulted in a significant cost increase for employers, with average total benefits per participant at €-775 (95% CI: €-1077 to €-440) and a net benefit of €-975 (95% CI: €-1340 to €-691). The cost-benefit ratio was -3.9 (95% CI: -5.7 to -2.5), while the ROI showed a 487% loss (95% CI: -670% to -345%).		

(89) Viester et al. (2014)

Title	The effect of a health promotion intervention for construction workers on work-related outcomes: results from a randomized controlled trial		
Country scope	Netherlands		
Industry scope	Industrials		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Construction workers who participated in a non-compulsory regular health check-up and had not been on sick leave for more than four weeks in the four weeks prior to the check-up.		
	Sample size: 314	Mean age: 46.6	Female ratio: N/A
Intervention(s)	Domain: Physical health and fitness		
	Type: Exercise programs, nutrition and weight management		
	The health promotion program aimed to increase physical activity and improve nutrition. It included lifestyle information, exercise guides, and the "VIP in Construction Toolbox" (health resources, waist tape, pedometer, BMI card, calorie guide, healthy recipes, and a lifestyle quiz).		
	Duration: 6 months		
	Setting: In-person, phone-based		
Comparator	The control group received usual care and was only contacted for the baseline and follow-up measurements.		
Outcome	Outcome measure(s): Sick days		
	Registry data on work-related outcomes (including sick days [dichotomized as no/short-term (≤ 7 days) or long-term (>7 days)]), musculoskeletal symptoms, and physical functionality		
Results	After the intervention, long-term sickness absence was lower in the intervention group at 6 months but slightly higher at 12 months. However, the differences were not statistically significant. After 12 months, the intervention group had an average of 8.5 sick days (SD: 20.6) compared to 7.5 days in the control group (SD: 16.9). Although the baseline sick days were lower in the control group, the intervention group showed a higher reduction in sick days.		

(90) Von Thiele Schwarz et al. (2012)

Title	Effects of Worksite Health Interventions Involving Reduced Work Hours and Physical Exercise on Sickness Absence Costs		
Country scope	Sweden		
Industry scope	Health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	The study included employees from six public dental health workplaces, selected to have at least 25 employees, being profitable, and receiving consent from management and employees.		
	Sample size: 1,311	Mean age: 45.2	Female ratio: 90.7%
Intervention(s)	Domain: Physical health and fitness, working atmosphere		
	Type: Exercise programs, others		
	The physical exercise (PE) condition required employees to engage in 2.5 hours of medium to high intensity exercise each week, with sessions scheduled on two separate days. The type and duration of each session were tracked and monitored by designated coworkers. In the reduced working hours (RWH) condition, employees worked 37.5 hours per week instead of the usual 40, without mandatory exercise. Part-time workers had a proportional reduction in hours.		
	Duration: 12 months		
	Setting: In-person		
Comparator	Employees at workplaces that have not undergone either of the two interventions (PE or RWH) and continued to work 40 hours a week.		
Outcome	Outcome measure(s): Sick days		
	Primary: Costs of sick days Secondary: Registry data on sick days (12 months), prolonged illness, organizational procedures, and productivity		
Results	Sick days decreased in all groups, with the largest reduction in the reference group (-15.9%), followed by the PE group (-11.4%) and the RWH group (-4.9%). The PE group also saw a significant cost reduction (-22.2%), while the reference group experienced a cost increase (+10.2%). The PE intervention proved cost-effective, reducing both direct and indirect costs.		

(91) Vonderlin et al. (2023)

Title	Improving Health and Reducing Absence Days at Work: Effects of a Mindfulness- and Skill-Based Leadership Intervention on Supervisor and Employee Sick Days		
Country scope	Germany		
Industry scope	Health care		
Study type	Quasi-Experiment		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Managers and their employees from 12 participating companies.		
	Sample size: 1,830	Mean age: 43.5	Female ratio: 78%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Health monitoring programs, mindfulness and relaxation		
	The three-day mindfulness and skills-based leadership program (MBP) aims to promote health-related mindfulness and behavior among managers. It included three full-day courses and two three-hour refresher sessions on self-care, employee care, and handling stressed employees, led by experienced health coaches and psychologists with preventive health intervention experience.		
	Duration: 6 months		
	Setting: In-person		
Comparator	No intervention.		
Outcome	Outcome measure(s): Sick days		
	Registry data on sick days (24 months)		
Results	Managers in the MBP group had significantly fewer non-specific sick days than the control group in the two years following the intervention. On average, managers in the intervention group had 13.9 sick days (adjusted mean), while those in the control group had 32.9 sick days (adjusted mean, $\chi^2[1] = 4.38$, $p = 0.036$, $d = 0.47$), with the effect primarily driven by an increase in sick days in the control group. At the employee level, no significant differences were found between the experimental and control groups.		

(92) Wijnen et al. (2019)

Title	Implementing interventions to reduce work-related stress among health-care workers: an investment appraisal from the employer’s perspective		
Country scope	Netherlands		
Industry scope	Health care		
Study type	Cohort study		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Healthcare workers, mainly carers.		
	Sample size: 303	Mean age: 44.45	Female ratio: 96.4%
Intervention(s)	Domain: Mental health and stress		
	Type: Mindfulness and relaxation, mental health policies		
	Stress-Prevention@Work is a digital platform helping healthcare teams assess stress needs, select interventions like communication guidelines, and evaluate their effectiveness, focusing on both organizational and individual solutions.		
	Duration: 12 months		
	Setting: Digital (web/app-based)		
Comparator	Waiting list control group receiving access to the intervention after 12 months.		
Outcome	Outcome measure(s): ROI, net benefit, cost-benefit analysis		
	Self-reported data on ROI, net benefit, and productivity losses (12 months, including absence days)		
Results	The Stress-Prevention@Work intervention showed a net benefit of €2981 per employee per year, with an ROI of 59.6 from a €50 investment. There was a 96.7% chance of cost recovery within a year and an 88.2% likelihood of achieving €1000 in net benefit. The positive ROI was driven by low costs, reduced productivity losses, and early impact.		

(93) Zetterberg et al. (2022)

Title	Preventing Pain and Stress-Related Ill-Health in Employees: A 6-Months Follow-Up of a Psychosocial Program in a Cluster Randomized Controlled Trial		
Country scope	Sweden		
Industry scope	Health care, industrials and consumer services		
Study type	RCT		
JB1 evaluation	Risk of bias: Low		
PICO framework			
Population	Employees who reported pain and/or stress-related illnesses, with the majority of participants being women working in public organizations such as healthcare, schools, and administrative departments.		
	Sample size: 147	Mean age: 43.3	Female ratio: 94.6%
Intervention(s)	Domain: Physical health and fitness, mental health and stress		
	Type: Health monitoring programs, mental health initiatives/training		
	The "Effective Communication within the Organization" (ECO) program aimed to address workplace pain and stress. It included 2-3 hybrid group sessions (live or online) led by psychologists, featuring skill training, case studies, role-playing, assignments, and reflection.		
	Duration: 6 months		
	Setting: In-person, digital (web/app-based)		
Comparator	The control group received a psychoeducational intervention consisting of two one-hour lectures on risk factors and self-management of pain and/or stress-related illnesses, along with information brochures on pain and stress.		
Outcome	Outcome measure(s): Sick days		
	Primary: Registry data on sick days (6 months) Secondary: Self-reported health and well-being		
Results	There was no statistically significant difference in the number of sick days between the intervention group (ECO) and the control group (PE) during the follow-up period. The intervention group reported 8.93 sick days (SD = 27.2), while the control group reported 9.42 sick days (SD = 34.86) during the 6-month follow-up. Self-reported sick days in the last year also did not differ between the two groups after 6 months.		

Table S5. Summary statistics of papers included in the review (n = 68)

Statistics on study design							
RCT ratio [#/% of studies]	36 (52.9%)	Total sample size [across incl. papers]	~144k	Mean age [in years]	40.26	Avg. female ratio [in %]	45.52
Statistics on occupational health interventions							
Country scope [#/% of studies]		Industry scope [#/% of studies]		Delivery format [#/% of studies]		Target level [#/% of studies]	
Netherlands	18 (26.5%)	Health care	21 (30.9%)	In-person only	30 (44.1%)	Individual level	63 (92.6%)
USA	15 (22.1%)	Industrials	15 (22.1%)	Phone only	2 (2.9%)	Leadership	13 (19.1%)
Germany	6 (8.8%)	Consumer services	9 (13.2%)	Digital only	6 (8.8%)	Organizational	9 (13.2%)
Sweden	6 (8.8%)	Financials	5 (7.4%)	In-person/phone	5 (7.4%)	Team	5 (7.4%)
Denmark	5 (7.4%)	Technology	3 (4.4%)	In-person/digital	11 (16.2%)		
Japan	3 (4.4%)	Telecommunication	2 (2.9%)	Phone/digital	1 (1.5%)		
U.K.	3 (4.4%)	Basic materials	1 (1.5%)				
Finland	3 (4.4%)	Consumer staples	1 (1.5%)				
Australia	2 (2.9%)	Not assignable	9 (1.5%)				
Canada	2 (2.9%)	No reference	15 (22.1%)				
Norway	2 (2.9%)						
Turkey	1 (1.5%)						
Switzerland	1 (1.5%)						
No reference	1 (1.5%)						

Table S6. Overview of JBI critical appraisal results

Green: Low risk of bias (0.70 – 1.0); orange = moderate risk of bias (0.50 – 0.70), red = high risk of bias (0 – 0.50)

Authors	Year	Domains for assessment of risk of bias for randomized controlled trials (2023)													JBI rating (-5 & -6)
		1	2	3	4	(5)	(6)	7	8	9	10	11	12	13	
Karlsson et al.	2024	Yes	No	Yes	Yes	No	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Keus van de Poll et al.	2020	Yes	Yes	No	Yes	No	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Duijts et al.	2008	Yes	No	Yes	No	No	Yes	Unclear	Yes	No	No	Yes	Yes	Yes	0.55
Taimela et al.	2009	Yes	Unclear	Yes	No	Unclear	Yes	Unclear	Yes	Yes	No	Yes	Yes	Yes	0.64
Arends et al.	2013	Yes	Yes	Unclear	Yes	No	Unclear	Unclear	Yes	Yes	No	Yes	Yes	Yes	0.73
Keus van de Poll et al.	2020	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	Yes	Unclear	Yes	Yes	0.82
Stansfeld et al.	2015	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	Yes	Unclear	Yes	Yes	0.82
Framke et al.	2016	Yes	Yes	Yes	Unclear	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Klasen et al. (RCT 2)	2021	Yes	Unclear	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Van Holland et al.	2017	Yes	Unclear	No	No	Unclear	Unclear	Unclear	Yes	Yes	No	Unclear	Yes	Unclear	0.36
Krampen	2010	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Unclear	No	Yes	0.45
Tveito and Eriksen	2008	Yes	Yes	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	No	Unclear	No	Yes	0.55
De Boer et al.	2004	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Hengel et al.	2013	Yes	Yes	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	No	Yes	Yes	Yes	0.73
Zetterberg et al.	2022	Yes	Yes	No	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Milani et al.	2009	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Unclear	No	Yes	0.55
Hengel et al.	2014	Yes	Yes	No	No	No	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Viestier et al.	2014	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Taimela et al.	2007	Yes	Unclear	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Ebert et al.	2018	Yes	Yes	Yes	Unclear	No	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Lerner et al.	2020	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Song et al.	2021	Yes	Unclear	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Robroek et al.	2012	Yes	Yes	No	Yes	Unclear	No	Unclear	Yes	No	No	Unclear	No	Yes	0.45
Meenan et al.	2010	Yes	Unclear	Unclear	No	Unclear	Unclear	Unclear	Yes	No	Yes	Unclear	No	Yes	0.36
Freund et al.	2024	Yes	Yes	Yes	No	N/A	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Geraedts et al.	2015	Yes	Yes	Unclear	No	No	Unclear	Unclear	Yes	Yes	No	Yes	Yes	Yes	0.64
Noben et al.	2015	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Brox & Frøystein	2005	Yes	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	No	Yes	No	Yes	0.64
Blangsted et al.	2008	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Yes	No	No	Yes	No	Yes	0.55
Jorgensen et al.	2011	Yes	Yes	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Herman et al.	2008	Yes	No	No	Unclear	No	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.64
Van Dongen et al.	2013	Yes	Yes	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82
Thiart et al.	2016	Yes	Yes	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.82

Authors	Year	Domains for assessment of risk of bias for randomized controlled trials (2023)													JBI rating (-5 & -6)
		1	2	3	4	(5)	(6)	7	8	9	10	11	12	13	
Van Dongen et al.	2017	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	0.73
Groeneveld et al.	2011	Yes	Yes	Yes	No	No	Unclear	Yes	Yes	No	Yes	Yes	Yes	Yes	0.82
Proper et al.	2004	Yes	Yes	Yes	Unclear	No	Unclear	Unclear	Yes	Yes	Yes	Unclear	Yes	Yes	0.73

		Domains for assessment of risk of bias for quasi-experimental studies (2024)									JBI Rating (-4)
Authors	Year	1	2	3	(4)	5	6	7	8	9	
Linden et al.	2014	Yes	Yes	Unclear	Unclear	Yes	Yes	Unclear	Unclear	No	0.50
Akerstrom et al.	2021	Yes	Yes	Unclear	Unclear	Yes	Yes	No	Unclear	Yes	0.63
Kobayashi et al.	2008	Yes	Yes	No	Unclear	Yes	Unclear	No	Yes	Yes	0.63
Vonderlin et al.	2023	Yes	Yes	No	Unclear	Yes	Yes	Yes	Yes	Yes	0.88
Blake et al.	2013	Yes	No	N/A	N/A	Yes	N/A	No	N/A	Yes	0.38
Van den Ven et al.	2023	Yes	Yes	Unclear	Unclear	Yes	Unclear	No	No	Yes	0.50
Makrides et al.	2011	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Von Thiele Schwarz et al.	2012	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	No	No	0.75
Rantonen et al.	2018	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	1.00
Hendriksen et al.	2016	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Losina et al.	2017	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Gregson et al.	2023	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Renaud et al.	2008	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	No	0.38
Ornek et al.	2020	Yes	Yes	Yes	Unclear	Yes	No	Yes	Yes	Yes	0.88
Iijima et al.	2013	Yes	No	N/A	N/A	No	N/A	No	N/A	No	0.13
Bondar et al.	2022	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Goetzel et al.	2014	Yes	No	N/A	N/A	Yes	N/A	No	N/A	No	0.25
Hughes et al.	2007	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Unclear	0.38
Baker et al.	2008	Yes	No	N/A	N/A	Yes	N/A	No	N/A	No	0.25
Norwitz et al.	2022	Yes	No	N/A	N/A	Yes	N/A	No	N/A	Yes	0.38
Gubler et al.	2017	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	0.88
Braun et al.	2014	Yes	No	N/A	N/A	Yes	N/A	No	N/A	No	0.25
Larsen et al.	2019	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	1.00
Saleh et al.	2010	Yes	Yes	No	Unclear	Yes	Yes	Yes	Yes	No	0.75
Ikegami et al.	2010	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	Yes	0.50
Ryan et al.	2018	Yes	No	N/A	N/A	Yes	N/A	Yes	N/A	No	0.38
Musich et al.	2015	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	No	Yes	0.88

Authors	Year	Domains for assessment of risk of bias for cohort studies (2024)											JBI Rating
		1	2	3	4	5	6	7	8	9	10	11	
Dement et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	0.91
Kapinos et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	No	No	Yes	0.73
Wijnen et al.	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	0.91
Jenny et al.	2011	Unclear	Unclear	No	Yes	Yes	Unclear	Yes	Yes	No	No	No	0.36

Authors	Year	Domains for economic evaluations (2020)											JBI Rating
		1	2	3	4	5	6	7	8	9	10	11	
Keus van de Poll et al.	2020	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Van Holland et al.	2017	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	0.82
Milani et al.	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	0.82
Hengel et al.	2014	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Dement et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	0.91
Von Thiele Schwarz et al.	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	0.82
Taimela et al.	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	0.91
Kapinos et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	0.91
Ebert et al.	2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00
Wijnen et al.	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00
Iijima et al.	2013	Yes	No	Yes	No	No	Yes	Yes	Yes	No	Yes	No	0.55
Elson et al.	2019	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	0.64
Bondar et al.	2022	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	0.64
Goetzel et al.	2014	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	0.64
Lerner et al.	2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	0.91
Baker et al.	2008	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	0.73
Meenan et al.	2010	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	0.73
Norwitz et al.	2022	Yes	No	No	Yes	No	Yes	Yes	No	No	Yes	No	0.45
Gubler et al.	2017	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	0.73
Braun et al.	2014	Yes	No	No	No	No	No	No	No	No	No	No	0.09
Saleh et al.	2010	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	0.73
Ryan et al.	2018	Yes	No	Yes	No	Yes	Yes	No	No	No	Yes	No	0.45
Freund et al.	2024	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00
Geraedts et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00

Authors	Year	Domains for economic evaluations (2020)											JBI Rating
		1	2	3	4	5	6	7	8	9	10	11	
Noben et al.	2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	0.91
Herman et al.	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	0.91
Van Dongen et al.	2013	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.91
Thiart et al.	2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00
Van Dongen et al.	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	0.91
Groeneveld et al.	2011	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	0.82
Proper et al.	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1.00
Musich et al.	2015	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	0.64
Jenny et al.	2011	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	0.64

Table S7. Leave-one-out analysis for low risk-of-bias studies (JBI > 0.7)

Omitted study	MD sick days	95% CI	p-value	I ²
Stansfeld et al. (2015)	-0.72	[-3.58, 2.13]	0.62	0%
Framke et al. (2016)	-0.18	[-2.80, 2.43]	0.89	0%
Klasen et al. (2021)	0.01	[-2.54, 2.56]	0.99	0%
De Boer et al. (2004)	-0.18	[-2.80, 2.43]	0.89	0%
Zetterberg et al. (2022)	-0.26	[-3.04, 2.52]	0.85	0%
Vonderlin et al. – Supervisor (2023)	0.24	[-1.40, 1.88]	0.77	0%
Vonderlin et al. – Employee (2023)	-0.46	[-1.44, 0.51]	0.76	0%
Hengel et al. (2014)	-0.18	[-2.80, 2.43]	0.89	0%
Viester et al. (2014)	-0.43	[-3.39, 2.51]	0.77	0%
Rantonen et al. – Rehab (2018)	-0.19	[-2.99, 2.60]	0.89	0%
Rantonen et al. – Physio (2018)	-0.24	[-3.03, 2.55]	0.86	0%
Rantonen et al. – Advice (2018)	-0.28	[-2.99, 2.43]	0.84	0%
Larsen et al. (2019)	-0.15	[-3.58, 3.08]	0.89	0%
Random-effects model (all studies)	-0.18	[-2.80, 2.43]	0.89	0%

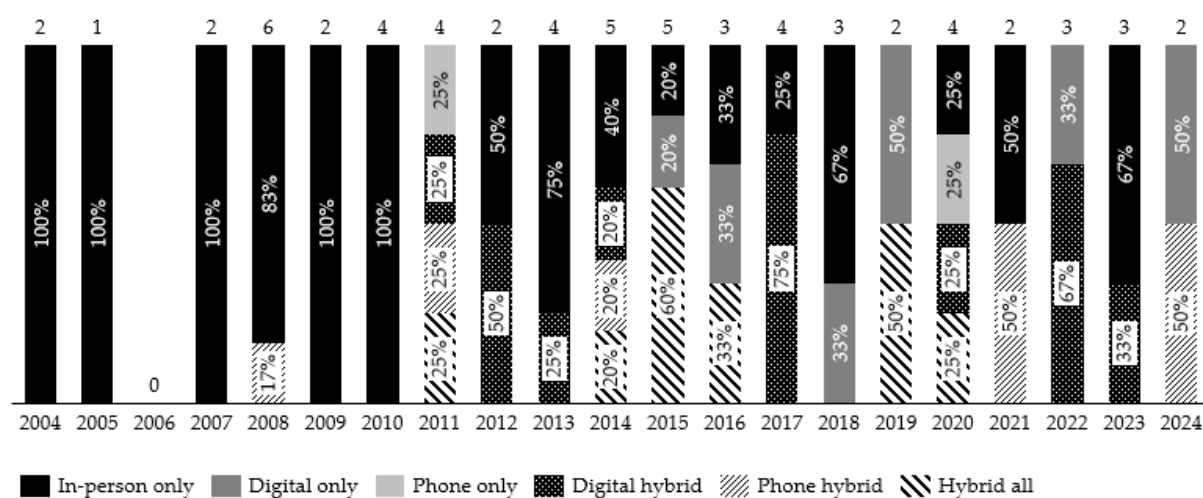
Omitted study	ROI	95% CI	p-value	I ²
Keus van de Poll et al. (2020)	1.92	[-0.34, 4.17]	0.096	33.4%
Hengel et al. (2014)	1.20	[-0.82, 3.22]	0.244	90.2%
Dement et al. (2015)	1.92	[-0.34, 4.17]	0.096	33.4%
Ebert et al. (2018)	2.74	[-0.50, 5.97]	0.097	32.6%
Wijnen et al. (2019)	1.82	[-0.39, 4.03]	0.095	33.8%
Lerner et al. (2020)	1.97	[-0.33, 4.27]	0.095	33.4%
Gubler et al. (2017)	1.92	[-0.34, 4.17]	0.095	33.4%
Freund et al. (2024)	2.38	[-0.58, 5.34]	0.115	41.2%
Noben et al. (2015)	1.15	[-0.81, 3.10]	0.255	0.0%
Van Dongen et al. (2013)	2.12	[-0.29, 4.53]	0.085	49.7%
Thiart et al. (2016)	2.05	[-0.88, 5.29]	0.067	41.6%
Van Dongen et al. – Social (2017)	2.62	[-0.10, 5.34]	0.059	33.3%
Van Dongen et al. – Physical (2017)	1.96	[-0.31, 4.25]	0.092	48.1%
Random-effects model (all studies)	1.92	[-0.34, 4.17]	0.096	33.4%

Figure S1. Search results by intervention type and outcome measure

Figure 1 illustrates the search logic. Numbers that are connected with Boolean logical operators reflect the corresponding search strings in Illustration 1 of the Supplement Material.

	Economics: #1 AND (#2 OR #3 OR #4 OR #5) <i>Hits: 1,795</i>		Sickness absence: #1 AND (#2 OR #3 OR #4 OR #5) <i>Hits: 816</i>	
Intervention type	PubMed	WoS	PubMed	WoS
Mental Health #1 AND #2 AND (#6 OR #7) <i>Hits: 744</i>	#1 AND #2 AND #6 <i>Hits: 197</i>	#1 AND #2 AND #6 <i>Hits: 270</i>	#1 AND #2 AND #7 <i>Hits: 111</i>	#1 AND #2 AND #7 <i>Hits: 166</i>
Physical activity #1 AND #3 AND (#6 OR #7) <i>Hits: 856</i>	#1 AND #3 AND #6 <i>Hits: 267</i>	#1 AND #3 AND #6 <i>Hits: 327</i>	#1 AND #3 AND #7 <i>Hits: 104</i>	#1 AND #3 AND #7 <i>Hits: 158</i>
Nutrition #1 AND #4 AND (#6 OR #7) <i>Hits: 259</i>	#1 AND #4 AND #6 <i>Hits: 72</i>	#1 AND #4 AND #6 <i>Hits: 121</i>	#1 AND #4 AND #7 <i>Hits: 21</i>	#1 AND #4 AND #7 <i>Hits: 45</i>
Working climate #1 AND #5 AND (#6 OR #7) <i>Hits: 752</i>	#1 AND #5 AND #6 <i>Hits: 250</i>	#1 AND #5 AND #6 <i>Hits: 291</i>	#1 AND #5 AND #7 <i>Hits: 80</i>	#1 AND #5 AND #7 <i>Hits: 131</i>

Figure S2. Evolution of OHI delivery formats for studies included in the systematic review



Note: Numbers on top of the bar chart indicate the number of studies included in this systematic review at this point in time.

Figure S3. Overview of study results and risk of bias for selected studies clustered by industry

Study numbers correspond to the reference number and numbering of Table 4 of the Supplement Material, with some studies appearing multiple times as they evaluate various interventions and outcomes. Shading pattern reflects the JBI rating: fully shaded for low (JBI > 0.7), dotted for moderate (0.5–0.7), and striped for high risk of bias (< 0.5). Colors indicate effect direction: black for benefits, dark gray for no effect, and light grey for negative outcomes. Non-significant results are classified as no effect. Stars indicate statistical significance levels reported for outcome variable in respective study. Crosses represent studies without reported significance levels. 1) Return on investment. 2) Cost-benefit analysis. 3) Cost-benefit ratio. 4) Cost-effectiveness ratio. 5) E.g., Reduced work hours

I. Studies conducted in the healthcare sector

Domain	Intervention type	Absence				Employer economics						
		Sick days	Sick days (dichot.)	Absence rate	Others	ROI ¹	Net benefit	CBA ²	Cost savings	CBR ³	CER ⁴	Other
Physical health & fitness	Exercise programs	86 90† 77† 33	85	64† 29** 76 65**		35 86 86			77	86	78†	77
	Nutrition & weight management	33	85	64† 29** 76		35 86 86				86	78†	
	Health monitoring	93 91		29		35					78†	
Mental health & stress	Mindfulness & relaxation	80 84 91 85 77† 33		64†		92* 53† 92* 92*			77			77
	Mental health initiatives	93				70** 70** 70**						
	Policies					92* 92* 92*						
Working atmosphere	Education & training	36** 62										
	Work climate			64† 76		53†						
	Others ⁵	90†										

JBI risk of bias

Low (0.70 - 1.0)

Moderate (0.50 - 0.70)

High (0.0 - 0.50)

Effect on outcome variable

Benefit

No effect

Loss

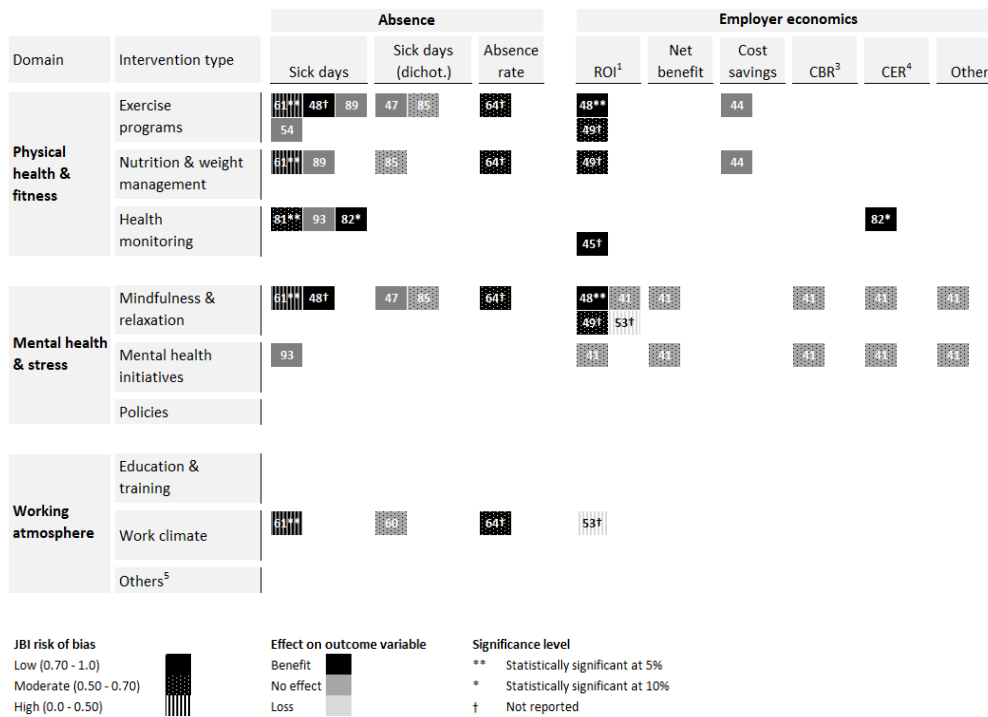
Significance level

** Statistically significant at 5%

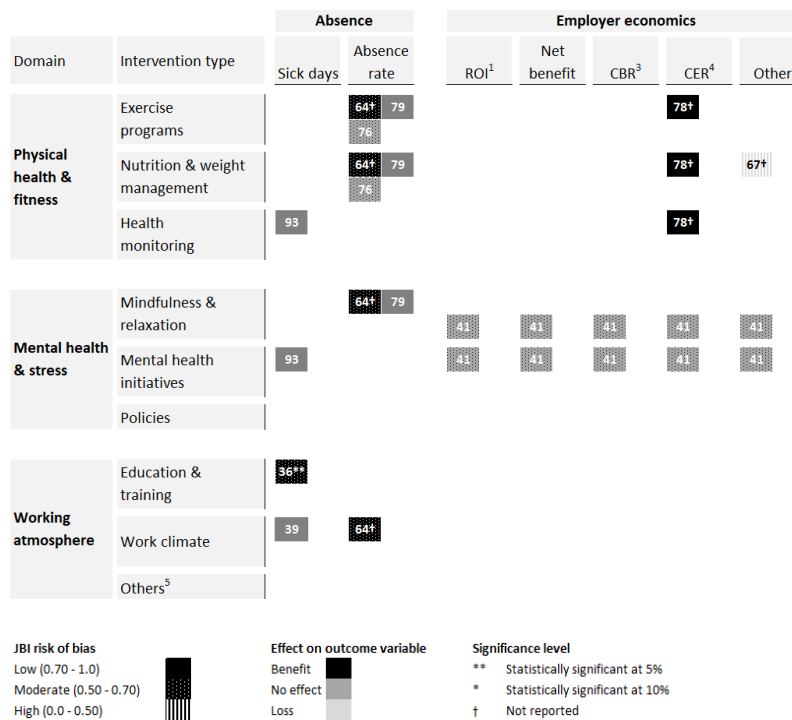
* Statistically significant at 10%

† Not reported

II. Studies conducted in the industrial sector



III. Studies conducted in the consumer service sector



IV. Studies conducted in other sectors.

Financial (= Fi), technology (= Tec), telecommunication (= Tel), basic materials (= Ba), and consumer stables (=CS) have been clustered as other sectors. Industry abbreviations are listed in the respective cells.

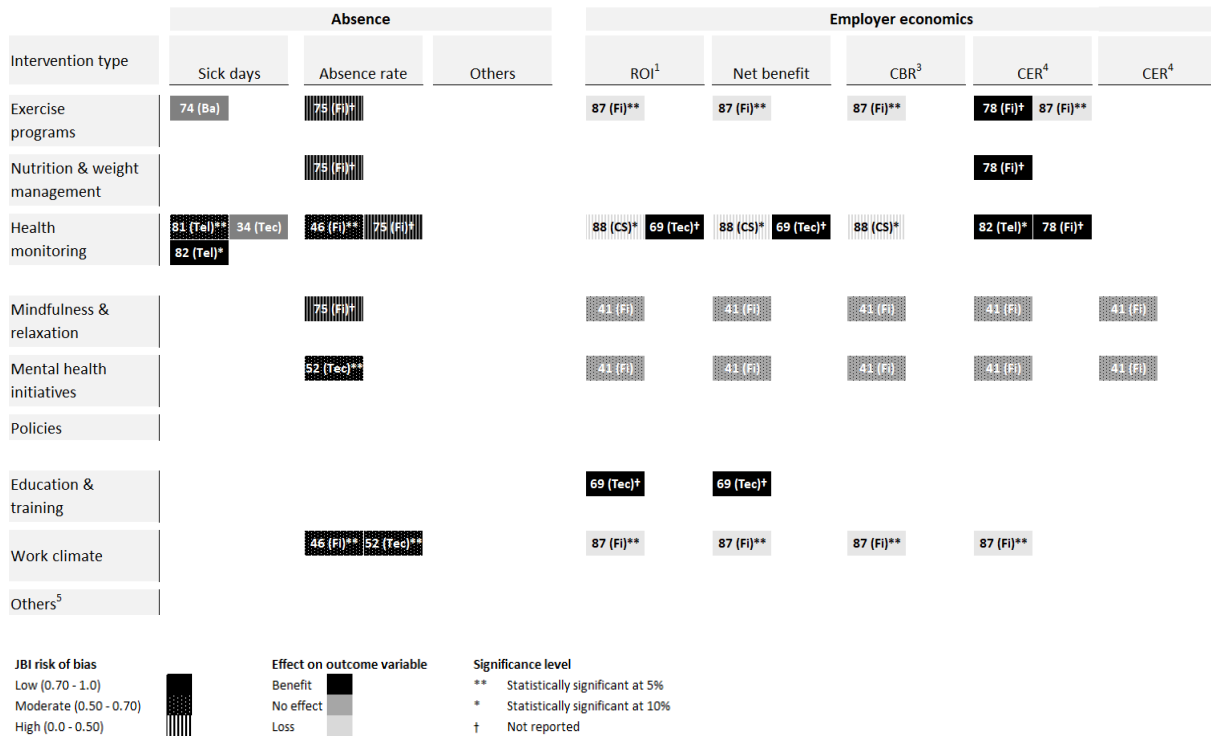
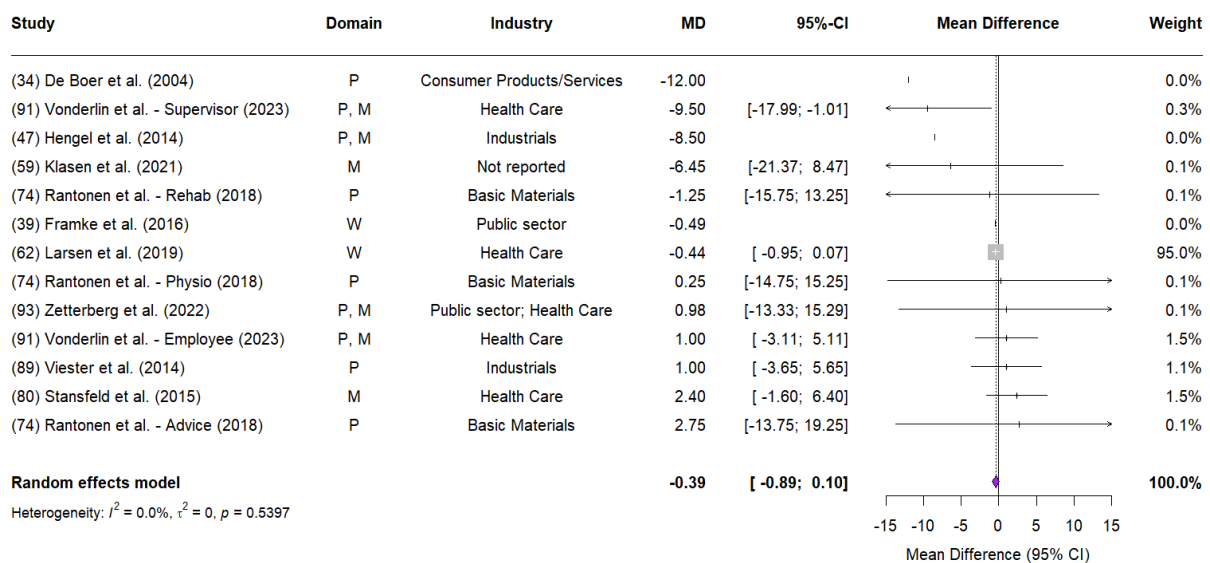


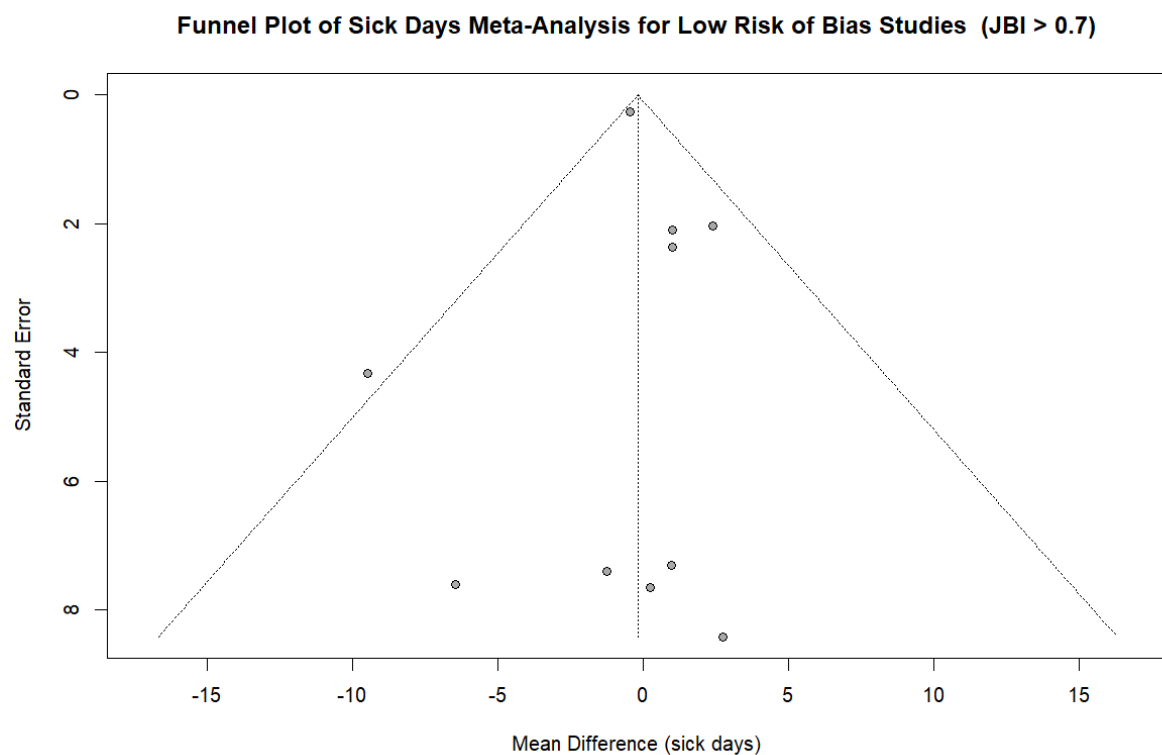
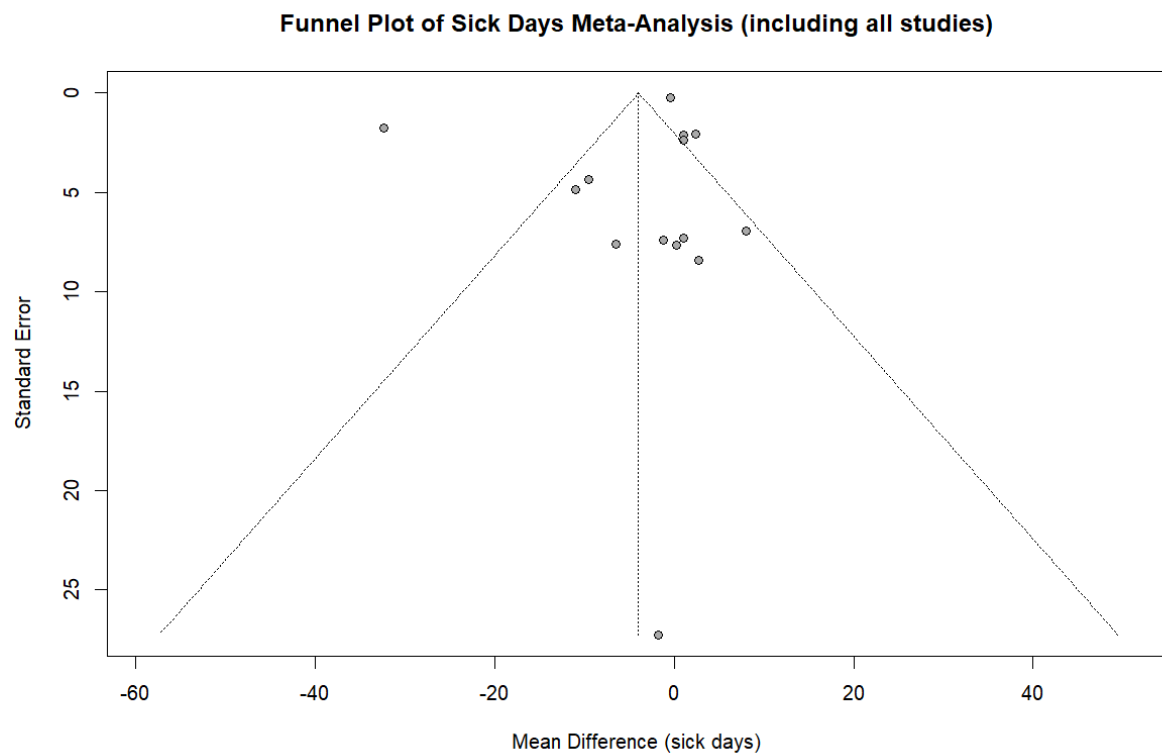
Figure S4. Random-effects model (REML method) for mean differences (MD) in sick days in low risk of bias studies (JB1 > 0.7)



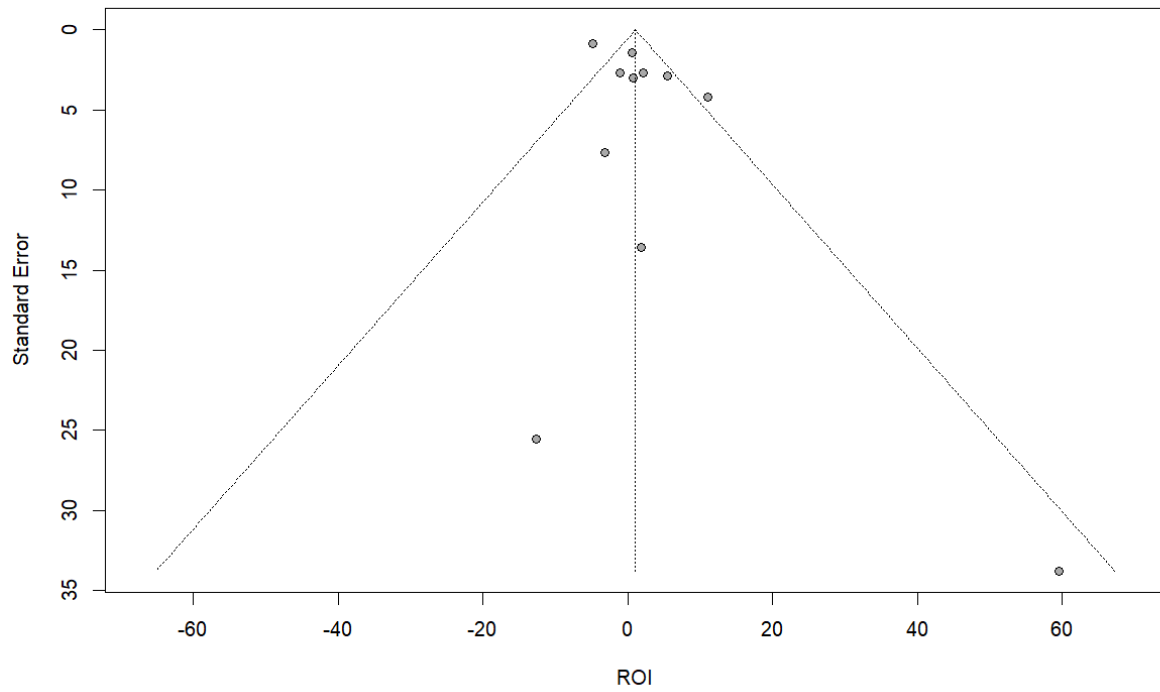
Note: Study numbers correspond to reference number and numbering of Table 4 of the Supplement Material. For the intervention domain, the following abbreviations apply: P = Physical health and fitness; M = Mental health and stress; W = Education and training. Studies that did not report statistical results for the mean difference in sick days were excluded from the random-effects calculation (assigned a weight of 0%) and are displayed for reference purposes only. Some studies report

sick day results for specific sub-groups (e.g., Vonderlin et al. (91), hence they appear multiple times in the forest plot with the respective subgroup designation. The P value at the lower end of the forest diagram refers to the heterogeneity test.

Figure S5. Funnel plots for primary meta-analyses (low-risk studies only) and all studies including in meta analyses irrespective of JBI rating



Funnel Plot of ROI Meta-Analysis (including all studies)



Funnel Plot of ROI Meta-Analysis for Low Risk of Bias Studies (JBI > 0.7)

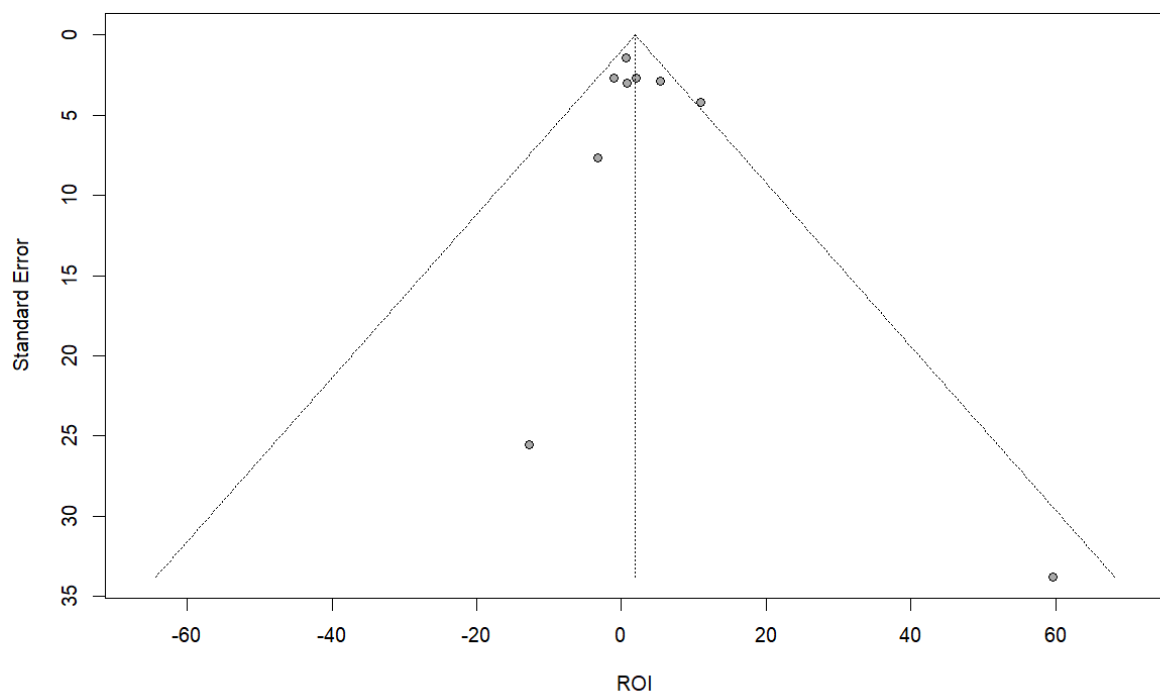
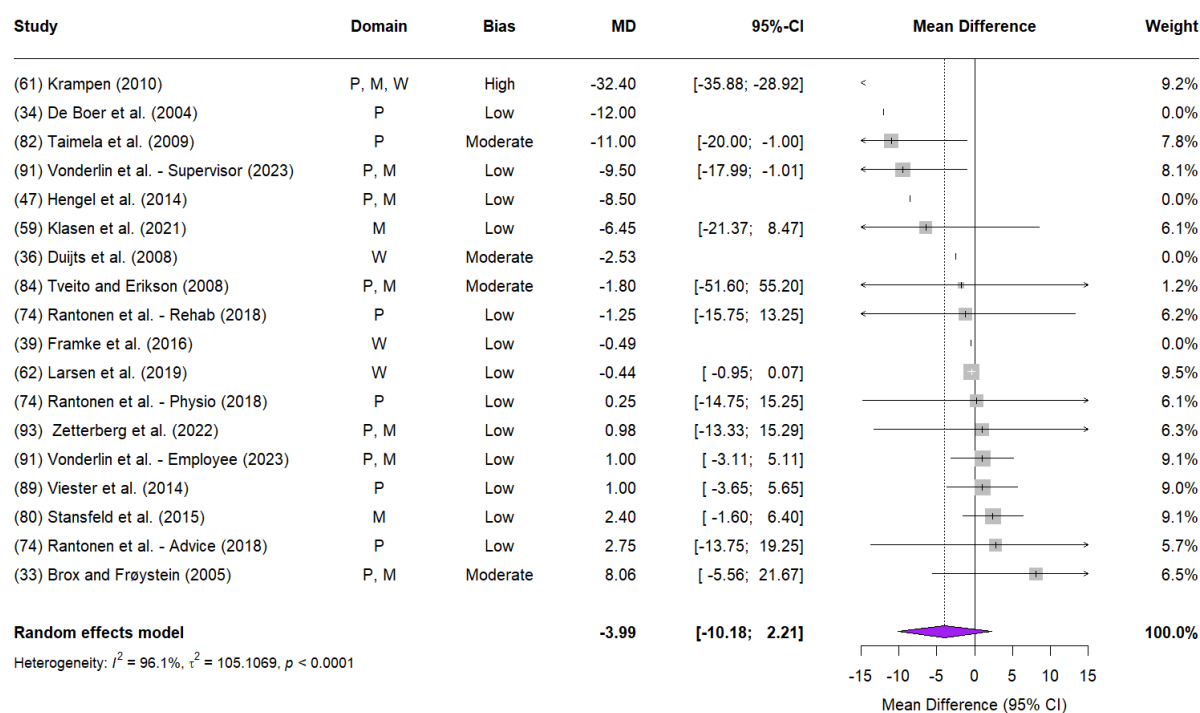


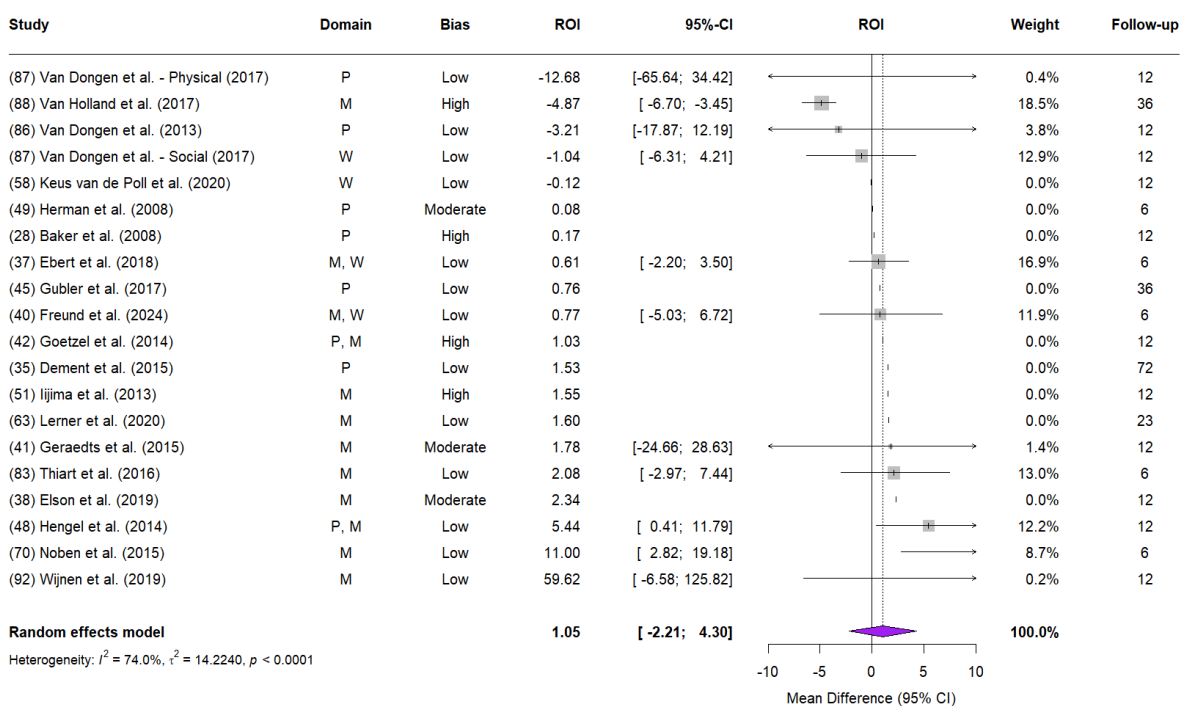
Figure S6. Forest plots of sub-group analyses

Ten subgroup analyses have been conducted to assess the impact of OHIs on sick days and return on investment. The results of these analyses are presented below.

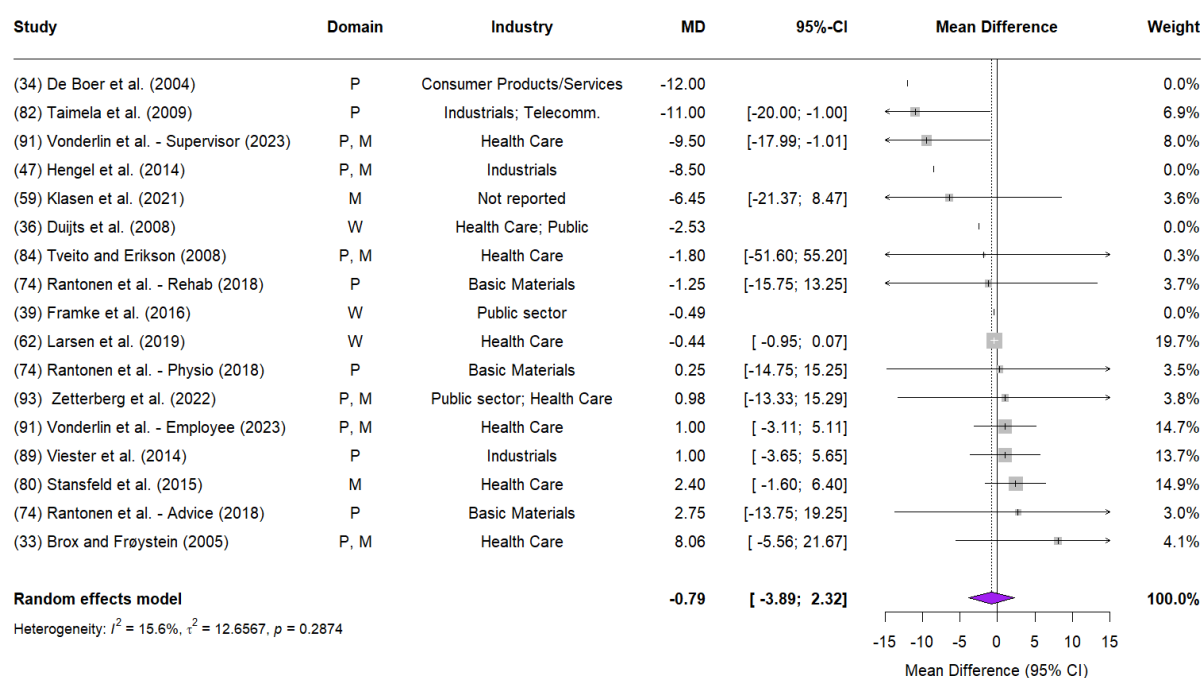
1. Subgroup analysis: All studies (sick days)



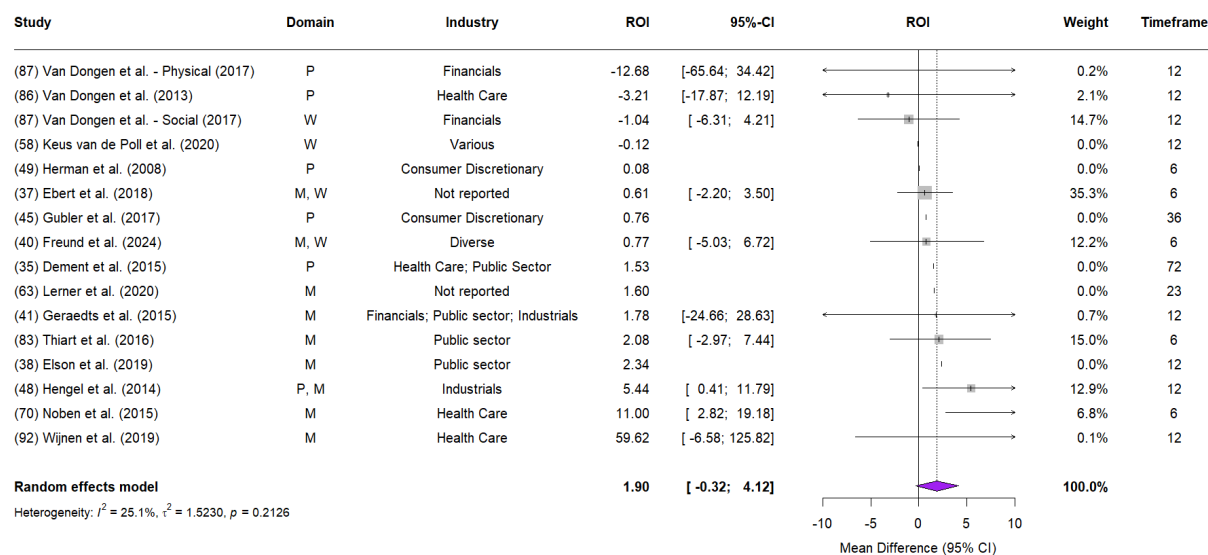
2. Subgroup analysis: All studies (ROI)



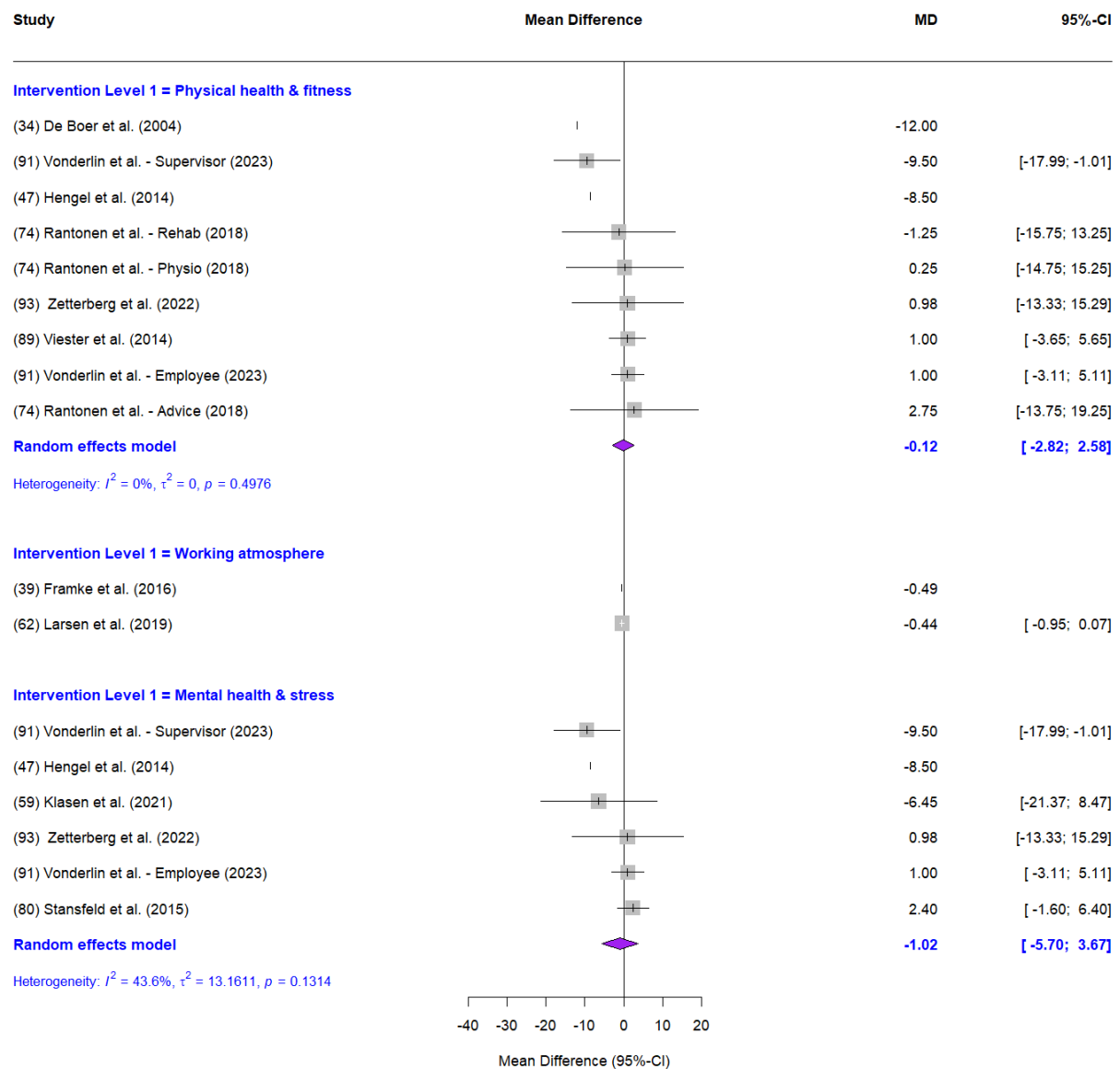
3. Subgroup analysis: Excluding high risk of bias (sick days)



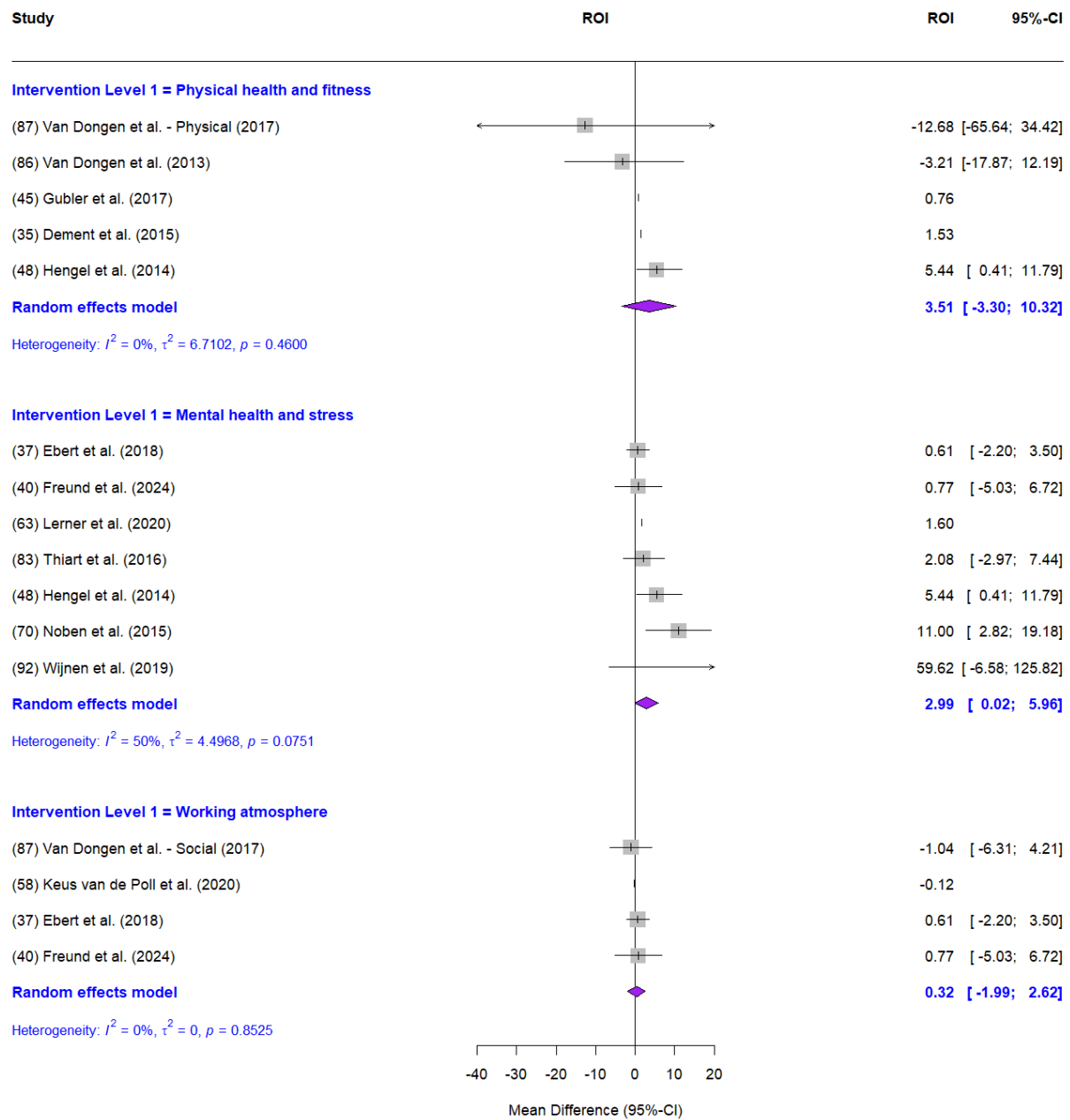
4. Subgroup analysis: Excluding high risk of bias (ROI)



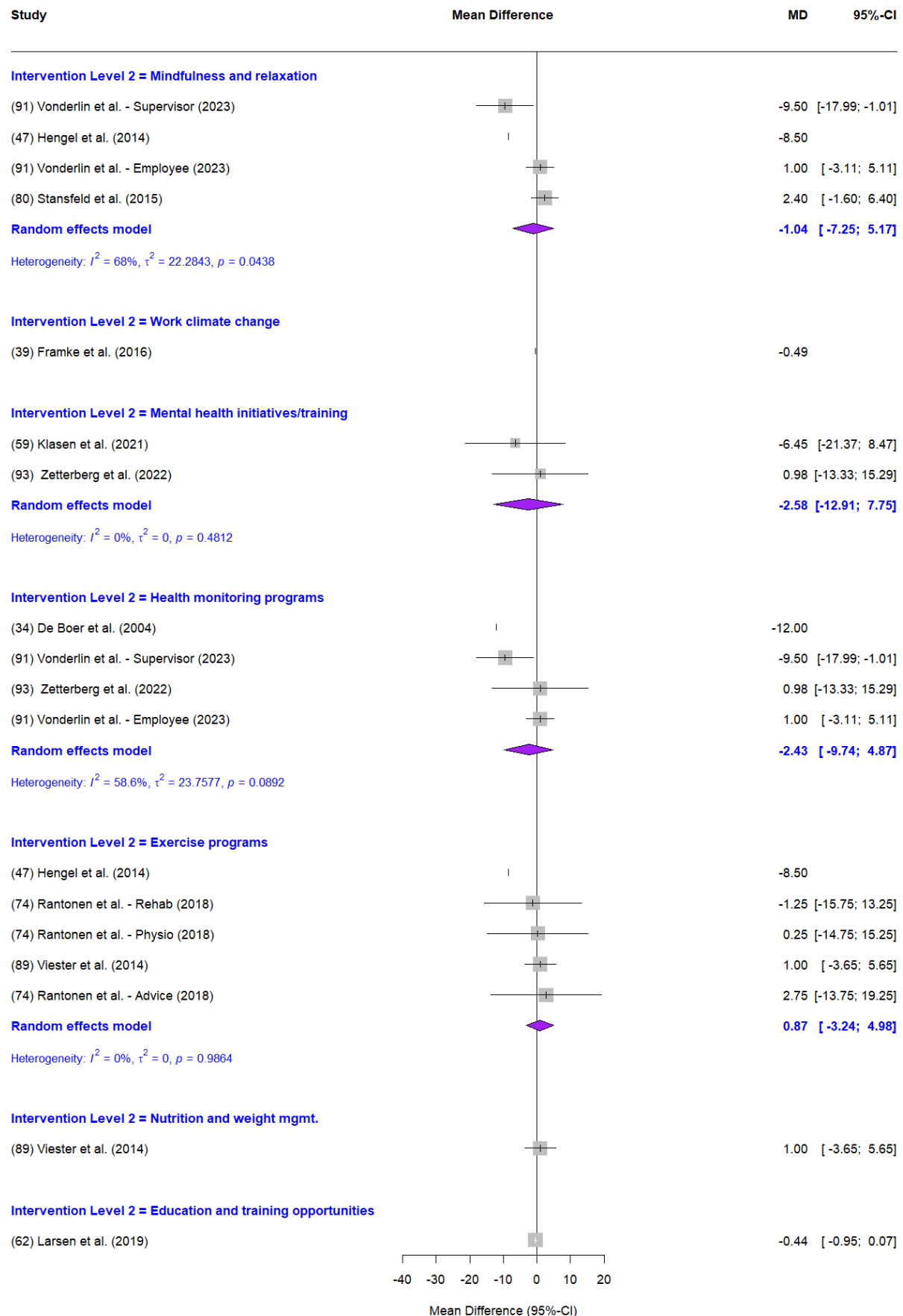
5. Subgroup analysis: Low risk of bias by intervention domain (sick days)



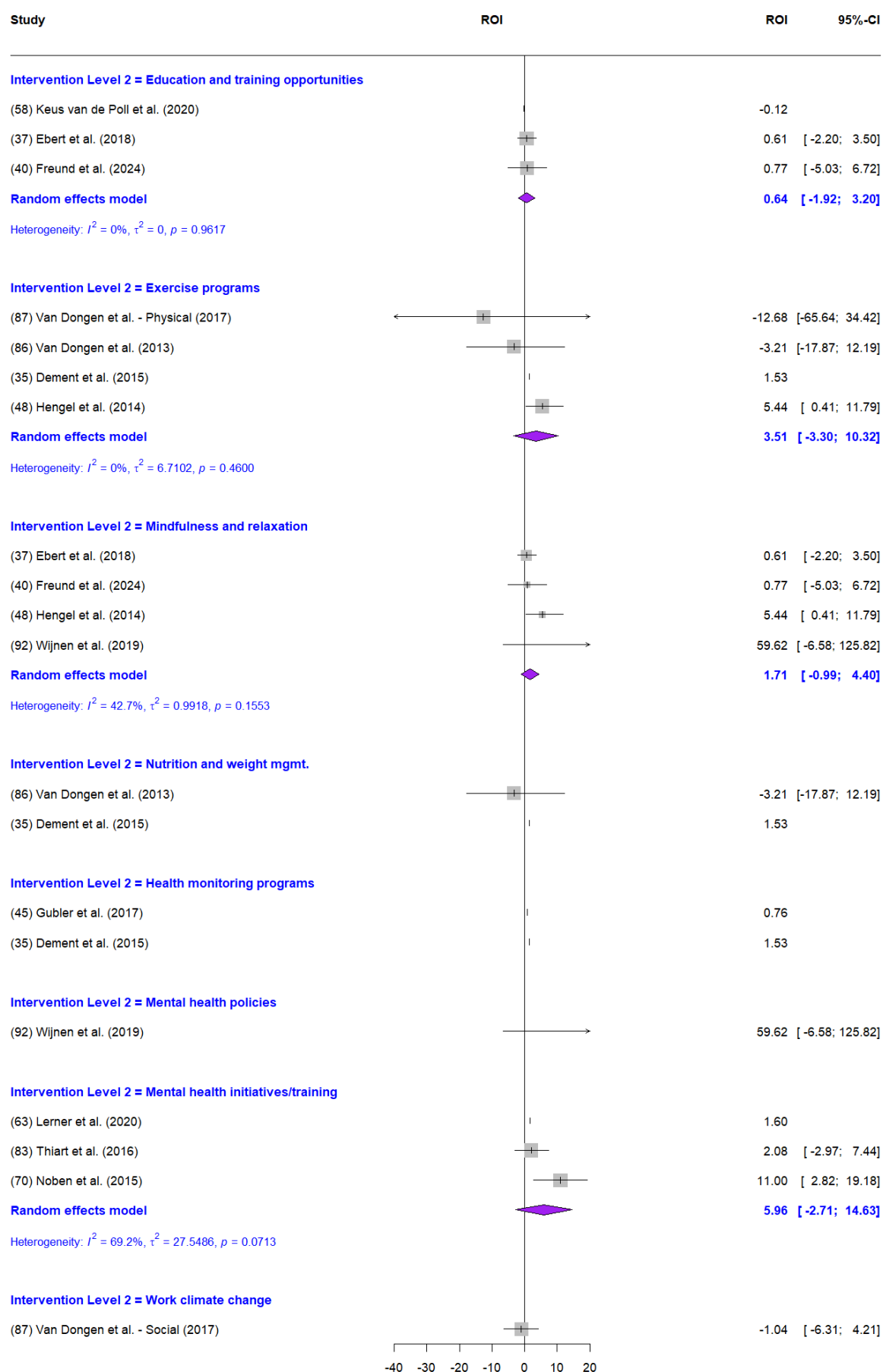
6. Subgroup analysis: Low risk of bias by intervention domain (ROI)



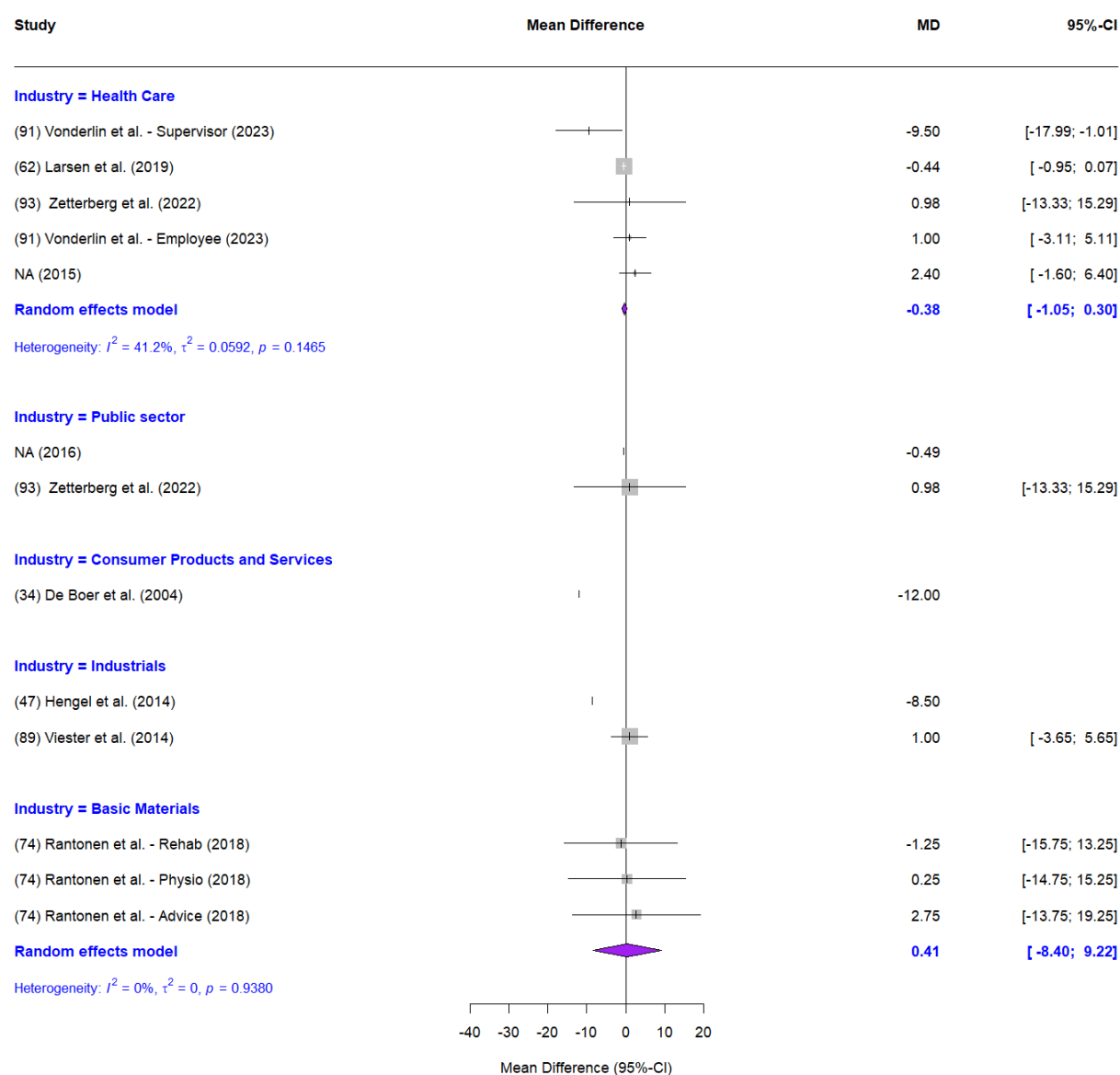
7. Subgroup analysis: Low risk of bias by intervention type (sick days)



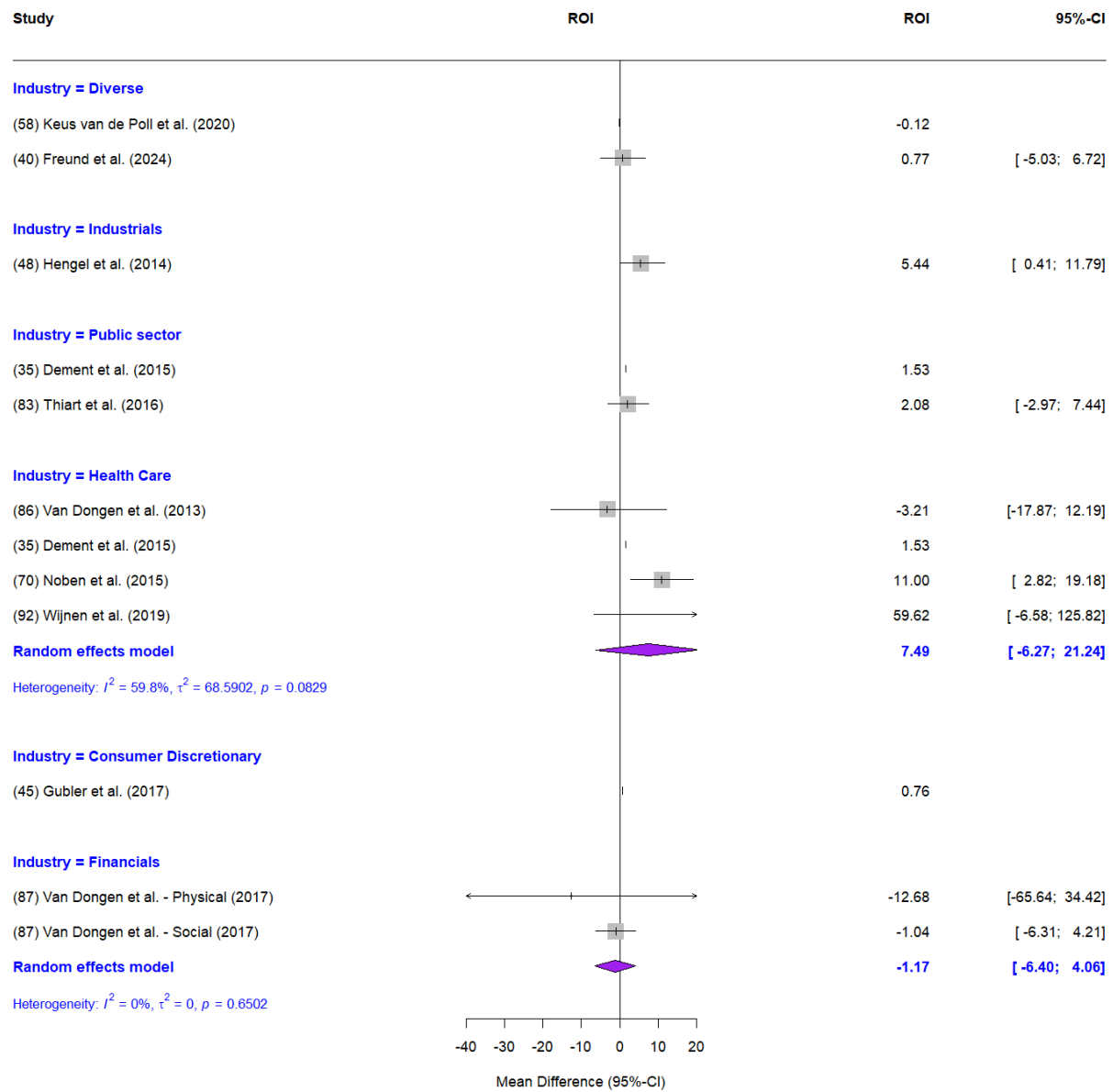
8. Subgroup analysis: Low risk of bias by intervention type (ROI)



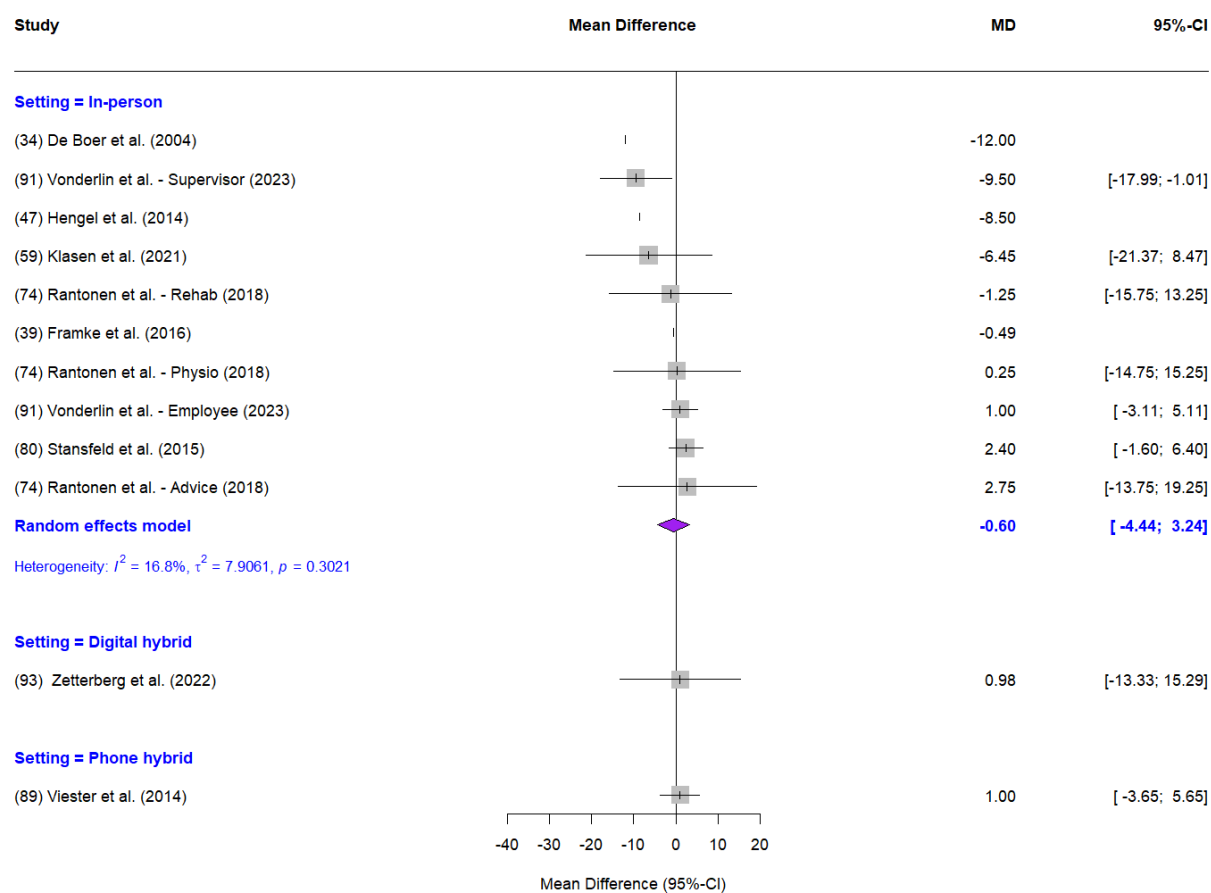
9. Subgroup analysis: Low risk of bias by industry type (sick days)



10. Subgroup analysis: Low risk of bias by industry type (ROI)



11. Subgroup analysis: Low risk of bias by delivery format (sick days)



12. Subgroup analysis: Low risk of bias by delivery format (ROI)

