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Table 1. Categories of Intervention Programs

Intervention Program Category	Study/Primary Reference	Focus of Intervention Program	Intervention Methodology
a. Very large scale company-wide makeover programs (HP+OSH-W)	Bertera (1990)	Broad HP and OSH program.	Risk assessments, training, self-directed behavior change, incentives
	Dalton and Harris (1991)		Prevention services, targeted messages, counseling, feedback, incentives
b. Programs that had substantial and evenly addressed HP and OSH components (HP+OSH)	Eriksen et al. (2002)	Physical exercise (PE), stress management training (SMT), and an integrated program (IHP) of exercise, stress management coping and nutrition were compared.	Training, exercise programs
	Wellworks-2: Sorensen et al. (2002)	Comprehensive OSH program targeted at reducing workplace exposure hazards, and an HP program to reduce tobacco consumption and increase healthy eating.	Participatory intervention, professional consultation, training
	SHIFT: Olson, Anger, Elliot, Wipfli, and Gray (2009)	Weight loss and safe driving competition, with training/coaching in healthy eating, exercise, and injury prevention.	Training, competition (team strategies), motivational interviewing, self-monitoring, feedback, incentives
c. Programs in which either the HP or OSH component of the intervention was addressed in a stronger or broader fashion than the other component (HP+osh and hp+OSH), and programs with narrowly focused HP and OSH components (hp+osh)	Healthy Directions: Sorensen et al. (2005)	Broad wellness program combined with an OSH program focused on reducing exposure to carcinogens that synergize with cancers associated with smoking (HP+osh).	Training, interactive activities, industrial hygiene recommendations
	Peters and Carlson (1999)	Broad wellness and well-being program with largely unspecified safety training information (HP+osh).	Training, self-assessments, goal setting, behavior contracting, self-management, feedback, incentives
	PHLAME: Elliot et al. (2007)		Scripted training, team strategies, feedback, motivational interviewing
	Rasmussen et al. (2006)	OSH program focused on psychosocial factors to reduce eczema and occupational accidents, and to improve mental health (hp+OSH).	Group participatory process to target and solve problems (team strategies)
	Tsutsumi, Nagami, Yoshikawa, Kogi, and Kawakami (2009)	Broad OSH program focused on reducing job stress and on improving mental health (hp+OSH).	Group participatory process to target and solve problems (team strategies)
	Tveito and Eriksen (2009)	Broad OSH program focused on physical exercise, stress and stress management, and job redesign with smoking and lifestyle components (hp+OSH).	Professional exercise trainers to implement exercise program, group participatory processes to plan/implement job redesign, training on

			lifestyle issues
	Wellworks: Sorensen et al. (1995)	Programs targeted at reducing tobacco consumption and workplace exposure hazards, and increasing healthy eating (hp+osh).	Participatory intervention, professional consultation, training
d. Programs addressing a single problem or using a single method that addresses both HP and OSH needs (hp+osh-S)	MassBUILT: Okechukwu, Krieger, Sorensen, Li, and Barbeau (2009)	Program aimed at reducing smoking and reducing exposures to chemicals that synergize with smoking (thus increasing cancer risk) to reduce cancer risk.	Health risk appraisal, training, feedback, motivational interviewing
	Alkhajah et al. (2012)	Program designed to reduce sitting and increase exercise to improve both health and safety.	Training and experience using a sit-stand station
	Take-a-Stand: Pronk, Katz, Lowry, and Payfer (2012)	Program designed to reduce sitting and increase exercise with implications for safety (e.g., reducing musculoskeletal injuries).	Experience using sit-stand station, incentives
	Konradt, Schmook, Wilm, and Hertel (2000)	Program to reduce job stress with safety and efficiency benefits.	Group processes (team strategies) to identify and solve problems
	Ott et al. (2009)	Company-wide program that used the medical exam as a health and safety management tool.	Medical exams as a tool to target problems, training

Abbreviations: HP = Health Promotion; OSH = Occupational Safety and Health.

Table 2. Study Design, Design Causal Inference Strength Rank, Sample Size, and Industry.

Study	Rank	Study Design	Intervention package	Sample (N), Industry, Country
WellWorks-2: Sorensen et al. (2002); Sorensen et al. (2003); LaMontagne et al. (2004); Hunt et al. (2005); LaMontagne, Stoddard, Youngstrom, Lewiton, and Sorensen (2005)	1	Sorensen: Pre/Post Cluster Randomized Trial LaMontagne: Using the same recruited group, LaMontagne focused on intervention effects on organizational support elements as the dependent variable rather than employee health.	Integrated participatory management-labor intervention that provided exemplary policy changes on tobacco and healthy food options and a health education program on individual lifestyle changes coupled with industrial hygiene walk-throughs leading to written assessments, individual consultations, recommendations on upstream exposure prevention, policies, written materials, and educational programs on reducing exposure hazards. An HP-only group was compared to an HP+OSH group to test the value of integration of HP and OSH.	Sorensen: 7327 participants in 15 US manufacturing companies received an HP-only (n=3710) or an HP+OSH (n=3617) program. LaMontagne: > 400 workers from manufacturers with, and probable use of, hazardous substances. Workers randomly assigned within blocks (e.g., union vs. non-union) to HP+OSH and HP only (comparison) groups.
MassBUILT: Okechukwu et al. (2009); Okechukwu, Krieger, Sorensen, Li, and Barbeau (2011)	1	Pre/Multiple-Post Cluster Randomized Trial	Intervention taught the additive or synergistic cancer risks from smoking tobacco *and* exposures to hazardous chemicals, dusts, fumes at work, supported by motivational interviewing.	1,213 workers at 10 apprenticeship sites in the US building trades. Data collected baseline, 4 months (1 month post 3-month intervention).
Healthy Directions: E. M. Barbeau et al. (2004); E. Barbeau et al. (2004); Sorensen et al. (2005); Stoddard et al. (2005); Sorensen et al. (2007)	1	Pre/Post Cluster Randomized Trial	Intervention improved workplace environment (e.g., healthful food at meetings), taught improved lifestyle choices, and provided industrial hygiene walkthroughs to recommend methods to reduce exposures to carcinogens.	974 participants at 22 US worksites with multi-racial, multi-ethnic workforces completed both baseline and follow-up surveys.
Eriksen et al. (2002)	1	Four-group Randomized Controlled Trial (RCT) with one pretest and two posttest assessments	Intervention compared effectiveness of: (1) Physical exercise (PE), (2) stress management training (SMT), and (3) an integrated program of exercise, strength training, stress management, alternative working positions, coping and lifestyle factors related to sleeping and eating behaviors (IHP) to a Control group (C).	860 Norwegian postal service employees randomly assigned to Control group (N=344), Physical Exercise (PE) (N=189), Stress Management Training (SMT) (N=162), IHP (N=165). At follow-up, N was reduced: C (N=166), PE (N=114), SMT (N=98), IHP (N= 94).

PHLAME: Moe et al. (2002); Elliot et al. (2007); MacKinnon et al. (2010); Ranby et al. (2011); Elliot et al. (2012); Pirlott, Kisbu-Sakarya, Defrancesco, Elliot, and Mackinnon (2012); K. S. Kuehl et al. (2013); Kuehl, Mabry, Elliot, Kuehl, and Favorite (2013)	1 OSH Data: 2	Pre/Post Cluster Randomized Trial (Elliot: HP) Two-group Non-equivalent Control Group Pre-test/Post-test Quasi-Experimental Design (Kuehl: OSH)	Intervention compared: (1) a scripted team-based healthy lifestyle curriculum, to (2) individual-based motivational interviewing following topics including nutrition, physical activity, sleep, stress. A fitness guide on musculoskeletal injuries related to work activities was provided to each group.	Elliot HP analysis: 599 US firefighters (579 male) randomized to: 1) team-centered training (T), 2) individual-centered motivational interviewing (MI), or 3) control (survey and fitness results only) group. Kuehl OSH data: 1369 (total) firefighters compared to controls (I=624; C=745 at end of study).
WellWorks: Sorensen et al. (1995); Sorensen, Stoddard, Ockene, Hunt, and Youngstrom (1996); Sorensen et al. (1998)	1	Cluster randomized (matched-pairs) design; 1996 article focuses on health program participation rather than worker health as a direct outcome; 1998 article focuses on health outcomes	Integrated participatory management-labor intervention that provided exemplary policy changes on tobacco and healthy food options and a health education program on individual lifestyle changes coupled with consultation and principles of industrial hygiene (e.g., substitution) to reduce exposure hazards.	Over 250 workers using known or suspected carcinogens in work processes at 24 US worksites (primarily manufacturers). Random sample of 2386 workers (subgroup n not identified) from the 24 worksites for the pre- and post-assessments.
Tsutsumi et al. (2009)	1	Pre/Post Cluster Randomized Trial	Participatory intervention in factory workers that taught the benefits of workplace improvements including job redesign and team-based problem solving to improve mental health, safety and productivity.	47 employees in 6 automobile assembly lines; 50 controls in 5 automobile assembly lines, in Japan.
Peters and Carlson (1999)	1	Two-group Randomized Controlled Trial (RCT) with one pretest and two posttest assessments	Intervention incorporated a standardized health risk appraisal, stress management training, educational workshops and counseling, and a self-directed behavior change program including meditation and self-monitoring focused on lifestyle changes and unsafe work practices.	40 maintenance employees from the Building and Grounds Department at the University of Hawaii (I = 21; C = 19).
Tveito and Eriksen (2009)	1	Pre/Post Two-Group Randomized Trial	Intervention provided a physical exercise program, stretching, stress management training and health information to motivate lifestyle changes. Employee discussions designed to change job organization based on a practical examination of the	19 intervention and 21 comparison nursing home employees in Norwegian elder care nursing homes.

			workplace.	
Bertera (1990); Bertera (1993)	2	Two-group Non-equivalent Control Group Pre-test/Post-test Quasi-Experimental Design	Intervention provided a comprehensive workplace health promotion program focused on illness absences not related to occupational causes, including health risk appraisals, health education options on healthy lifestyles, vending option improvements, incentive programs for fitness, weight control and smoking cessation, and education on healthy backs and stress management plus safety meetings linked to the program.	7178 blue collar workers at 41 intervention sites vs. 7101 workers at 19 control sites in diversified US industrial company that had not adopted the program; some analyses may have used larger Ns.
Rasmussen et al. (2006)	2	Two-group Non-equivalent Control Group Pre-test/Post-test Quasi-Experimental Design	Participatory intervention involving occupational risk assessments, work observations, better personal protective equipment, education on psychosocial factors and safety, safety walk-arounds, and accident and injury and toxicology databases.	575 intervention participants vs. 270 comparison wind turbine manufacturing employees (minimum n's) in Denmark.
Take-a-Stand: Pronk et al. (2012)	2	Reversal Interrupted-time-series Quasi-Experimental Design (participants self-selected to the intervention group, but subsequently the sit-stand desks were withdrawn and data collected in a post-intervention period).	Intervention was a health, wellness and psychological well-being program with incentives to participate in physical activity combined with the introduction of sit-stand workstations.	24 intervention vs. 10 control health promotion employees in Minnesota's (US) Health Partners health system.
Alkhajah et al. (2012)	2	Two-group Non-equivalent Control Group Pre-test/Post-test Quasi-Experimental Design	Introduced and trained participants to use sit-stand workstations to modify time sitting and standing, health biomarkers, and acceptability.	18 intervention and 12 comparison University of Queensland (Australia) office workers.
Dalton and Harris (1991)	3	One-group Pre-program/Post-program Multiple Time Point design (although the pre-program measures were in 1984, the same year the various	Health promotion program providing healthy food options, cigarette vending removed, smoking prohibition policy, on-site screening and chronic disease monitoring, counseling, incentives to join HMOs, augmented safety and industrial	US Telecommunications equipment supplier employees (no N for most results); N= ~600 for health behavior prevalence; N=78 for self-reported health behaviors.

		programs were implemented so the "pre" part may be considered to be pretty weak)	hygiene program with accident frequency targets, surveys, job redesign, safety improvement competitions and medical management of disabilities.	
SHIFT: Olson et al. (2009); Wipfli, Olson, and Koren (2013)	3	Olson: One-group Pre-program/Post-program design. Wipfli: Multiple Post-program Design	Weight loss and safe driving (hard braking, percent time overspeed, moving violations) competition supported with computer-based training on diet, exercise, and safety; behavioral self-monitoring activities; motivational interviewing sessions with a health coach.	29 truck drivers from four US companies (Olson); 15 drivers in follow-up at 36 months from the initiation of the intervention (Wipfli).
Konradt et al. (2000)	4	Two-group Non-equivalent Control Group Post-test-only Quasi-Experimental Design	Health Circles led by a facilitator were designed to engage employees to develop workplace improvements in ergonomics and to develop coping strategies to deal with stress (at work and outside).	17 intervention vs. an unspecified number of controls in a convenience sample in German telecommuting (services) company workers with non-random assignment. 11 intervention vs. 12 control participants at 2 months post-intervention follow-up.
Ott et al. (2009); Ott et al. (2010)	5	Multiple group non-experimental design	Used health exams to focus changes in health retreats, health seminars and prevention steps such as respirator use, physical activity, reducing chemical exposures.	14,128 male wage employees in German chemical manufacturing company assigned to 1 of 2 rotating shift work schedules at some time between 1995 and 2005 and who completed at least 1 year of rotating shift work vs. 17,218 reference male wage employees assigned to day work for at least 1 year.

Note: I = Intervention; C = Control.

Table 3: Categorization of Methods Used in HP and OSH Intervention Program Studies, the Number of Studies Addressing Each Category, and the Reference or Program Name.

Category	Number of Studies	Reference/Program Identifier
Antecedents: Organizational Structure		
Systems or Policy Changes	7	Healthy Directions, Wellworks, Wellworks-2, Rasmussen et al. (2006), Take-a-Stand, Dalton and Harris (1991), Ott et al. (2009)
Employee involvement in program design or implementation	9	Healthy Directions, PHLAME, Tsutsumi et al. (2009), Tveito and Eriksen (2009), Wellworks, Wellworks-2, Bertera (1993), Rasmussen et al. (2006), Konradt et al. (2000)
Antecedents: Environment Changes		
Environment changes/facilities (e.g., exercise equipment, healthy food options, removal of cigarette vending machines, increased availability of Personal Protective Equipment)	6	Healthy Directions, Wellworks, Wellworks-2, Bertera (1993), Rasmussen et al. (2006), Dalton and Harris (1991)
Environment changes/healthy management or supervision practices (e.g., stress reduction)	3	Tsutsumi et al. (2009), Rasmussen et al. (2006), Konradt et al. (2000)
Environment changes/health care access	1	Dalton and Harris (1991)
Environment changes/process reviews (e.g., Industrial Hygiene walk-throughs or use of Industrial Hygiene principles)	4	Healthy Directions, Wellworks, Wellworks-2, Rasmussen et al. (2006)
Physical environment/tool (e.g., Sit-stand stations)	2	Alkhajah et al. (2012), Take-a-Stand
Job Design/Redesign	5	Tsutsumi et al. (2009), Tveito and Eriksen (2009), Wellworks, Rasmussen et al. (2006), Dalton and Harris (1991)
Antecedents: Assessments		
Health Risk Assessments, organizational assessments: safety/health/wellness/well-being	11	Healthy Directions, Peters and Carlson (1999), PHLAME, Tsutsumi et al. (2009), Wellworks, Wellworks-2, Bertera (1993), Rasmussen et al. (2006), Dalton and Harris (1991), SHIFT, Ott et al. (2009)
Antecedents: Training/Education		
Scripted training/workbook	6	Eriksen et al. (2002), Healthy Directions, MASSbuilt, Peters and Carlson (1999), PHLAME, Bertera (1993)
Newsletters, written communications or information	2	Wellworks, Wellworks-2
Computer-based training	1	SHIFT
Educational classes by professional trainers or facilitators	7	Eriksen et al. (2002), Healthy Directions, MassBUILT, Peters and Carlson (1999), Tveito and Eriksen (2009), Konradt et al. (2000), Ott et al. (2009)
Educational classes by internal trainers or	6	PHLAME, Tsutsumi et al. (2009), Wellworks, Wellworks-2, Bertera (1993),

facilitators		Rasmussen et al. (2006)
Activities (e.g., Health Fairs, nicotine patches, newsletters, posters, contests, advertisements/promotion)	8	Healthy Directions, MassBUILT, PHLAME, Wellworks-2, Bertera (1993), Dalton and Harris (1991), SHIFT, Ott et al. (2009)
Behavioral Processes		
Self-Management/Self-monitoring	2	Peters and Carlson (1999), SHIFT
Motivational Interviewing/Counseling	6	MassBUILT, Peters and Carlson (1999), PHLAME, Bertera (1993), Dalton and Harris (1991), SHIFT
Meditation/relaxation	1	Peters and Carlson (1999)
Group or team change strategies	5	PHLAME, Tsutsumi et al. (2009), Rasmussen et al. (2006), SHIFT, Konradt et al. (2000)
Self-directed behavior change	2	Peters and Carlson (1999), Bertera (1993)
Consequences		
Feedback, including feedback as part of training, motivational interviewing, behavioral contracting, self-monitoring	5	MassBUILT, Peters and Carlson (1999), PHLAME, Dalton and Harris (1991), SHIFT
Incentives for participation	4	Bertera (1993), Take-a-Stand, Dalton and Harris (1991) (for HMOs), SHIFT
Incentives for improvement/behavioral contracting	4	Peters and Carlson (1999), Bertera (1993), Dalton and Harris (1991) (company level), SHIFT

Table 4. Significant Outcome Measure Changes Reported by Study.

Significantly Changed Measures	# measuring	Wellworks-2	MassBUILT	Healthy Directions	Eriksen et al. (2002)	PHLAME	Wellworks	Tsutsumi et al. (2009)	Peters and Carlson (1999)	Tveito and Eriksen (2009)	Bertera (1993),	Rasmussen et al. (2006)	Take-a-Stand	Alkhajah et al. (2012)	Dalton and Harris (1991)	SHIFT	Konradt et al. (2000)	Ott et al. (2009)
Objectively Measured Changes																		
Weight	4					•			•		•					•		
Blood Pressure (systolic)	3								•		•				•			
Cholesterol (total)	3								•		•			•				
BMI	2					•										•		
Waist Circumference, Body fat, VO2max, Eczema cases, sit & reach flexibility, Fitness/sit-ups, Reduced hazardous exposures, Frequency of hard braking (truck drivers), Lost time accidents, Workers Compensation claims/year, Workers Compensation rates, Workers Compensation costs/employee, Illness days, Days absent, MD visits, Health Expenses, Hospital admissions, Length of hospital stays, Health conditions costs	1 each	•				•					•	•			•	•		
Self-Reported Behaviors																		
Smoking (% quitting)	6	•	•				•		•		•				•			
Exercise frequency	3			•					•		•							
Sitting time	2												•	•				
Health risk age/risk factor calculations	2								•		•							
Fruit and vegetable intake	2					•	•											
Drinking alcohol frequency	2										•				•			
Self-reported health status	2									•					•			
Seat belt use	2										•				•			
Multi-vitamin consumption, Fat intake, Fat in food, Sugary snacks consumption, Sugary drink consumption, Fast foods eating frequency, % calories from fat in food consumed, Heavy drinking	1 each	•		•		•	•	•	•					•	•	•	•	•

Significantly Changed Measures	# measuring	Wellworks-2	MassBUILT	Healthy Directions	Eriksen et al. (2002)	PHLAME	Wellworks	Tsutsumi et al. (2009)	Peters and Carlson (1999)	Tveito and Eriksen (2009)	Bertera (1993),	Rasmussen et al. (2006)	Take-a-Stand	Alkhajah et al. (2012)	Dalton and Harris (1991)	SHIFT	Konradt et al. (2000)	Ott et al. (2009)
frequency, OSH programs at worksites, Standing time, Sit-to-stand transitions, Fatigue after exercise, Weight, Dietary understanding, Positive dietary behaviors, Healthy/wellness program participation, Nutritious eating program participation, Healthy behaviors, Hospital admissions reported, Seat belt - % using all/most of time, Risk of death, WHO health & work performance, Time management, Communication issues																		
Symptoms																		
Depression	2								•				•					
Pain, Work stress, Hypertension - uncontrolled – prevalence, Mental health symptoms, Fatigue, Tension, Confusion, State/Trait-curiosity, Overall mood, Ergonomic issues	1 each							•	•				•		•		•	
Beliefs and Supports																		
Health self-efficacy, Exercise self-efficacy, Stress management self-efficacy, Healthy nutrition self-efficacy, Healthy practices self-efficacy, Intention to change to become healthier, Perception of change in the environment/support, Perception of access to health care, Perception of social support, Safety climate, Social climate, Social support for nutritious diet, Social support for physical activity	1 each					•			•			•						
Total risk factors changed		**5**	**1**	**2**	**0**	**12**	**3**	**2**	**18**	**1**	**9**	**4**	**7**	**4**	**19**	**11**	**3**	**1**

Notes: The main PHLAME study design was ranked 1; the PHLAME OSH data analysis had a design rank of 2. Dalton and Harris (1991) had both a pilot and a company-wide implementation, so some results appear twice in the Appendix but only one time in Table 4; 10 changes were reported in the pilot and 9 were reported in the company-wide implementation.

Table 5. Changes in TWH and Focused Interventions with Comparable Outcome Measures (shaded studies are in Design Rank 1).

Measure	TWH Study	TWH Intervention Changes (and time outcomes were measured after the program began)	Focused Intervention Changes	Meta- or Systematic Analysis of focused Interventions
Weight	PHLAME	0.9 pound (O) *increase* in Team group, 1.2 pound (O) *increase* in MI group, 3.4 pound (O) *increase* in controls (all at 1 year)	No comparison located -	-
Weight	Peters and Carlson (1999)	3.96% reduction in overweight (O) members in intervention group (at 10 weeks)	No comparison located -	-
Weight	Bertera (1993)	1.05% *increase* in those over ideal weight (O) (at 2 years)	No comparison located -	-
Weight	Dalton and Harris (1991)	17% *increase* in overweight (S) participants (at 4 years)	No comparison located -	-
Weight	SHIFT	7.8 pound loss in intervention group (at 6 months)	6.5 pounds median weight loss	Archer et al. (2011) meta-analysis of 12 weight loss programs relying on weight loss competitions and incentives
Exercise	Healthy Directions	8% increase of intervention participants achieving at least 2.5 hours/week of physical activity (S) vs. 10% less in control group (at 18 months)	9.7% increase of intervention group participants achieving 2.5 hours of moderate exercise/week (at 1 year)	Muller-Riemenschneider, Reinhold, Nocon, and Willich (2008) systematic review of 39 programs designed to increase exercise; most effective of the 39 programs (Elley, Kerse, Arroll, & Robinson, 2003) listed here.
Exercise	Peters and Carlson (1999)	0.96 x/week increase of exercise (S) in intervention group vs. 0.26 x/week in Controls (at 10 weeks).	0.95x/week increase in exercise sessions per month (based on conversion of 3.90x/month).	Largest impact shown from King, Taylor, Haskell, and Debusk (1988) in Foster, Hillsdon, Thorogood, Kaur, and Wedatilake (2013) systematic review of 19 interventions.
Exercise	Bertera (1993)	14.53% of a low-exercise group began exercising more than 3 days/week (at 2 years).	15% increase of intervention participants meeting the target of 30 min of exercise 5 days/week.	Muller-Riemenschneider et al. (2008) systematic review of 39 programs designed to increase exercise. Most comparable study that was judged by the review to be of high quality was by Petrella, Koval, Cunningham,

				and Paterson (2003) who used physician counseling and activity 'prescriptions,' shown here.
Smoking	Wellworks-2	11.8% of hourly workers quit smoking in the HP+OSH group; 5.9% of the HP-only group quit smoking (at approximately 2 years)	4.2% higher abstinence rate in intervention groups than in controls	Myung, McDonnell, Kazinets, Seo, and Moskowitz (2009) meta-analysis of 22 web- or computer-based smoking cessation programs.
Smoking	MassBUILT	9.2% quit smoking (S) (I=26% vs. C=16.8%) (at 5 months); effect became non-significant at 11 months.	4.2% higher abstinence rate in intervention groups than in controls	Same as above.
Smoking	Wellworks	6% quit smoking (I = 15% vs. C = 9%) (at 6 months)	4.2% higher abstinence rate in intervention groups than in controls	Same as above.
Smoking	Peters and Carlson (1999)	3.25 less cigarettes smoked (time period not specified) in intervention participants vs. a decrease of 0.4 in controls (at 10 weeks), though significance disappeared at 3 months	No comparison located -	-
Smoking	Bertera (1993)	4.07% quit smoking (S) (at 2 years)	4.2% higher abstinence rate in intervention groups than in controls	Same as above.
Blood Pressure	Peters and Carlson (1999)	12.79 mm Hg reduction in systolic blood pressure (O) in intervention group; significant at 10 weeks but not at 3 months	4.44 mm Hg mean reduction in systolic blood pressure	Neter, Stam, Kok, Grobbee, and Geleijnse (2003) meta-analysis of 25 interventions using energy restriction (diet), increased physical activity, or both
Blood Pressure	Bertera (1993)	10.6 mm/Hg decrease in systolic blood pressure (O) High risk group (≥140 mm/HG) (at 2 years)	4.44 mm Hg reduction in systolic blood pressure	Same as above.
Blood Pressure	Dalton and Harris (1991)	6 mm Hg decrease in systolic blood pressure (O) (at 2 years)	4.44 mm Hg reduction in systolic blood pressure	Same as above.
Cholesterol	Peters and Carlson (1999)	21.5 mg/dl (0.56 mmol/L) reduction in total cholesterol (O) in intervention group; control group decreased 15 mg/dl (at 10 weeks)	0.17 mmol/L reduction in mean total cholesterol compared to groups with a high glycemic index diet	Kelly, Frost, Whittaker, and Summerbell (2004) meta-analysis of 17 focused interventions that produced a low glycemic diet
Cholesterol	Bertera (1993)	11.41 mg/dl (0.63 mmol/L) reduction	0.17 mmol/L reduction in total	Same as above.

		of total cholesterol (O) in high risk (≥221 mg/dl) group (~2 years)	cholesterol	
Cholesterol	Alkhajah et al. (2012)	0.26 mmol/L increase in fasting HDL cholesterol (O) (at 1 week & 13 weeks)	0.065 mmol/L mean increase in HDL cholesterol	Kodama et al. (2007) meta-analysis of 25 focused interventions that reported a minimal increase in exercise

Note: RCT = Randomized control trial; O = objective measure; S = self-report measure; I = intervention group; MI = motivational interview. Studies evaluated by a randomized design are highlighted gray in the left column.

Table 6. Summary of Results

Study Identifier Duration of intervention	Intervention Focus[1] - Industry	Theoretical Model	Intervention Program Participation[2] – Features[3]	Number of Significant Outcomes Changed and S/S+NS Ratio		Sustained?[1]	Intervention Cost Factors[4]				
Design Rank: 1				**S/NS**	**Ratio**		**C**	**T**	**S**	**E**	**I**
Wellworks-2: Sorensen et al. (2002); Sorensen et al. (2003); LaMontagne et al. (2004); Hunt et al. (2005); Stoddard et al. (2005) Duration: HP: 16 month intervention	HP+OSH mfg	Socio-ecological model	ME	5 / 10	0.33	Yes: HP and OSH at 16 months					
MassBUILT: Okechukwu et al. (2009); Okechukwu et al. (2011) Duration: 4 months; follow-up surveys at 1 and 6 months post-intervention	hp+ohs-S construction	Socio-ecological model	U – motivational interviewing; feedback	1 / 3	0.25	Yes: HP at 5 months No: HP at 10 months	•		•		
Healthy Directions: Hunt et al. (2003); E. Barbeau et al. (2004); E. M. Barbeau et al. (2004); Sorensen et al. (2005); Stoddard et al. (2005); Hunt et al. (2007) Duration: 18 months	HP+osh mfg	Socio-ecological model	ME	2 / 5	0.29	Yes: HP at 18 months	•		•		
Eriksen et al. (2002) Duration: 12 weeks	HP+OSH services			0 / 9		Not applicable			•		

PHLAME[5]: Moe et al. (2002); Elliot et al. (2007); MacKinnon et al. (2010); Ranby et al. (2011); K. S. Kuehl et al. (2013) Duration: Team (T): 11 weeks; Motivational Interviewing (MI): 4 individual meetings with optional following meetings at 6 and 10 months Workers' compensation study duration: Data from a 5 year period after baseline	HP+osh services	Social-Cognitive theory (for T) - Phenomenological theory (for MI)	E – team strategies; motivational interviewing	12 / 9	0.57	Yes: HP at 1 year No: HP at 3 years Yes: OSH at 5 years	T • M •	T M	T • M •	T M	T M
Tsutsumi et al. (2009) Duration: 16 months	HP+osh mfg		E – team strategies	2 / 4	0.33	Yes: HP at 1 year	•	•	•		
Peters and Carlson (1999) Duration: 10 weeks; follow-up at 3 months	HP+osh services		self-management; counseling; meditation/relaxation; self-directed behavior change; incentives for improvement	18 / 9	0.66	Yes: HP at 4 months	•				•
Tveito and Eriksen (2009) Duration: 12 month intervention; follow-up in 4 months after intervention ended	hp+OSH health care		E	1 / 9	0.10	Yes: HP at 9 months		•	•		
Design Rank: 2							**C**	**T**	**S**	**E**	**I**
Bertera (1990); Bertera (1993) Duration: 2 years	HP+OSH-W diversified		ME – self-directed behavior change; counseling; incentives for participation, improvement	9 / 5	0.64	Yes: HP and OSH at 2 years				•	•

Rasmussen et al. (2006) Duration: 3.5 years	hp+OSH mfg		ME – team strategies; incentives for participation	4 / 8	0.33	Yes: HP and OSH at 3.5 years	•				
Take-a-Stand: Pronk et al. (2012) Duration: 4 week intervention; data collected before (for 1 Week) and after (2 weeks)	hp+OSH health care			7 / 6	0.54	Yes: HP and OSH at 6 weeks				•	
Alkhajah et al. (2012) Duration: 12 weeks	hp+osh-S services			4 / 13	0.24	Yes: HP and OSH at 12 weeks				•	
Design Rank: 3							**C**	**T**	**S**	**E**	**I**
Dalton and Harris (1991) Duration: Data collected at about 2 years (pilot) and 4 years into the program	HP+OSH-W telecom		M – counseling; feedback; incentives for improvement	19 / 8	0.70	Yes: HP and OSH at 2 and 4 years				•	•
SHIFT: Olson et al. (2009); Wipfli et al. (2013) Duration: 6 months; follow-up of selected HP data at 30 months	HP+OSH transportation	Individual & social motivation	E - self-monitoring; motivational interviewing; feedback; incentives for participation, improvement; team competition	11 / 32	0.34	Yes: HP and OSH at 6 months; HP at 30 months	•	•			•
Design Rank: 4							**C**	**T**	**S**	**E**	**I**
Konradt et al. (2000) Duration: 11 months (+ 2 month follow-up)	hp+osh-S services		E – team strategies	3 / 0	1.0	Yes: HP and OSH at 13 months					
Design Rank: 5							**C**	**T**	**S**	**E**	**I**

Ott et al. (2009); Ott et al. (2010) Duration: Approximately 11 years	hp+osh-S mfg			1 / 8	0.11	Yes: HP at about 7.5 years	•					

[1] Intervention focus: HP = Health promotion (in caps = major program; lower case = limited in scope); OSH = traditional occupational safety and health program + work stress; W = Broad-based company-wide program; S = Specific endpoint or method addressed by the intervention.

[2] Intervention program participation: M = management participation, E = Employee participation; ME = management/employee boards; U = union participation.

[3] Features from Behavioral Processes and Consequences listed in Table 3

[4] Cost Factors: C = external consultants, T = externally-developed training, S = external trainers/intervention specialists, E = Significant equipment or materials provided, I = incentive programs

[5] PHLAME: T = Team; MI = Motivational Interviewing intervention methods