

## **A meta-analysis of health effects of randomized controlled worksite interventions: Does social stratification matter?**

### **Supplementary materials**

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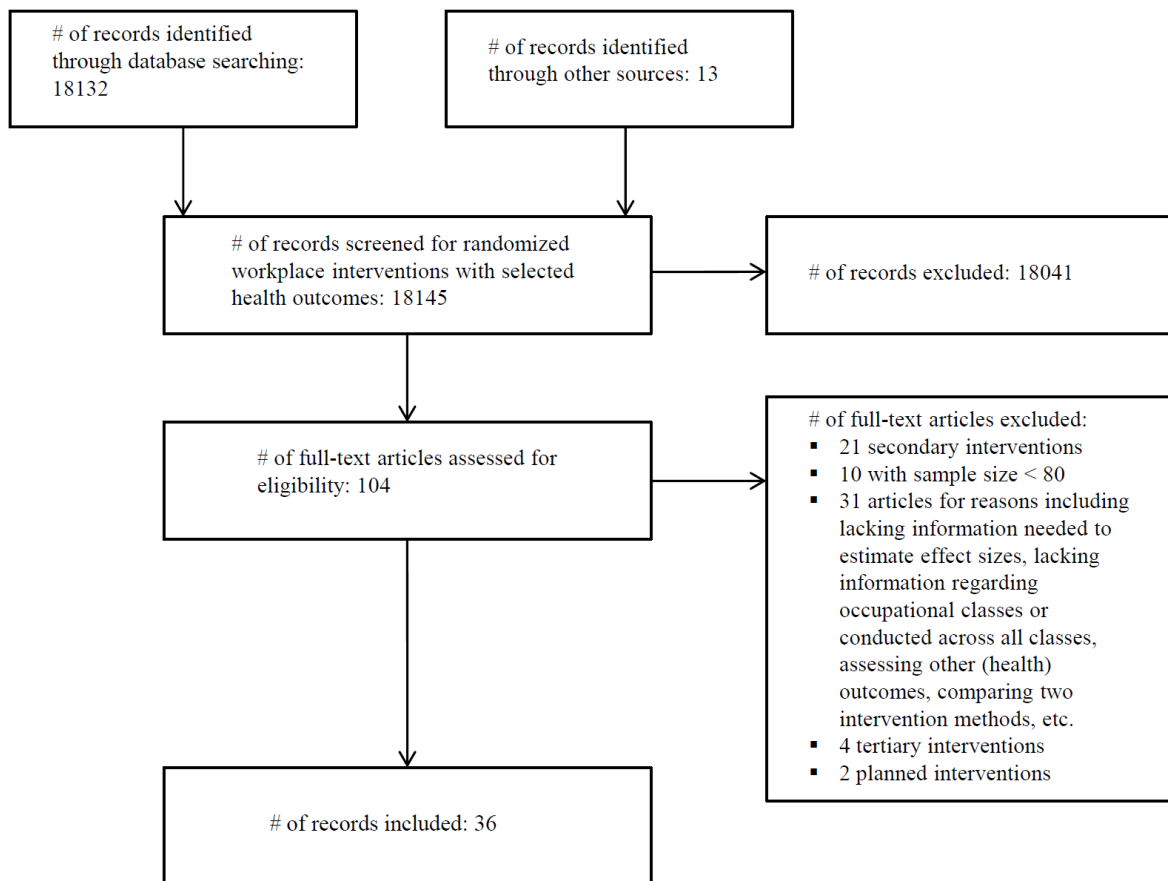
#### ***1. Study protocol***

Studies were identified by screening the following databases: ASSIA: Applied Social Sciences Index and Abstracts (SciVerse), Business Source Premier (EBSCO), Cochrane Central Register of Controlled Trials (CENTRAL), Econlit (EBSCO), PubMed (PMC), Scopus (SciVerse), Social Science Citation Index (Web of Knowledge), Sociological Abstracts (ProQuest), and WISO: Wirtschaftswissenschaften. The search was restricted to original papers in peer-reviewed international journals in English, German, French, and Dutch language, published between January 1980 and December 2012. Therefore, neither conference papers nor government-commissioned reports were considered. The systematic search in databases was amended by search in systematic reviews, meta-analyses, consulting of experts, and search in relevant websites. As a quality checklist for reporting the PRISMA statement (1) and the GRADE approach (2) were utilized. Two authors (DM and HH) judged all records on the basis of titles and abstracts. In ambiguous cases papers were discussed and full texts were consulted. In a second step, all selected papers were independently reviewed by the two authors based on full texts, and again, ambiguous cases were discussed. Data were extracted in a standardized format.

The study selection was guided by the following criteria:

1. Randomized controlled interventions.
2. Interventions conducted on healthy populations.
3. Primary interventions.
4. As health outcomes body mass index, fruit and vegetable consumption, musculoskeletal symptoms, and perceived stress were considered.
5. Overall sample size at baseline should be at least 80 (i.e. approximately 40 in each group).
6. Interventions targeting employees of all EGP occupational classes were excluded in order to enhance the identification of EGP intervention effect modifications.

In Figure 1 we report the PRISMA flow diagram indicating number of identified records, the eligibility criteria and the total number of included studies.



**Figure 1. PRISMA flow diagram.**

## ***2. Search strategy***

In general, the search strategy was defined by the following logical structure

Health outcomes AND Occupational characteristics AND Workplace interventions AND Time (January 1980 – December 2012)

The search queries in the largest databases for the time period indicated were the following:

### **PubMed (PMC)**

((("health" All Fields OR ("subjective" All Fields AND "health" All Fields) OR ("health" All Fields AND ("manpower" All Fields OR "worker\*" All Fields)) OR ("physical" All Fields AND "health" All Fields) OR ("mental" All Fields AND "health" All Fields) OR ("general" All Fields AND "health" All Fields) OR ("functioning" All Fields AND "health" All Fields) OR functioning All Fields OR functional limitations All Fields OR "absenteeism" All Fields OR ("sickness" All Fields AND "absence" All Fields) OR ("depressive" All Fields AND "disorder" All Fields) OR ("affective" All Fields AND "disorder" All Fields) OR depression All Fields OR "disease\*" All Fields OR cardiovascular All Fields OR ("cardiovascular" All Fields AND "disease\*" All Fields) OR ("heart" All Fields AND "disease\*" All Fields) OR coronary All Fields OR "stroke" All Fields OR (ischaemia All Fields OR "ischemia" All Fields OR "ischem\*" All Fields) OR myocard\* All Fields OR "hypertension" All Fields OR "obesity" All Fields OR diabetes All Fields OR "overweight" All Fields OR "cholesterol" All Fields OR musculoskeletal All Fields OR ("musculoskeletal" All Fields AND "disorder" All Fields) OR "blood pressure" All Fields OR ("back" All Fields AND "pain" All Fields) OR "disability" All Fields OR ("wound\*" All Fields AND "injur\*" All Fields) OR "injur\*" All Fields OR "wounds" All Fields OR ("work" All Fields AND ("accidents" All Fields OR "accidents" MeSH Terms)) OR morbidity All Fields OR mortality All Fields OR burnout All Fields OR ("all-cause" All Fields AND "mortality" All Fields))

AND ((("psychosocial" All Fields AND ("stress" All Fields OR "stressors" All Fields OR "risk" All Fields OR "conditions" All Fields)) OR ("psychological" All Fields AND ("stress" All Fields OR "stressors" All Fields)) OR "demand-control" All Fields OR ("support" All Fields AND work All Fields) OR ("demand" All Fields AND "control" All Fields) OR ("effort" All Fields AND "reward" All Fields) OR ("effort-reward" All Fields AND "imbalance" All Fields) OR ("organizational" All Fields AND "justice" All Fields) OR ("organisational" All Fields AND "justice" All Fields) OR ("strain" All Fields AND (work All Fields OR job All Fields)) OR ("job" All Fields AND "task" All Fields AND "control" All Fields) OR ("work\*" All Fields AND "conditions" All Fields) OR "psychosocial" All Fields OR "workplace" All Fields OR "job\*" All Fields OR "downsizing" All Fields OR "overtime" All Fields OR "ergonomic" All Fields OR ((("physical" All Fields OR "chemical" All Fields) AND "hazard\*" All Fields) OR ((("night" All Fields OR "day" All Fields) AND "work" All Fields) OR ("occupation\*" All Fields AND "stress\*" All Fields) OR ("work\*" All Fields AND "characteristics" All Fields))

AND (intervention Title/Abstract)

AND ("management" All Fields OR "organization" All Fields OR "organisation" All Fields OR ("disease" All Fields AND "management" All Fields) OR ("health" All Fields AND "circles" All Fields) OR "amigo" All Fields OR ("primary" All Fields AND "intervention" All Fields) OR "prima-ef" All Fields OR ("health" All Fields AND "management" All Fields) OR ("return to" All Fields AND "work" All Fields) OR ("return-to" All Fields AND "work" All Fields) OR ("workplace" All Fields AND "health" All Fields) OR ("health" All Fields AND "promotion" All Fields) OR ("shift" All Fields AND "work" All Fields) OR ("psychosocial" All Fields AND "risk" All Fields) OR "risk management" All Fields OR "self-scheduling" All Fields OR ("flexible" All Fields AND "scheduling" All Fields) OR ("work" All Fields AND "schedule\*" All Fields) OR ("flexible" All Fields AND "work" All Fields) OR ("compressed" All Fields AND ("hour" All Fields OR "work" All Fields)) OR ("compressed" All Fields AND "week" All Fields) OR ("flexible" All Fields AND "salary" All Fields) OR ("life" All Fields AND "balance" All Fields) OR ("work" All Fields AND "life" All Fields AND "balance" All Fields) OR ("life" All Fields AND "family" All Fields) OR ("reconciling" All Fields AND "work" All Fields) OR "employee\*" All Fields OR "employer\*" All Fields OR ("quality" All Fields AND "life" All Fields) OR "quality of life" All Fields OR (("cognitive" All Fields AND "therapy" All Fields) AND "behavi\*" All Fields)))

### **Scopus (SciVerse)**

(TITLE-ABS-KEY(health AND (subjective OR mental OR physical OR general)) OR TITLE-ABS-KEY(manpower) OR TITLE-ABS-KEY(worker) OR TITLE-ABS-KEY(functioning AND health) OR TITLE-ABS-KEY(functioning) OR TITLE-ABS-KEY(functional AND limitations) OR TITLE-ABS-KEY(absenteeism) OR TITLE-ABS-KEY(sickness AND absence) OR TITLE-ABS-KEY(depressive AND disorder) OR TITLE-ABS-KEY(affective AND disorder) OR TITLE-ABS-KEY(depression) OR TITLE-ABS-KEY(disease) OR TITLE-ABS-KEY(cardiovascular AND disease\*) OR TITLE-ABS-KEY(heart AND disease) OR TITLE-ABS-KEY(coronary) OR TITLE-ABS-KEY(stroke) OR TITLE-ABS-KEY(ischem\*) OR TITLE-ABS-KEY(ischaemia) OR TITLE-ABS-KEY(myocard\*) OR TITLE-ABS-KEY(hypertension) OR TITLE-ABS-KEY(obesity) OR TITLE-ABS-KEY(diabetes) OR TITLE-ABS-KEY(overweight) OR TITLE-ABS-KEY(cholesterol) OR TITLE-ABS-KEY(musculoskeletal AND disorder) OR TITLE-ABS-KEY(blood AND pressure) OR TITLE-ABS-KEY(back AND pain) OR TITLE-ABS-KEY(disability) OR TITLE-ABS-KEY(wound) OR TITLE-ABS-KEY(injur\*) OR TITLE-ABS-KEY(work AND accidents) OR TITLE-ABS-KEY(accidents) OR TITLE-ABS-KEY(morbidity) OR TITLE-ABS-KEY(mortality) OR TITLE-ABS-KEY(burnout) OR TITLE-ABS-KEY(all-cause AND mortality))

AND (TITLE-ABS-KEY(psychosocial AND (stress OR stressors OR conditions OR risk)) OR TITLE-ABS-KEY(psychological AND (stress OR stressors)) OR TITLE-ABS-KEY(demand-control) OR TITLE-ABS-KEY(support AND work) OR TITLE-ABS-KEY(work AND control) OR TITLE-ABS-KEY(effort AND reward) OR TITLE-ABS-KEY(effort-reward AND imbalance) OR TITLE-ABS-KEY(organizational AND justice) OR

TITLE-ABS-KEY(organisational AND justice) OR TITLE-ABS-KEY(strain AND (work AND job)) OR TITLE-ABS-KEY(work\* AND conditions) OR TITLE-ABS-KEY(psychosocial) OR TITLE-ABS-KEY(workplace) OR TITLE-ABS-KEY(job\*) OR TITLE-ABS-KEY(downsizing) OR TITLE-ABS-KEY(overtime) OR TITLE-ABS-KEY(ergonomic) OR TITLE-ABS-KEY((physical OR chemical) AND hazards) OR TITLE-ABS-KEY((night OR day) AND work) OR TITLE-ABS-KEY(occupation\* AND stress) OR TITLE-ABS-KEY(work\* AND characteristics)) AND (TITLE-ABS-KEY(intervention\*)) AND (TITLE-ABS-KEY(work\*))

AND (TITLE-ABS-KEY(disease AND management) OR TITLE-ABS-KEY(health AND circles) OR TITLE-ABS-KEY(amigo) OR TITLE-ABS-KEY(primary AND intervention) OR TITLE-ABS-KEY(prima-ef) OR TITLE-ABS-KEY(health AND management) OR TITLE-ABS-KEY(workplace AND health) OR TITLE-ABS-KEY(health AND promotion) OR TITLE-ABS-KEY(shift AND work) OR TITLE-ABS-KEY(psychosocial AND risk) OR TITLE-ABS-KEY(risk management) OR TITLE-ABS-KEY(self-scheduling) OR TITLE-ABS-KEY(flexible AND scheduling) OR TITLE-ABS-KEY(work AND schedule\*) OR TITLE-ABS-KEY(reconciling AND work) OR TITLE-ABS-KEY(family AND life) OR TITLE-ABS-KEY(return to AND work) OR TITLE-ABS-KEY(return-to AND work) OR TITLE-ABS-KEY(flexible AND work) OR TITLE-ABS-KEY(flexibility) OR TITLE-ABS-KEY(compressed AND (hour OR work)) OR TITLE-ABS-KEY(compressed AND week) OR TITLE-ABS-KEY(flexible AND salary) OR TITLE-ABS-KEY(life AND balance) OR TITLE-ABS-KEY(work AND life AND balance) OR TITLE-ABS-KEY(employee\*) OR TITLE-ABS-KEY(employer\*) OR TITLE-ABS-KEY(quality AND life) OR TITLE-ABS-KEY(quality of life) OR TITLE-ABS-KEY(cognitive AND (therapy OR behav\*)))

### **ASSIA and Sociological Abstracts (ProQuest)**

(ti,ab((health AND (subjective OR mental OR physical OR general)) OR manpower OR worker OR (functioning AND health) OR functioning OR (functional AND limitations) OR absenteeism OR (sickness AND absence) OR (depressive AND disorder) OR (affective AND disorder) OR depression OR disease OR (cardiovascular AND disease) OR (heart AND disease) OR coronary OR stroke OR ischem OR ischaemia OR myocard OR hypertension OR obesity OR diabetes OR overweight OR cholesterol OR (musculoskeletal AND disorder) OR musculoskeletal OR (blood AND pressure) OR (back AND pain) OR disability OR wound OR injury OR (work AND accidents) OR accidents OR morbidity OR mortality OR burnout OR (all-cause AND mortality)))

AND (ti,ab((psychosocial AND (stress OR stressors OR conditions OR risk)) OR (psychological AND (stress OR stressors)) OR demand-control OR (support AND work) OR (work AND control) OR (effort AND reward) OR (effort-reward AND imbalance) OR (organizational AND justice) OR (organisational AND justice) OR (strain AND (work AND job)) OR (work AND conditions) OR psychosocial OR workplace OR job OR downsizing OR overtime OR ergonomic OR (hazard AND (physical AND chemical)) OR (work AND (night OR day)) OR (occupation AND stress) OR (work AND characteristics)))

AND (ti,ab((disease AND management) OR (health AND circles) OR amigo OR (primary AND intervention) OR prima-ef OR (health AND management) OR (workplace AND health) OR (health AND promotion) OR (shift AND work) OR risk management OR self-scheduling OR (flexible AND scheduling) OR (work AND schedule) OR (reconciling AND work) OR (family AND life) OR (return-to AND work) OR (flexible AND work) OR flexibility OR (compressed AND (hour OR work OR week)) OR (flexible AND salary) OR (life AND balance) OR (work AND (life OR balance)) OR employee OR employer OR (quality AND life) OR (cognitive AND (therapy OR behavi\*))))

AND (ti,ab(intervention\*))

### **Business Source Premier and Econlit (EBSCO)**

(TX (health AND (subjective OR mental OR physical OR general)) OR manpower OR worker OR (functioning AND health) OR functioning OR (functional AND limitations) OR absenteeism OR (sickness AND absence) OR (depressive AND disorder) OR (affective AND disorder) OR depression OR disease OR (cardiovascular AND disease) OR (heart AND disease) OR coronary OR stroke OR ischem OR ischaemia OR myocard OR hypertension OR obesity OR diabetes OR overweight OR cholesterol OR (musculoskeletal AND disorder) OR musculoskeletal OR (blood AND pressure) OR (back AND pain) OR disability OR wound OR injury OR (work AND accidents) OR accidents OR morbidity OR mortality OR burnout OR (all-cause AND mortality))

AND (TX (psychosocial AND (stress OR stressors OR conditions OR risk)) OR (psychological AND (stress OR stressors)) OR demand-control OR (support AND work) OR (work AND control) OR (effort AND reward) OR (effort-reward AND imbalance) OR (organizational AND justice) OR (organisational AND justice) OR (strain AND (work AND job)) OR (work AND conditions) OR psychosocial OR workplace OR job OR downsizing OR overtime OR ergonomic OR (hazard AND (physical AND chemical)) OR (work AND (night OR day)) OR (occupation AND stress) OR (work AND characteristics))

AND (TX (disease AND management) OR (health AND circles) OR amigo OR (primary AND intervention) OR prima-ef OR (health AND management) OR (workplace AND health) OR (health AND promotion) OR (shift AND work) OR risk management OR self-scheduling OR (flexible AND scheduling) OR (work AND schedule) OR (reconciling AND work) OR (family AND life) OR (return-to AND work) OR (flexible AND work) OR flexibility OR (compressed AND (hour OR work OR week)) OR (flexible AND salary) OR (life AND balance) OR (work AND (life OR balance)) OR employee OR employer OR (quality AND life) OR (cognitive AND (therapy OR behavio#ral)))

AND ((TI intervention\*) OR (AB intervention\*))

### **Social Science Citation Index (Web of Knowledge)**

(TS=((health AND (subjective OR mental OR physical OR general)) OR manpower OR worker OR (functioning AND health) OR functioning OR (functional AND limitations) OR absenteeism OR (sickness AND absence) OR (depressive AND disorder) OR (affective AND disorder) OR depression OR disease OR (cardiovascular AND disease) OR (heart AND disease) OR coronary OR stroke OR ischem OR ischaemia OR myocard OR hypertension OR obesity OR diabetes OR overweight OR cholesterol OR (musculoskeletal AND disorder) OR musculoskeletal OR (blood AND pressure) OR (back AND pain) OR disability OR wound OR injury OR (work AND accidents) OR accidents OR morbidity OR mortality OR burnout OR (all-cause AND mortality)))

AND (TS=((psychosocial AND (stress OR stressors OR conditions OR risk)) OR (psychological AND (stress OR stressors)) OR demand-control OR (support AND work) OR (work AND control) OR (effort AND reward) OR (effort-reward AND imbalance) OR (organizational AND justice) OR (organisational AND justice) OR (strain AND (work AND job)) OR (work AND conditions) OR psychosocial OR workplace OR job OR downsizing OR overtime OR ergonomic OR (hazard AND (physical AND chemical)) OR (work AND (night OR day)) OR (occupation AND stress) OR (work AND characteristics)))

AND (TS=((disease AND management) OR (health AND circles) OR amigo OR (primary AND intervention) OR prima-ef OR (health AND management) OR (workplace AND health) OR (health AND promotion) OR (shift AND work) OR risk management OR self-scheduling OR (flexible AND scheduling) OR (work AND schedule) OR (reconciling AND work) OR (family AND life) OR (return-to AND work) OR (flexible AND work) OR flexibility OR (compressed AND (hour OR work OR week)) OR (flexible AND salary) OR (life AND balance) OR (work AND (life OR balance)) OR employee OR employer OR (quality AND life) OR (cognitive AND (therapy OR behavi\*))))

AND (TI=(intervention\*))

### **Cochrane (Wiley)**

((health AND (subjective OR mental OR physical OR general)) OR manpower OR worker OR (functioning AND health) OR functioning OR (functional AND limitations) OR absenteeism OR (sickness AND absence) OR (depressive AND disorder) OR (affective AND disorder) OR depression OR disease OR (cardiovascular AND disease) OR (heart AND disease) OR coronary OR stroke OR ischem OR ischaemia OR myocard OR hypertension OR obesity OR diabetes OR overweight OR cholesterol OR (musculoskeletal AND disorder) OR musculoskeletal OR (blood AND pressure) OR (back AND pain) OR disability OR wound OR injury OR (work AND accidents) OR accidents OR morbidity OR mortality OR burnout OR (all-cause AND mortality))

AND ((psychosocial AND (stress OR stressors OR conditions OR risk)) OR (psychological AND (stress OR stressors)) OR demand-control OR (support AND work) OR (work AND control) OR (effort AND reward) OR (effort-reward AND imbalance) OR (organizational AND justice) OR (organisational AND justice) OR (strain AND (work AND job)) OR (work

AND conditions) OR psychosocial OR workplace OR job OR downsizing OR overtime OR ergonomic OR (hazard AND (physical AND chemical)) OR (work AND (night OR day)) OR (occupation AND stress) OR (work AND characteristics))

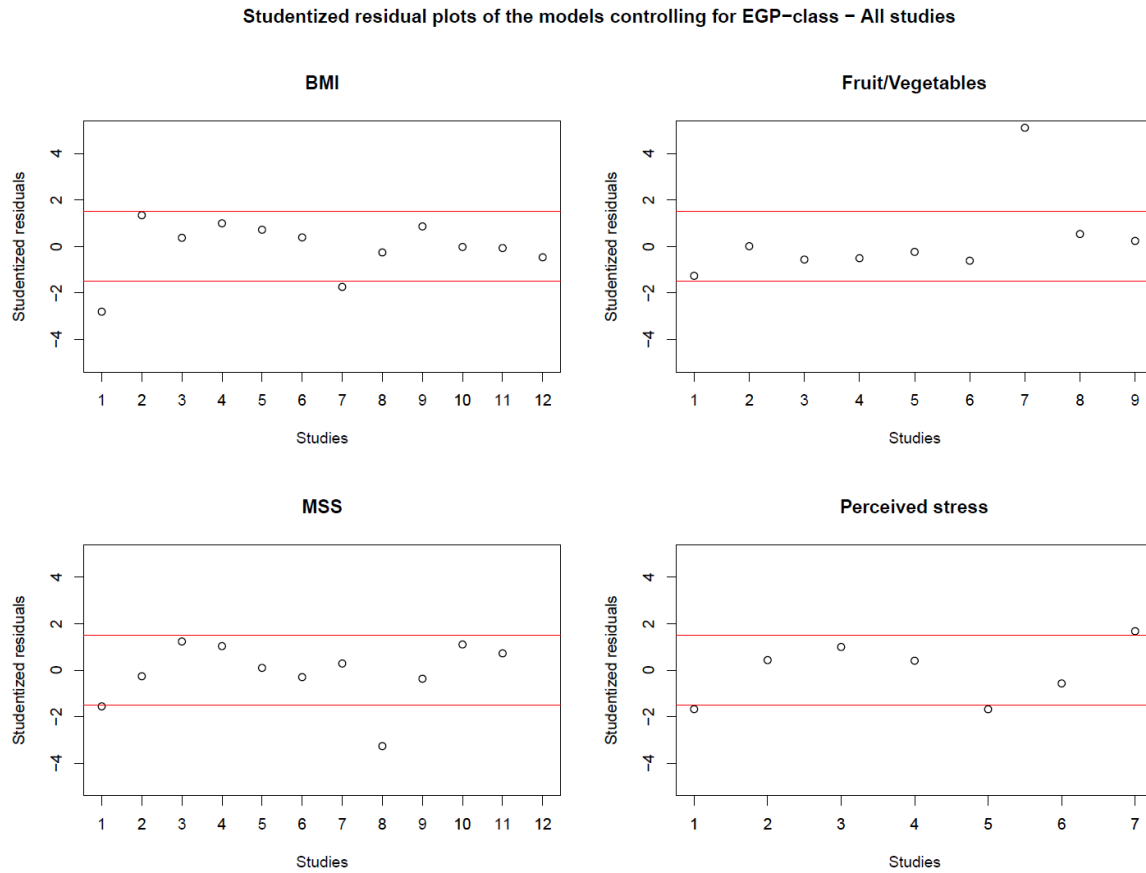
AND ((disease AND management) OR (health AND circles) OR amigo OR (primary AND intervention) OR “prima-ef” OR (health AND management) OR (workplace AND health) OR (health AND promotion) OR (shift AND work) OR risk management OR self-scheduling OR (flexible AND scheduling) OR (work AND schedule) OR (reconciling AND work) OR (family AND life) OR (“return-to” AND work) OR (flexible AND work) OR flexibility OR (compressed AND (hour OR work OR week)) OR (flexible AND salary) OR (life AND balance) OR (work AND (life OR balance)) OR employee OR employer OR (quality AND life) OR (cognitive AND (therapy OR behavioural)))

AND “intervention\*”

### ***3. Sensitivity analysis***

The analysis of the heterogeneity of the random-effects models was based on inspection of the studentized residuals plotted in Figure 2 (see 3 for details). In order to assess the impact of outliers on the heterogeneity and the estimated parameters of the models, we chose a conservative approach and excluded studies whose studentized residuals were less than -1.5 and greater than 1.5, i.e. those residuals lying 1.5 standard-error units away from the expected value zero. The excluded studies were (4,5) for body mass index, (6) for fruit and vegetables consumption, and (7,8) for musculoskeletal symptoms (see table 2 for a description of studies). The common feature of these studies is that they reported unusually large intervention effects in comparison with the rest of studies. Because three out of seven studies of the perceived stress models had studentized residuals less than the absolute value |1.5|, comparisons among EGP classes was not feasible.



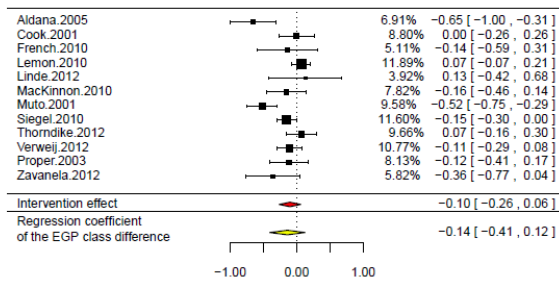


**Figure 2. Residual plots used for the sensibility analysis.**

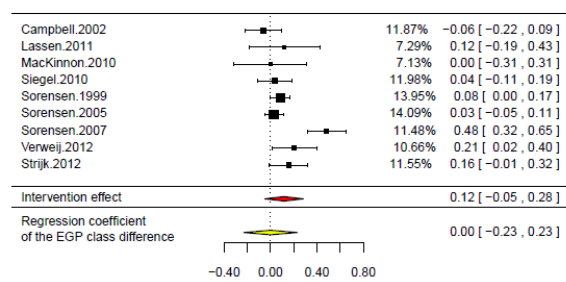
In a second step, we re-estimated the random-effects models for all variables for which it was possible to estimate group differences between EGP classes. The forest plots of both models are reported in Figures 3a and 3b. As it can be seen in those figures, the exclusion of the most influential observations decreases the size of the point estimates of the overall intervention effects and of the EGP class differences (red and yellow diamonds), even though the direction of the effects remains consistent with the models including all studies. At the same time, the estimated heterogeneity between the models with and without outliers is substantially reduced. This was expected due to the fact that heterogeneity is a function of the sampling and random variability of the studies (see equations 9 and 10 in reference (9)). Consequently, even one or two studies may have a huge impact on the overall heterogeneity as it was the case in this meta-analysis, since they were reporting unusually large intervention effects.

### Intervention effects controlled for EGP-class – All studies

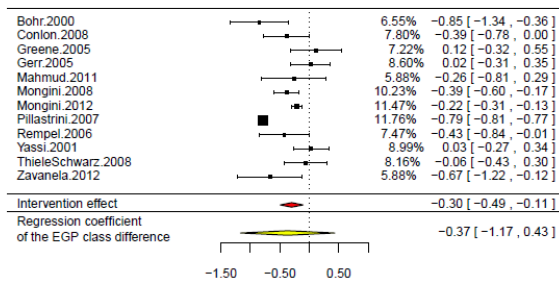
**BMI,  $I^2 = 67.5\%$**



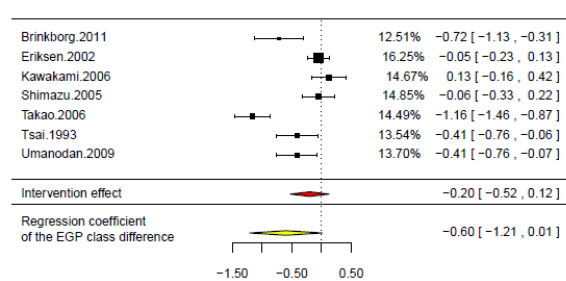
**Fruit/Vegetables,  $I^2 = 79.1\%$**



**MSS,  $I^2 = 91.8\%$**

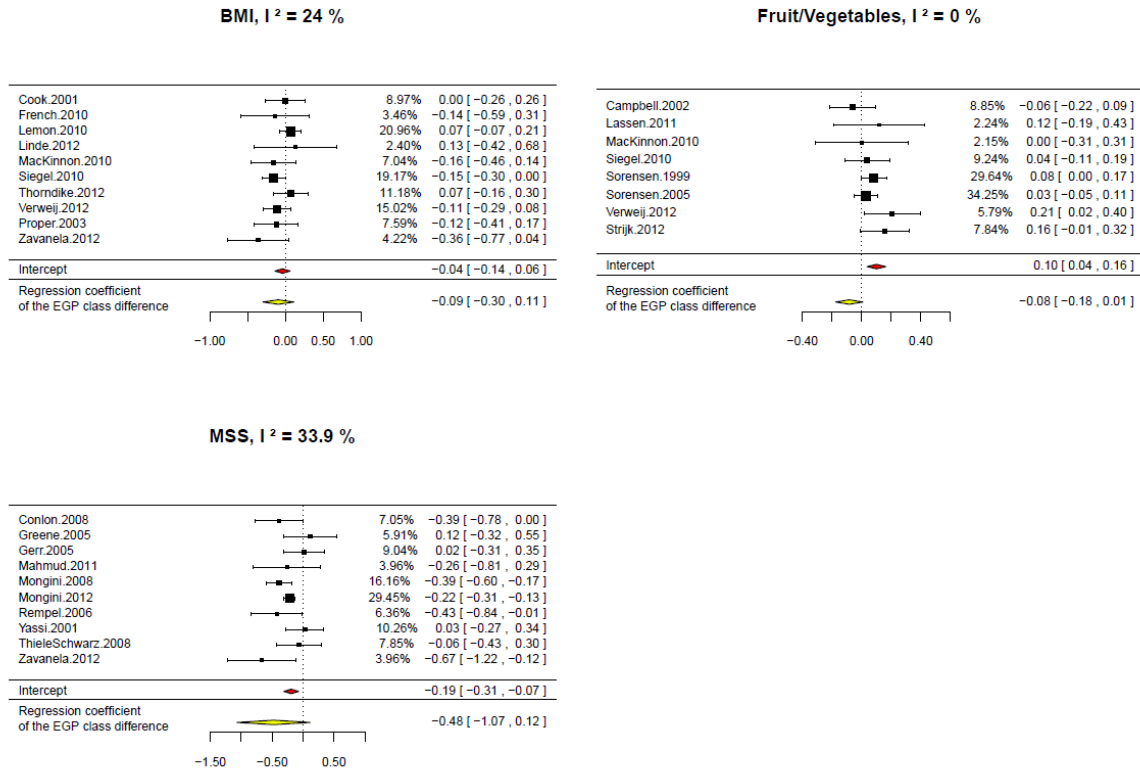


**Perceived stress,  $I^2 = 84\%$**



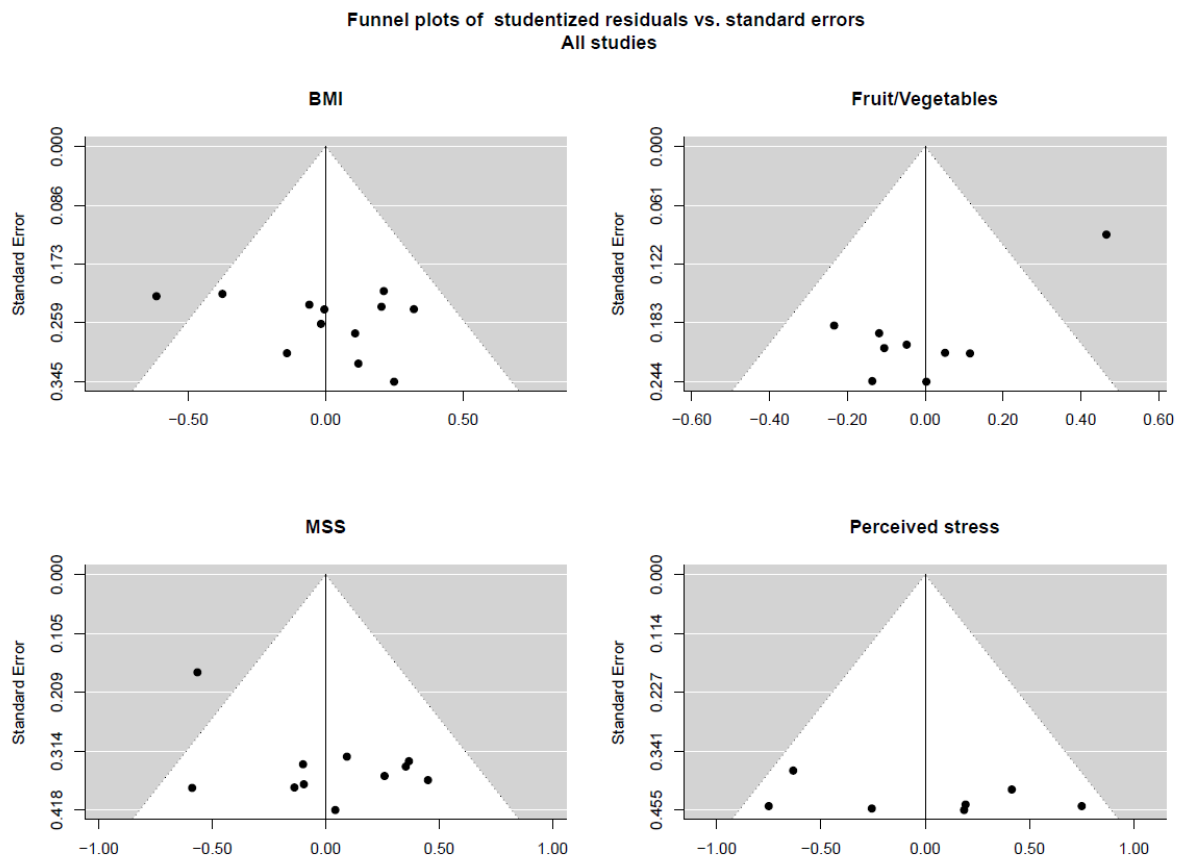
**Figure 3a. Forest plots of random-effects models for all studies included in the review.**

**Intervention effects controlled for EGP-class**  
Only studies with studentized residuals less than |1.5|

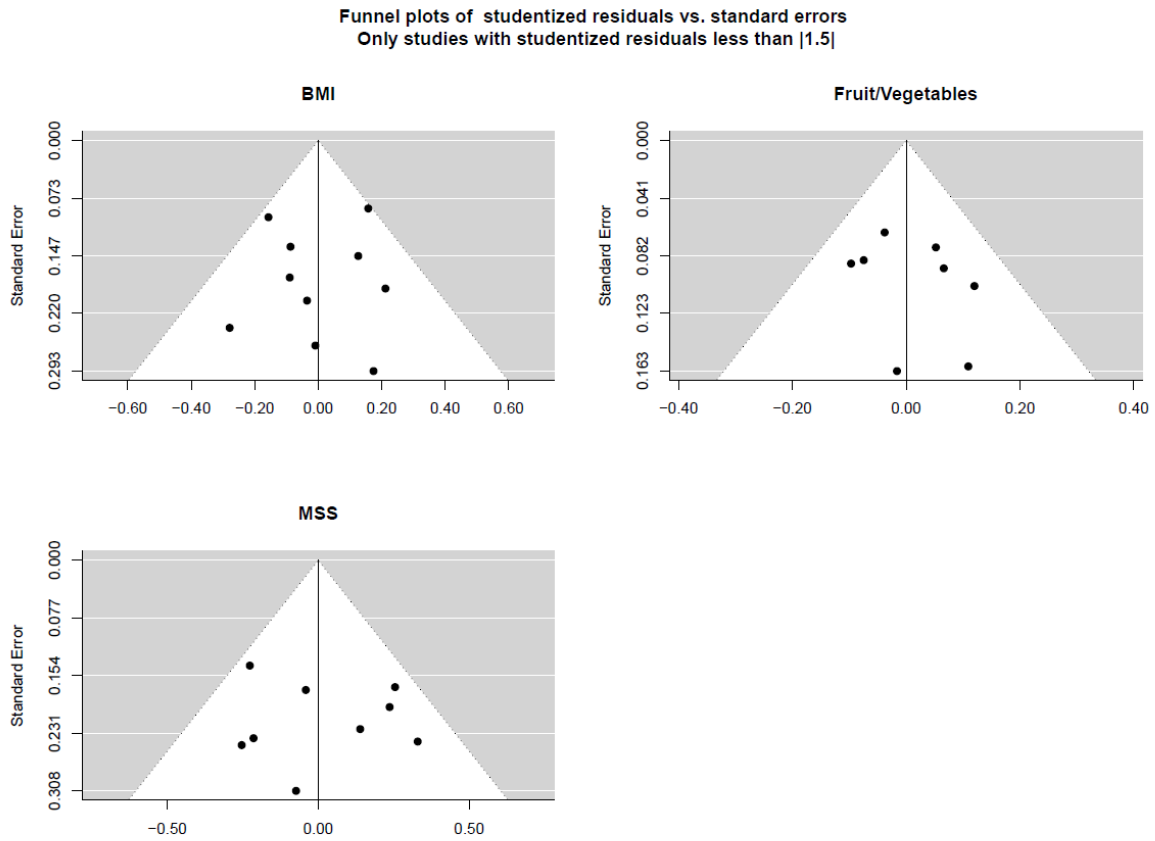


**Figure 3b. Forest plots of models excluding observations whose studentized residuals were greater than -1.5 and less than 1.5.**

In a final step, the funnel plots of the models including all studies and the models excluding influential studies are reported in Figures 4a and 4b. A comparison of both plots confirms that the outliers comprise those studies reporting very large effects, thereby lying outside the 95% confidence stripes. However, a publication bias appears to be unlikely given that the studies seem to be symmetrically distributed around zero, in particular when removing the most influential studies.



**Figure 4a.**



**Figure 4b.**

#### **4. Quality of evidence**

As stated above, the quality of evidence was assigned by following the GRADE approach. In order to facilitate the interpretation of the Hedge estimator  $g$ , we estimated the “relative risk” of intervention success  $RR_{succ}$ , i.e. the probability ratio of benefiting from the intervention in comparison to not implementing any intervention at all, as described by Rosenthal et al. 2000 (10), Ch. 2. The estimation of  $RR_{succ}$  requires the transformation of the effect sizes  $g$  as a point-biserial correlation coefficient  $r$  defined by:

$$r = g/g^2 + 4*(N - 2)/N^{1/2}$$

so that

$$RR_{succ} = (0.50 + r/2) / (0.50 - r/2)$$

Because the only source of variability comes from the effect sizes, the computation of corresponding 95% CI's can be performed by replacing the lower and upper bounds of  $g$ , respectively. The results are reported in table 1. In general, and in part because of the difficulties inherent to the workplace setting, the studies suffered from random allocation

problems (11,8,12,13), blinding (14–17), unaccounted losses to follow up (7,18), or very poor overall reporting (19), among others. We judged these limitations as serious.

**Table 1. GRADE evidence profile of workplace interventions improving selected health outcomes.**

Outcome	N	Quality assessment						Summary of finding	
		No. of studies	Study limitation	Consistency	Directness	Precision	Publication bias	RR (BESD) and 95% CI	Quality
BMI	5863	12	Serious limitations (-1)	Unlikely large effects (-1)	Direct	No important imprecision	Unlikely	0.90 (0.77 – 1.06)	++, low
Fruit/Veg etable consumption	7096	9	Serious limitations (-1)	Unlikely large effects (-1)	Direct	No important imprecision	Unlikely	1.12 (0.95 – 1.33)	++, low
MSS	3501	12	Serious limitations (-1)	Unlikely large effects (-1)	Measures included all upper limb symptoms	No important imprecision	Unlikely	0.74 (0.61 – 0.9)	++, Low
Perceived stress	1517	7	Serious limitations (-1)	Unexplained heterogeneity (-1)	Direct	Imprecision (-1)	Unlikely	0.82 (0.60 – 1.13)	+, Very low

**Table 1. Summary of interventions included in the meta-analyses. Identifier = First author and year of publication, N = total sample size, EGP = Ericson-Goldthorpe-Portocarrero occupational class scheme, Sample = Original sample description in the study, Measure = Outcome included in the meta-analyses, *g* = standardized mean differences, SE = standard error of the standardized mean differences.**

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
Aldana et al. 2005 (4)	137	Cognitive behavioral	Participants met for 4 weeks, 4 times each week for 2 hours each instruction session. The topics of the meetings were: modern medicine and health myths, atherosclerosis, coronary risk factors, obesity, dietary fiber, dietary fat, diabetes, hypertension, cholesterol, exercise, osteoporosis, cancer, lifestyle and health, the optimal diet, behavioral change, and self-worth. Additionally, participants had access to schedule shopping tours and cooking demonstrations given by a dietitian.	I-III	Health care	BMI	-0.65	0.18
Campbell et al. 2002 (11)	650	Cognitive behavioral	Two-component intervention: 1) individualized computer-tailored “women’s magazines” that provided personalized feedback, strategies for change, and community resource information and (2) a natural helpers intervention that trained women in the workplace to diffuse information and provide support for healthy behavior changes.	VI-VII	Blue-collar women	Fruit/Vegetables	-0.06	0.08
Greene et al. 2005 (20)	82	Cognitive behavioral	Active ergonomics training (AET). Six hours of didactic interactions, discussion, and problem-based activities. Key elements: 1) skill development in problem-solving for ergonomic workstation issues; 2) active participation; and 3) integration of multiple prevention strategies.	I-III	University employees	MSS	0.11	0.22
Shimazu et al. 2005 (16)	204	Cognitive behavioral	Web-based psycho-education on self-efficacy, problem solving behavior, stress responses, and job satisfaction.	I-III	Clerical and managerial occupations	Perceived stress	-0.06	0.14
Bohr 2000 (7)	103	Ergonomics	Two intervention groups. 1) 1-hour education session that consisted of lecture, informational handouts, ideal neutral postures; 2) 2-hour active learning sessions on workstation evaluation and modification, problem solving of ergonomic problems	I-III	Reservation center	MSS	-0.85	0.25

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
Conlon et al. 2008 (21)	103	Ergonomics	Introduction of an alternative mouse plus a forearm support board.	I-III	Engineers	MSS	-0.39	0.20
Gerr et al. 2005 (22)	225	Ergonomics	Postural intervention for reducing neck/shoulder symptoms according to OSHA, NIOSH and private industry recommendations.	I-III	Mainly professionals, clerical	MSS	0.02	0.17
Mahmud et al. 2011 (18)	98	Ergonomics	Intervention in 2 sessions: 1) lectures on office ergonomics, i.e. relationship between office ergonomics and the development of musculoskeletal disorders, ergonomic improvements and adjustments of workstations, and stretching exercises. 2) Trainers visited the participants' workstations and provided assistance to them on how to adjust workstations effectively	I-III	Office workers	MSS	-0.26	0.28
Pillastrini et al. 2007 (8)	196	Ergonomics	Informative brochure on evidence dealing with musculoskeletal disorders resulting from video display terminals. Participants received the advice and supervision of a physical therapist for the ergonomic adjustment of their workstation	I-III	Computer workers	MSS	-0.79	0.01
Rempel et al. 2006 (23)	91	Ergonomics	Introduction of a forearm support board, trackball, and ergonomics training:	I-III	Computer workers	MSS	-0.43	0.21
Yassi et al. 2001 (24)	166	Ergonomics	Introduction of a mechanical lift, transfer belt or mechanical total body lift, slide devices and transfer belts.	I-III	Health care	MSS	0.03	0.16
Cook et al. 2001 (25)	226	Health education	Nutrition displays in the cafeteria and monthly 30-minute workshops for six months.	VI-VII	Blue collar	BMI	0.00	0.13



Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
Kawakami et al. 2006 (26)	189	Health education	4-week training program for supervisors on worksite mental health. Supervisors had to read and understand government guidelines for promoting mental health	I-III	White collar	Perceived stress	0.13	0.15
Takao et al. 2006 (17)	226	Health education	1-hour education program for supervisors on early awareness of mental health, support for those returning to work, consultation for subordinates, improvement of working environments, self-care recommendations, and information regarding mental problems	VI-VII	Brewery workers	Perceived stress	-1.16	0.15
Mongini et al. 2008 (27)	344	Health education	Instructions of brief shoulder and neck exercises to be performed several times a day, a relaxation exercise, and instructions on how to reduce parafunction and hyperfunction of the craniofacial and neck muscles during the day	I-III	White collar	MSS	-0.39	0.11
Mongini et al. 2012 (28)	1881	Health education	Instructions of brief shoulder and neck exercises to be performed several times a day, a relaxation exercise, and instructions on how to reduce parafunction and hyperfunction of the craniofacial and neck muscles during the day.	I-III	White collar	MSS	-0.22	0.05
Verweij et al. 2012 (29)	425	Health education	Implementation of guideline recommendations for occupational physicians. Three intervention levels were aimed: (a) prevention at the environmental level (advice for the employer), (b) prevention at the individual level (advice for the employee, i.e. behavioral change counseling) and (c) evaluation and maintenance of guideline sections.	I-III	Health care	Fruit/Vegetables	0.21	0.01
Verweij et al. 2012	425	Health education	Implementation of guideline recommendations for occupational physicians. Three intervention levels were aimed: (a) prevention at the environmental level (advice for the employer), (b) prevention at the individual level (advice for the employee, i.e. behavioral change counseling) and (c) evaluation and maintenance of guideline sections	I-III	Health care	BMI	-0.19	0.09

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	g	SE
French et al. 2010 (14)	832	Health promotion	Formation of advisory groups, changes in the physical and social environment at the workplaces to support more healthful food choices and higher levels of physical activity, reconfiguration of vending machines, improvement of fitness facilities, implementation of a self-weighing competition, behavioral food and physical activity programs, 1-day health and fitness expo, mini-farmer's markets during the summer months, peer-mentoring program for new employees	VI-VII	Transportation	BMI	-0.14	0.23
Lassen et al. 2011 (30)	168	Health promotion	Free fruit program, healthy canteen choices, weekly food deliveries, healthy lunchtime clubs, free cold water, curtail soda and candy sales, kick-off event, food workshop, informational material, dinner mats, computer-based activities, monthly new magazine, health policy	VI-VII	Blue collar	Fruit/Vegetables	0.12	0.16
Lemon et al. 2010 (31)	806	Health promotion	Promotion of healthy eating and physical activity at the worksite. Introduction of a social marketing campaign using logos, themes and messages through newsletter, a website, an info-center with print materials, stairway signs promoting health behaviors, indoor and outdoor walking tours and maps with mileage and step counts, cafeteria signs noting nutritional information, introduction of healthy menu options at the cafeterias, farmer's market in one intervention site	I-III	Health care	BMI	0.07	0.07
Linde et al. 2012 (32)	1672	Health promotion	Availability of nutrition information of foods present in the cafeteria during lunch meal period, promotion of walking/stair use, weight self-monitoring, health information at work	I-III	Mainly white collar	BMI	0.13	0.28
MacKinnon et al. 2010 (33)	168	Health promotion	Team leaders headed 45-minute sessions. Scripted manuals were used that comprised 3 to 6 activities. Core content of the scripts involved nutrition and physical activity. Other contents were stress, sleep deprivation, tobacco use, etc. Employees assessed and discussed goals and ways to collaborate on reaching objectives. Additionally, motivational interviewing focused on healthy nutrition and physical activity	VI-VII	Firefighters	Fruit/Vegetables	0.00	0.16

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
MacKinnon et al. 2010	168	Health promotion	Team leaders headed 45-minute sessions. Scripted manuals were used that comprised 3 to 6 activities. Core content of the scripts involved nutrition and physical activity. Other contents were stress, sleep deprivation, tobacco use, etc. Employees assessed and discussed goals and ways to collaborate on reaching objectives. Additionally, motivational interviewing focused on healthy nutrition and physical activity	VI-VII	Firefighters	BMI	-0.16	0.15
Muto et al. 2001 (5)	302	Health promotion	Implementation in two parts: a main program and a follow-up program. The main program was conducted for 4 days and consisted of education on nutrition, physical activity, stress, and cardiovascular disease risk factors through lectures, practical training, individual counseling, group discussion and self-education. The emphasis was on nutrition and physical activity. The	VI-VII	Maintenance workers	BMI	-0.52	0.12
Siegel et al. 2010 (12)	672	Health promotion	Formation of wellness committee of volunteers to develop and implement health promotion activities. Most activities were directed at improving diet (e.g. healthy snacks at meetings) or increasing physical activity (e.g. walking clubs)	I-III	Elementary school personnel	Fruit/Vegetables	0.04	0.07
Siegel et al. 2010	672	Health promotion	Formation of wellness committee of volunteers to develop and implement health promotion activities. Most activities were directed at improving diet (e.g. healthy snacks at meetings) or increasing physical activity (e.g. walking clubs)	I-III	Elementary school personnel	BMI	-0.15	0.07
Sorensen et al. 1999 (34)	2123	Health promotion	At the individual level: a kickoff event, festive activities designed to raise program awareness and provide educational opportunities, a discussion about purchase and preparation of healthful meals, 1 educational campaign on nutrition education activities that lasted 3 to 5 weeks. At the environmental level: increase of offerings of fruits and vegetables in vending machines, at special-occasion meals and snacks, posters, videos, and brochures placed where employees eat	I-III	Health care	Fruit/Vegetables	0.08	0.04

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
Sorensen et al. 2005 (35)	1737	Health promotion	Formation of employee advisory boards in order to enhance employee participation. At the individual level: small-group discussions, worksite-wide events, health fairs, behavioral self-assessments, educational materials for workers' families, encouragement. At the environmental level: policies aimed at offering healthful food options at company meetings and events, providing facilities for physical activity, and a smoke-free worksite	VI-VII	Mainly blue collar	Fruit/Vegetables	0.03	0.04
Sorensen et al. 2007 (6)	578	Health promotion	One-to-one motivational interviewing counseling sessions, a mailed tailored feedback report, written educational materials	VI-VII	Construction workers	Fruit/Vegetables	0.48	0.08
Thorndike et al. 2012 (36)	302	Health promotion	Access to a personalized web page to monitor weight, exercise and nutrition goals of employees. Every 3 months employees were given the option to meet individually with the study nutritionist and the personal trainer	I-III	Health care	BMI	0.07	0.11
Proper et al. 2003 (37)	190	Health education	Employees were offered 7 individual consultations (each 20 minutes) with a physiotherapist. Counseling focused on the enhancement of the individual's level of physical activity and promotion of healthy behavior habits	I-III	White collar	BMI	-0.12	0.15
Eriksen et al. 2002 (38)	506	Physical activity	The implementation consisted of: 1) a physical exercise program; 2) information about stress, coping, health, nutrition, etc.; 3) a practical examination at the worksite	I-III	Postal service employees	Perceived stress	-0.05	0.09
Strijk et al. 2012 (39)	575	Physical activity	The implementation consisted of: 1) a vitality exercise program (VEP), 2) provision of free fruit and 3) a personal vitality coach. The VEP consisted of a weekly 45 min yoga session, workout session and a unsupervised aerobic exercise session	I-III	Plus 45 hospital workers	Fruit/Vegetables	0.16	0.08
Thiele-Schwarz et al. 2008 (40)	116	Physical activity	2.5 hours of weekly work-hours were allocated to mandatory physical exercise on two different days	I-III	Health care, women	MSS	-0.06	0.19

Identifier	N	Intervention type	Implementation	EGP	Sample	Measure	<i>g</i>	SE
Tsai et al. 1993 (19)	138	Physical activity	Relaxation training consisting of a presentation by the researcher about 1) sources of stress at work, 2) relaxation as a method to cope with stress; and 3) the process of relaxation that included breathing exercise, imagery and meditation.	I-III	Nurses	Perceived stress	-0.41	0.18
Umanodan et al. 2009 (13)	148	Physical activity	6-session monthly multicomponent program consisting of: 1) relaxation training; 2) a lecture on a selected topic concerning managing stress; 3) exercise; 4) questions and summary at the end of each session	VI-VII	Steel company workers	Perceived stress	-0.41	0.17
Zavanela et al. 2012 (41)	96	Physical activity	A 24-week exercise program. Employees attended 3 training sessions from weeks 0 to 8 and 4 training sessions from weeks 9 to 24.	VI-VII	Bus drivers	BMI	-0.36	0.21
Zavanela et al. 2012	96	Physical activity	A 24-week exercise program. Employees attended 3 training sessions from weeks 0 to 8 and 4 training sessions from weeks 9 to 24.	VI-VII	Bus drivers	MSS	-0.67	0.28
Brinkborg et al. 2011 (15)	106	Stress management	4 sessions of 3 hours each, provided every other week. The group sizes vary between 7 and 30 participants. Each session has a specific theme and follows the same structure. Between sessions, the participants complete homework assignments, including physical exercise and mindfulness practice	I-III	Social workers	Perceived stress	-0.72	0.21

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