Systematic Review of the Impact of Worksite Wellness Programs

Karen Chan Osilla, PhD; Kristin Van Busum, MPA; Christopher Schnyer, MPP; Jody Wozar Larkin, BSN, MLIS; Christine Eibner, PhD; and Soeren Mattke, MD, DSc

Objectives: To analyze the impact of worksite wellness programs on health and financial outcomes, and the effect of incentives on participation.

Methods: Sources were PubMed, CINAHL & EconLit, Embase, Web of Science, and Cochrane for 2000-2011. We examined articles with comparison groups that assessed health-related behaviors, physiologic markers, healthcare cost, and absenteeism. Data on intervention, outcome, size, industry, research design, and incentive use were extracted.

Results: A total of 33 studies evaluated 63 outcomes. Positive effects were found for three-fourths of observational designs compared with half of outcomes in randomized controlled trials. A total of 8 of 13 studies found improvements in physical activity, 6 of 12 in diet, 6 of 12 in body mass index/weight, and 3 of 4 in mental health. A total of 6 of 7 studies on tobacco and 2 of 3 on alcohol use found significant reductions. All 4 studies on absenteeism and 7 of 8 on healthcare costs estimated significant decreases. Only 2 of 23 studies evaluated the impact of incentives and found positive health outcomes and decreased costs.

Conclusions: The studies yielded mixed results regarding impact of wellness programs on health-related behaviors, substance use, physiologic markers, and cost, while the evidence for effects on absenteeism and mental health is insufficient. The validity of those findings is reduced by the lack of rigorous evaluation designs. Further, the body of publications is in stark contrast to the widespread use of such programs, and research on the effect of incentives is lacking.

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For author information and disclosures, see end of text.

Employers have increasingly offered worksite wellness programs to employees and their families to decrease their cost of providing healthcare coverage and improve their employees' productivity. The goals of these programs are to promote healthy lifestyles and prevent disease with educational (eg, diet counseling) and motivational (eg, provision of incentives for lifestyle changes) approaches.[1] In 2009, 58% of US employers offered at least 1 wellness program.[2] In 2010, consumer participation in programs rose from 19% to 22%.[3] This trend is likely to accelerate, as the Patient Protection and Affordable Care Act emphasizes prevention.[4] The law provides wellness program start-up grants for small firms, establishes a 10-state demonstration program to reward program participation, and establishes technical assistance for evaluating programs. The law also gives employers greater latitude in rewarding staff for healthy lifestyles by raising the rewards for program participation. The limit, set at 20% of the cost of coverage, will increase to 30% in 2014, and the secretaries of Health and Human Services, Labor, and the Treasury will jointly have the authority to raise it as high as 50%.

Reflecting their growing importance, several reviews of worksite wellness programs and their components have been published. Baicker et al[5] assessed the impact of 32 programs on medical costs and absenteeism that were published since 1982 and found that programs typically return 3 dollars for every dollar invested, which is consistent with other research suggestive of savings.[1,6-9] Other studies have found positive effects as well,[10-12] including evidence for certain components of wellness programs (eg, health risk assessment).[13]

Despite these findings, a review is needed on the *current* impact of wellness programs to examine how employers have responded to current policy and programmatic priority changes. We conducted a systematic review of wellness programs to understand:

- What are the characteristics of the worksite wellness programs?
- What impact do programs have on outcomes?
- What types of incentives are provided for program uptake and what is their impact?

This review contributes to the evidence base in several ways. We considered outcomes beyond medical cost and absenteeism to include behavior

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change and health effects. Only studies with a comparison strategy were included, to maximize validity of the findings. We also limited our scope to studies about comprehensive programs that were published after 2000 to yield a more accurate reflection of current programs. Finally, we looked at the use of incentives for program uptake.

Take-Away Points

Because of the emphasis the Affordable Care Act places on worksite health promotion, employers have increasingly offered worksite wellness programs, but little research has evaluated the current impact of these programs.

- We analyzed a total of 33 studies published since 2000 that evaluated the characteristics, impact, and incentives of worksite wellness programs.
- Studies suggest mixed impact on health-related behaviors and cost, with insufficient evidence for effects on absenteeism and mental health.
- Lack of rigorous evaluation designs reduces the internal validity of these findings.

METHODS

Data Sources

We conducted a keyword search covering PubMed, CINAHL & EconLit (EBSCO), Embase, Web of Science, and Cochrane from January 2000 through June 2011 (see the Appendix). Additional articles were identified through reference searches of recent literature reviews or meta-analyses.

Article Selection

Articles were included if they had a control or other comparison group and evaluated outcomes of comprehensive worksite wellness programs (ie, multiple wellness components focused on health promotion or disease prevention). We excluded opinion and theory articles, reviews, articles without a comparison group, non-English language and non-US articles, articles published before 2000, and articles that focused exclusively on disease management.

Two investigators (KCO, KVB) independently evaluated articles for inclusion based on title and abstract review, and then full text review. A third investigator (SM or CS) served as tie breaker in case of discrepancy.

Data Extraction

We extracted type of intervention, setting, and research design from each study. Programs and worksites were classified by type, size, and industry.[14]

We categorized the quality of the design using methods adapted from previous meta-analyses[15,16]: controlled trials with random assignment, prospective studies with nonrandomly assigned comparison groups, and observational designs with internal comparison groups (eg, participants vs nonparticipants).

RESULTS

Identification of Evidence

We identified 1546 articles from our search and 9 through bibliography searches of review articles (Figure). We excluded 1492 upon title and abstract review. A total of 62 full-text articles were assessed for eligibility; 29 were not eligible (eg, noncomprehensive programs, international, no comparison), yielding a final sample of 33 articles.

Sample Characteristics

Of the 33 studies, 22 reported company size (Table 1); 8 studies were done in medium-sized companies, while only 1 reported on a small worksite. Of the 33 studies, 29 reported the industry. About half were conducted in companies that provided services, which is comparable to the distribution of industries in the overall economy.

Program modality varied substantially, as 31 studies reported multiple delivery methods (23 reported 3 or more). The most common modality was self-help or educational materials and/or individual coaching or counseling.

Program Outcomes

A total of 63 outcomes were evaluated between the 33 studies (Table 2). The most common were exercise (n = 13), diet (n = 12), and physiologic markers (n = 12). Others reported on healthcare cost (n = 8), smoking (n = 7), alcohol use (n = 3), absenteeism (n = 4), and mental health (n = 4). The majority of studies (64%) used self-reported data for at least 1 outcome. About three-fourths of the observational designs reported beneficial outcomes compared with about half of the randomized trials.

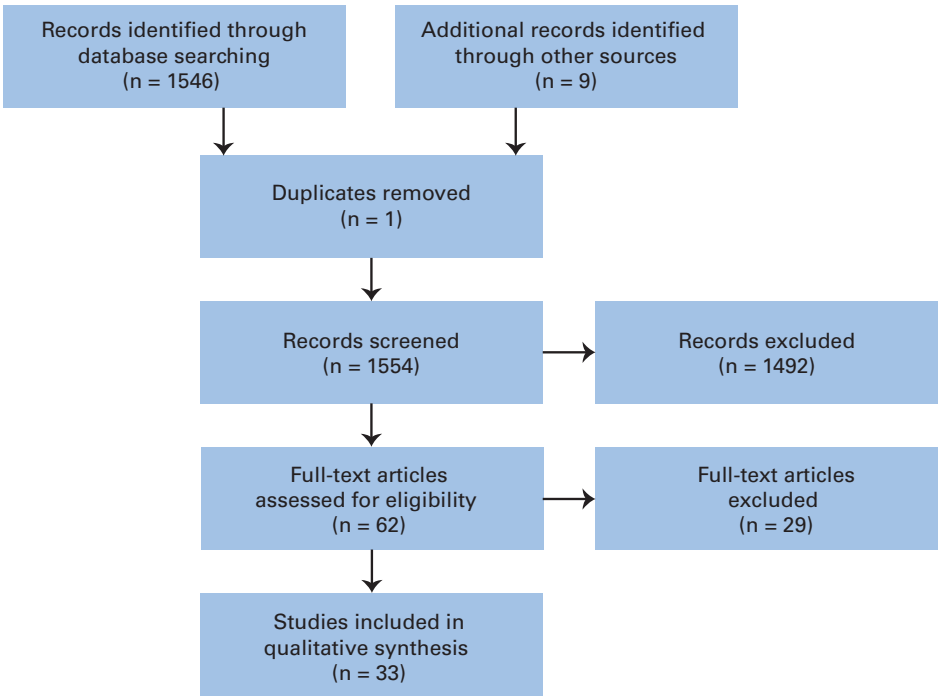
Program Impact

Table 3 provides a detailed description of the outcomes and data measured in each study.

Exercise. Thirteen studies evaluated exercise and 8 (62%) found improvements in physical activity. Of these 8 studies, 3 were randomized control trials (RCTs)[21,39,43] and 5 utilized a control group with nonrandom assignment[34] or observational designs.[25,27,31,41] All 4 that utilized observational designs showed positive effects on exercise, whereas only 3 of the 7 RCTs found a beneficial effect. Only 1 of these 3 RCTs had a follow-up period longer than a year and a sample size larger than 100.[21]

Of the 8 studies with positive effects, 4 showed substantial changes, such as employees being twice as likely to exercise[27]

Figure. Study Flow Diagram



and increasing walking by 103 minutes a week.[43] Two others had smaller effects[21,25] such as improved exercise frequency, but no improvements in aerobic activity.[21] Two studies did not report the magnitude of the impact.[34,41] Half of the 13 studies had follow-up periods of less than 1 year, and the maximum follow-up period was 4 years.

Diet. Of the 12 studies that evaluated diet, 6 (50%) found improvements in diet[21,22,26,27,34,41] including higher fruit and vegetable consumption and lower fat and energy intake. Of these 6, 3 utilized an RCT,[21,22,26] 2 of which had a follow-up period longer than a year.[21,49] One study had a nonrandom comparison group[41] and 2 had an observational design.[27,41] A total of 2 of the 3 studies with observational designs and 1 of the 2 studies with a nonexperimental comparison group found improvements in diet, while fewer than half of the studies with RCTs found significant effects. Overall, effects were small, such as an increase of 0.7 servings of fruits and vegetables per day[21] or an average of 0.2 fewer fast food meals per week.[26]

Physiologic Markers. Twelve studies evaluated physiologic markers such as body mass index (BMI), cholesterol levels, and blood pressure. Six of these found improvements in 1 or more outcomes, including BMI or weight,[19,31,34,41,44,45] diastolic blood pressure,[41] and body fat mass.[44] Effects included decreases in BMI by 0.04 kg/m^2 among program participants,[34] 4.3% reduction in BMI,[41] and 1% reduction of diastolic blood pressure.[41] Of these 6 studies, 3 used an RCT[19,44,45] and 3 used a nonexperimental comparison group[34] or an observational design.[31,41] None of the RCT studies showing a positive effect had a sample size larger than 100. The 6 studies that did not report a positive impact were RCTs (n = 3) and observational studies (n = 3).

Smoking. A total of 6 of 7 studies found higher quit rates[29,35,40,46] or less tobacco use.[27,41] Two found that approximately 10% more individuals in the intervention group quit smoking compared with the control group[29,40] and another reported participants were almost 4 times more likely to reduce smoking than nonparticipants.[27] All RCTs reported positive effects,[29,35,40,46] as did 2 observational studies.[27,41] Of the 4 RCT studies showing higher quit rates, 3 had a follow-up period longer than 1 year. Sample sizes in all studies ranged from about 420 to 1130 in each group.

Alcohol Use. Three studies evaluated alcohol use as an outcome using an RCT design. Two compared a motivational interviewing–based intervention with a no-treatment control group,[18,23] and 1 study evaluated a counseling-based treatment program compared with a no-counseling control group.[29] Of the 3 studies, 2 reported reductions in alcohol[18,23] such as decreased drinking on weekends and frequency of intoxication[23] and 0.4 fewer days of alcohol consumption per week.[18] One study found no impact,[29] which may be attributed to the small sample size and a 3-year follow-up.

Healthcare Cost. Eight studies evaluated the impact of wellness programs on healthcare cost and all but 1 study[17] found significant decreases. Effects included a reduction in direct medical

cost between $176 and $1539 per participant per year.[30,37,38] Other studies took a broader view and found $613 savings when including disability cost savings[47] and $180 savings when combining healthcare cost and absenteeism.[48] Of the 7 studies finding a cost reduction, only 1 study utilized an RCT, which had a follow-up period longer than a year.[37] The other studies utilized a nonrandom comparison group[30,32,36,38] or observational designs.[47,48] The study finding no impact on cost also had an observational design.[17]

Of the 8 studies, 5 conducted return on investment (ROI) analyses and found returns between $1.65 and $6.00 saved for every dollar invested.[30,36-38,48] These studies included the RCT,[37] 3 nonrandom control designs with a follow-up period between 4 and 7 years,[30,36,38] and an observational design with a 7-year follow-up.[48]

Absenteeism. Four studies evaluated absenteeism costs, as defined by the estimated cost of missed workdays. Each of these studies found significant effects, expressed as an ROI of $15.60 per dollar spent,[17] $1350 saved per employee in short-term disability costs,[27] 0.1% point risk reduction in illness days,[31] and $180 saved per participant per year when including healthcare cost.[48] All 4 studies used observational designs.

Mental Health. Four studies evaluated program impact on perceived mental

Table 1. Worksite and Wellness Program Characteristics

Characteristics	%
Company size[a]	
≥50 and ≤100 workers	5
>100 and ≤1000 workers	36
>1000 and ≤10,000 workers	27
>10,000 and ≤50,000 workers	23
>50,000 workers	9
Industry description[b,c]	
Services	48
Manufacturing	21
Trade/transportation	7
Government	14
More than 1 industry	10
Wellness program modality[d]	
Self-help and educational materials	85
Individual coaching or counseling	67
Group counseling or classes	52
Health risk assessment	39
Group activities and competitions	27
Web-based programs	24
Changes in physical environment	24
Fitness center access or membership	18

[a]Twenty-two studies reported company size.
[b]Heavy Industry (agriculture, forestry, fishing and hunting; mining, quarrying, and oil and gas extraction; utilities; construction); Manufacturing; Trade (wholesale; retail; transportation and warehousing); Services (information; finance and insurance; real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and support and waste management and remediation services; educational services; healthcare and social assistance; arts, entertainment, and recreation; accommodation and food services; other services [except public administration]); Government (federal, state, local).[14]
[c]A total of 29 studies reported industry type.
[d]These categories are not mutually exclusive as many programs had multiple types of modalities.

Table 2. Reported Outcomes of Wellness Program Evaluations

	All Evaluation Designs (N = 33)			Randomized Controlled Trial (n = 17)			Non-random Comparison Group (n = 6)			Observational Design (n = 10)		
Outcomes	**Total**	**Beneficial Effect**	**No Effect**	**Total**	**Beneficial Effect**	**No Effect**	**Total**	**Beneficial Effect**	**No Effect**	**Total**	**Beneficial Effect**	**No Effect**
Exercise	13	8	5	7	3	4	2	1	1	4	4	0
Diet	12	6	6	7	3	4	2	1	1	3	2	1
Physiologic markers	12	6	6	6	3	3	1	1	0	5	2	3
Smoking	7	6	1	4	4	0	0	0	0	3	2	1
Alcohol use	3	2	1	3	2	1	0	0	0	0	0	0
Healthcare costs	8	7	1	1	1	0	4	4	0	3	2	1
Absenteeism	4	4	0	0	0	0	0	0	0	4	4	0
Mental health	4	3	1	1	0	1	1	1	0	2	2	0
All outcomes	**63**	**42**	**21**	**29**	**16**	**13**	**10**	**8**	**2**	**24**	**18**	**6**

Table 3. Overview of Study Findings

Study	Sample Size (Experiment/ Comparison)	Outcomes	Modality	Longest Follow-up, Months	Principal Findings	Research Design
Aldana,[17] 2005	2671/3575	Healthcare costs, absenteeism	Self-help/educational materials, group counseling	24	**Healthcare costs:** No difference between groups **Absenteeism:** Program participants had 3 fewer missed workdays, translating to a 15.60 ROI	Observational design
Anderson,[18] 2002	82/73	Alcohol use	Individual counseling	6	**Alcohol use:** Program participants had decreased drinking frequency compared with nonparticipants (effect size = .55)	RCT
Barham,[19] 2011	21/24	Physiologic markers	Self-help/educational materials, group counseling, individual counseling	3	**Physiologic markers:** Program participants decreased weight (−2.3 kg vs +0.73 kg; $P<.001$), BMI ($P<.001$), and waist circumference ($P<.004$) compared with wait-list controls; changes not sustained at 12-month follow-up	RCT
Butterworth,[20] 2006	44/44	Diet, exercise, mental health	Individual counseling	3	**Diet and exercise:** No difference on Physical Composite Score between groups **Mental health:** Program participants improved Mental Health Composite Score by 3.45 points ($P<.05$); controls showed no change	Comparison with non-random assignment
Campbell,[21] 2002	362/298	Diet, exercise	Self-help/educational materials, individual counseling, Web	18	**Diet:** Program participants decreased fat intake (48.1-51 g) compared with controls (51.8-52.4 g, $P<.05$) and increased fruit and vegetable intake by 0.7 servings ($P<.05$) at 18 months **Exercise:** Program participants increased exercise (61%-68%) compared with controls (67%-61%, $P=.09$) at 6 months ($P<.05$)	RCT
Cook,[22] 2007	209/210	Diet, exercise, physiologic markers, mental health	Self-help/educational materials, Web	3	**Diet:** Program participants had improved attitudes about healthy diet ($P<.01$) and dietary readiness ($P<.01$) **Exercise:** No difference in physical activity **Physiologic markers:** No difference in weight between intervention and comparison groups **Mental health:** No difference in stress levels	RCT
Doumas,[23] 2008	(63 MI/60 WI)/73	Alcohol use	Self-help/educational materials, individual counseling, Web	1	**Alcohol use:** Participants in Web and motivational interviewing and Web-only had decreased weekend drinking, frequency of drinking to intoxication, and peak consumption compared with controls ($P<.05$) No difference between Web-only and Web + motivational interview	RCT

(Continued)

Table 3. Overview of Study Findings *(Continued)*

Study	Sample Size (Experiment/ Comparison)	Outcomes	Modality	Longest Follow-up, Months	Principal Findings	Research Design
Elberson,[24] 2001	54/320	Physiologic markers	Self-help/educational materials, individual counseling, group counseling, fitness center	12	**Physiologic markers:** No differences; both groups had improved cholesterol, triglycerides, and BMI	Observational design
Faghri,[25] 2008	32/28	Diet, exercise	Self-help/educational materials, individual counseling, HRA	6	**Exercise:** Program participants had increased readiness to change their exercise behavior (P <.05) **Diet:** No difference in readiness to change eating behavior between groups	Observational design
French,[26] 2010	2/2	Diet, exercise, physiologic markers	Individual counseling, group counseling, environment, group activities	18	**Diet:** Program participants had no change in fruit and vegetable consumption (2.2-2.2) compared with control sites (2.0-1.9) (95% CI 0.01-0.49 [P <.05]) **Exercise:** No difference in physical activity **Physiologic markers:** No group difference in BMI	RCT
Gold,[27] 2000	607/1134	Diet, exercise, physiologic markers, mental health, smoking	Self-help/educational materials, individual counseling, HRA	20-25	**Diet:** Program participants were 1.5 times as likely to practice healthy eating **Exercise:** Program participants had reduced risk scores compared with nonparticipants (5.17 vs 6.36, P <.01), were 2 times as likely to exercise, 1.7 times as likely to practice back care **Mental health:** Participants were 2 times as likely to practice stress management **Physiologic markers:** No differences in cholesterol levels **Smoking:** Program participants who used tobacco were 3.7 times more likely to reduce their use compared with nonparticipants	Observational design
Gosliner,[28] 2010	43/39	Diet, exercise	Self-help/educational materials, individual counseling, group activities, HRA	9	**Diet and exercise:** There were no differences in health behaviors between groups	RCT
Heirich,[29] 2000	483/424	Smoking, alcohol use	Individual counseling, group counseling	3 years	**Smoking:** 65% of intervention group quit smoking compared with 53% of comparison group (P <.01) **Alcohol use:** There were no differences in alcohol use between groups	RCT

(Continued)

Table 3. Overview of Study Findings *(Continued)*

Study	Sample Size (Experiment/ Comparison)	Outcomes	Modality	Longest Follow-up, Months	Principal Findings	Research Design
Henke,[30] 2011	32,478/473,213 (matched comparison)	Healthcare costs	Self-help/educational materials, fitness center, Web, changes in physical environment, individual counseling, HRA	6 years	**Healthcare costs:** Yielded an ROI of $1.88-$3.92 per person; total medical costs were $565 lower per person per year	Comparison with non-random assignment
Herman,[31] 2006	67,324/59,048	Exercise, absenteeism, smoking, physiologic markers	Self-help/educational materials, individual counseling, Web, group activities, HRA	12	**Exercise:** Participants in incentive group showed significant risk reductions for physical inactivity (P <.05) **Absenteeism:** Participants in incentive group showed significant risk reduction in illness days (P <.05) **Smoking:** There were no differences in smoking between groups **Physiologic markers:** Participants in incentive group had decreased risk for high body weight compared with intervention-only group (P <.05)	Observational design
Hochart,[32] 2011	9637/3800	Healthcare cost	Self-help/educational materials, individual counseling, Web, group counseling	3 years	**Healthcare costs:** Smaller increases in overall medical and emergency department costs per month than nonparticipating employer groups	Comparison with non-random assignment
Lowe,[33] 2010	47/49	Diet, physiologic markers	Self-help/educational materials, group counseling, environment	18	**Diet:** There was no difference in energy intake between groups **Physiologic markers:** There was no difference in BMI or cholesterol levels between groups	RCT
MacKinnon,[34] 2010	MI 202/ team 234/ control 163	Diet, exercise, physiologic markers	Self-help/educational materials, group counseling, Web, group activities	4 years	**Diet:** Participants in the team-centered peer-taught curriculum had no long-term effects, but had increased fruit and vegetable consumption (1.45, P <.05) **Physiologic markers:** Participants in team-centered curriculum had lower BMIs (–.38, P <.05) **Exercise:** Participants in the individual support group had improved aerobic fitness (mean difference = 1.98) and exercise habits (.61)	Comparison with non-random assignment
McMahon,[35] 2000	280 self-help/ 281 incentive/ 283 group	Smoking	Self-help/educational materials, group counseling	24	**Smoking:** Program participants had increased partner support, which facilitated higher quit rates compared with a comparison group (P <.01)	RCT
Merrill,[36] 2011	13,790/5708	Healthcare cost	Self-help/educational materials, group counseling, group activities, HRA	5 years	**Healthcare costs:** Yielded an ROI of $3.85 per person over 3 months in prescription drug and medical costs savings	Comparison with non-random assignment
Milani,[37] 2009	185/154	Healthcare costs	Self-help/educational materials, individual counseling, group counseling, group activities, fitness center, HRA	12	**Healthcare costs:** Decreased annual claim costs by 48% translating to a 6-fold ROI	RCT

(Continued)

Table 3. Overview of Study Findings *(Continued)*

Study	Sample Size (Experiment/ Comparison)	Outcomes	Modality	Longest Follow-up, Months	Principal Findings	Research Design
Naydeck,[38] 2008	1890/1890 (matched comparison)	Healthcare Costs	Self-help/educational materials, individual counseling, group counseling, group activities, Web, environment, fitness center, HRA	4 years	**Healthcare costs:** Yielded an ROI of $1.65 per person compared with risk-matched nonparticipants; healthcare expenses were $176 lower per person per year and inpatient expenses were lower by $182 per person	Comparison with non-random assignment
Nichols,[39] 2000	32/32	Exercise	Group counseling, fitness center	9	**Exercise:** Program participants increased overall energy expenditure (effect size = .98) compared with a comparison group (P <.001)	RCT
Okechukwu,[40] 2009	1044/897	Smoking	Self-help/educational materials, group counseling, environment	6-9	**Smoking:** Program participants had higher 1-month quit rates than controls (26% vs 16.8%, P <.05); no significant group difference in quit rates at 6 months	RCT
Ozminkowski,[41] 2000	3508/4432	Diet, exercise, physiologic markers, smoking, mental health	Self-help/educational materials, individual counseling, HRA	24	**Diet and exercise:** Program participants had a greater reduction in probability of being high risk; the net impact was 4.3% reduction in high-risk status overall, 8.7% reduction for exercise habits, and .6% fat, .9% salt, and .7% fiber intake (P <.05) **Smoking:** 1.2% risk reduction for cigarette use (P <.05) **Physiologic markers:** 4.3% risk reduction for BMI (P <.05) and 1% risk for diastolic blood pressure (P <.05) **Mental health:** 6.1% risk reduction for stress (P <.05)	Observational design
Pescatello,[42] 2001	198/80	Physiologic markers	Self-help/educational materials, individual counseling, group counseling, HRA	4	**Physiologic markers:** No differences on cardiovascular health indicators	Observational design
Purath,[43] 2004	134/153	Exercise	Self-help/educational materials, individual counseling	1.5	**Exercise:** Program participants increased weekend activity (.77 hours) compared with controls (.36 hours, P <.01) and total minutes walked per week (103.1) compared with controls (76.2, P <.001)	RCT
Racette,[44] 2009	68/55	Physiologic markers	Self-help/educational materials, group and individual counseling, environment, group activities, HRA	12	**Physiologic markers:** Program participants had decreased risk for metabolic syndrome (38%-25%) compared with controls (29%-18%; P <.07) and decreased BMI (P <.02) and fat mass (P <.04)	RCT
Serxner,[9] 2001	450/1166	Absenteeism	Self-help/educational materials, group counseling, fitness center, HRA	24	**Absenteeism:** Program participants had fewer days lost (29.2-27.8) compared with nonparticipants (33.2-38.1; P <.01)	Observational design

(Continued)

Table 3. Overview of Study Findings *(Continued)*

Study	Sample Size (Experiment/ Comparison)	Outcomes	Modality	Longest Follow-up, Months	Principal Findings	Research Design
Siegel,[45] 2010	8/8	Diet, exercise, physiologic markers	Self-help/educational materials, environment, individual counseling	3 years	**Diet:** No difference in fruit and vegetable consumption **Exercise:** No difference in weekly physical activity **Physiologic markers:** Schools that participated in an obesity intervention reduced their average BMI (28.54-28.40) by .04 kg/m^2 and control schools increased their BMI (27.56-27.98) by 0.37 kg/m^2 (P <.05); no differences in waist-hip ratio	RCT
Sorensen,[46] 2003	9019/7327	Diet, smoking	Self-help/educational materials, group counseling, environment, group activities, individual counseling	24	**Diet:** There were no differences in fruit and vegetable consumption between groups **Smoking:** Program participants had more than double the quit rate of smoking compared with individuals receiving health promotion alone (OR = 2.13, P <0.05)	RCT
Stave,[47] 2003	1275/2687	Healthcare costs	Self-help/educational materials, HRA	4 years	**Healthcare costs:** $613 savings per participant compared with nonparticipants	Observational design
Yen,[48] 2010	2036/717	Healthcare costs, absenteeism	Self-help/educational materials, HRA	7 years	**Healthcare costs and absenteeism:** Yielded a savings of $180 per participant per year (P <.005), which translates to a cumulative ROI of 1.57 over 7 years	Observational design

BMI indicates body mass index; CI, confidence interval; MI, motivational interviewing; HRA, health risk appraisal; OR, odds ratio; RCT, randomized controlled trial; ROI, return on investment; WI, Web-based feedback.

health[20] and stress.[22,27,41] Butterworth et al[20] used a nonrandom control design and found that employees receiving the intervention improved their mental health by 3 points on the 12-Item Short Form Health Survey, while control participants had no improvement. Cook et al[22] used an RCT and found no significant differences on stress. Ozminkowski et al[41] used an observational design and found that individuals receiving the intervention had a 6.1% risk reduction for stress. An observational study[27] found that individuals in a telephone-based health promotion program were 2 times as likely to practice stress management compared with nonparticipants.

Use of Incentives

Incentives to encourage program enrollment and participation were common; 23 (70%) of the studies offered incentives (Table 4). A total of 10 studies offered incentives for participation, 5 for survey completion, 2 for program enrollment, and 6 for a combination of enrollment, participation, and/or survey completion. Two evaluated the impact of incentives on health-related standards. Herman et al[31] compared the impact of a virtual wellness program on participants who received a $150 incentive for logging minutes exercised compared with those who did not. Compared with the nonincentivized group, incentivized participants had improvements in health-related behaviors and body weight but not smoking rates. Merrill et al[36] found offering financial incentives encouraged employees to participate in wellness activities, but they did not include a nonincentivized comparison group.

DISCUSSION

We analyzed a total of 33 studies published since 2000. Our goals were to examine the characteristics of current wellness programs, evaluate the impact these programs had on outcomes such as health-related behaviors and medical costs, and assess the use and potential impact of program incentives.

Most programs were conducted in the services industry and in medium-sized to large businesses. Most programs utilized

Table 4. Incentives Used in Wellness Programs

Incentive	Description
Program enrollment	
Cook,[22] 2007	$50 to participate plus a $500 raffle drawing
Ozminkowski,[41] 2000	$10 toward medical benefits
Participation	
Aldana,[17] 2005	Received a (unspecified) prize for maintaining weight
Gosliner,[28] 2010	Incentives (unspecified) were offered to those who reached walking milestone
Herman,[31] 2006	$150 cash rebate for participating and logging minutes of activity for a minimum of 20 minutes per day 3 times a week
McMahon,[35] 2000	$1 a day for abstinence (up to $175)
Merrill,[36] 2011	Financial incentives (unspecified amount) for modifying or maintaining specific health behaviors
Milani,[37] 2009	Vacation days and free health-related premiums
Naydeck,[38] 2008	Half day off work if participated in High Mark Program
Racette,[44] 2009	Kitchen gadgets and exercise gear
Serxner,[9] 2001	Up to $450 reimbursement for fitness memberships or classes
Stave,[47] 2003	Rewards (<$50.00) for attendance and healthy behaviors
Survey completion	
Anderson,[18] 2002	$15 for baseline and follow-up, respectively
Campbell,[21] 2002	Pencils, cups, coupons, etc; women who completed outside of work hours received $5
Doumas,[23] 2008	Two movie tickets or $10 at baseline and follow-up
Lowe,[33] 2010	$25 for each completed assessment
Purath,[43] 2004	$5 for second follow-up
Combination of incentives	
French,[26] 2010	$2500-$6000 to sites for participation $10 and $20 for completing the dietary recall and weight/height measurement
Hochart,[32] 2011	Incentives varied across program groups; examples include $85 for screening, HRA, and 1 other wellness program, $50 cash, $10/month premium differential, personal day, drawing for prizes
Okechukwu,[40] 2009	Entered in raffle for cash prize for completing 7 of 8 counseling sessions $10 for completing surveys
Pescatello,[42] 2001	$100-$150 for participating; merchandise for completing survey
Siegel,[45] 2010	$3500 stipend for intervention; control sites received $1000 at baseline and $1000 at end of program Gift certificates were offered for survey and participation Cash prizes for high participation (unspecified amount)
Yen,[48] 2010	Up to $300 in cash for completing depending on engagement Bonus drawing for an additional $300 for those who met criteria (assessment, action, healthy behavioral standards) $50 cash incentive for completion of HRA and self-report

HRA indicates health risk appraisal.

self-help and educational materials, and focused on improving health-related behaviors like diet and exercise. Consistent with previous research,[1,6-12] we found that studies mostly report positive impact on outcomes, but only half of these studies utilized an RCT design. Finally, we found that 70% of the programs offered incentives, but only 2 evaluated the impact of these incentives on health behavior outcomes and participation.[31,36]

Wellness programs were multifaceted in their delivery and evaluation. It is common for programs to use a combination of self-help and counseling to target several health behaviors.[49] All but 2 studies had multiple delivery methods and

more than half evaluated several outcomes. Combinations of approaches and outcomes were too heterogeneous to detect patterns by outcome. Future research is needed comparing the impact of different types of approaches or modalities (eg, Web vs printed materials).

While most studies found improved outcomes, our results confirm the concern that programs are often not evaluated with strong research designs.[50] When evaluations used observational designs, positive effects were found for three-fourths of the outcomes, whereas positive effects were found for only about half of the outcomes evaluated with RCTs. Without an RCT design, a causal effect between the program and outcome cannot be drawn reliably, and nonexperimental designs are more prone to selection bias. Additional limitations of these studies include small sample sizes and short follow-up periods. Only 2 studies had more than 120,000 participants, while others had as few as 50 to 2000 participants. Follow-up was 2 years or less for 70% of the studies, and studies with shorter follow-up tended to show more positive results. For example, 19 of the 29 studies (66%) that reported at least 1 significant finding had follow-up assessments of 2 years or less.[9,17-23,25,26,31,35,37,39-41,43,44,46] Use of self-reported findings in 21 of the 33 studies may also impact validity, especially if participants were aware of program assignment.

Fifty-five percent of the studies focused on programs that targeted health-related behaviors. About half found improved diet- and exercise-related outcomes, but the effects were small, especially for dietary behavior, or not reported explicitly. Further, fewer than half of RCTs on diet and exercise reported favorable findings. Studies on substance use mainly focused on tobacco use as opposed to alcohol or drug use. While all 3 studies evaluating alcohol outcomes were RCTs, very few studies evaluated programs for early substance use problems.[18,51] Of the 7 tobacco studies with RCTs, 6 had reasonably large samples and meaningful effects. However, these positive effects should be interpreted with caution because findings were either not significant at longer follow-up[40] or not for all employees (eg, hourly and not salaried workers).[46] Studies typically used nonparticipants as a comparison, increasing the risk of selection bias, although 1 study used propensity score matching to adjust for this bias.[30] Future studies should control for observable differences between wellness program participants and nonparticipants, and use additional calculations to interpret the strength of program impact.

Despite the volume of studies on healthcare cost and absenteeism published prior to 2000,[5] only 8 studies met our criteria. Most studies were excluded due to the lack of a comparison strategy. Only 5 studies provided a calculation of ROI, in contrast to previous research[1,5-9] that found a solid body of literature providing evidence for cost savings. This is important because those reviews included predominately older studies, and it is unclear whether the type of interventions and scale of opportunities are comparable to what is observed today. Only 1 of the 7 studies showing costs savings utilized an RCT, making it difficult to determine whether reduced costs and associated behavior change can be fully attributed to the programs. Further, evidence of program impact on absenteeism is limited because all 4 studies used observational designs.

To summarize, the published studies included in our review since 2000 provide mixed evidence for a positive impact of workplace wellness programs on health-related behaviors, substance use, physiologic markers, and healthcare cost, and there is insufficient evidence for effects on absenteeism and mental health. Use of weaker evaluation designs in more than half of the studies limits the strength of the evidence.

We found that incentives were offered in 70% of the studies, but only 2 studies evaluated the impact of incentives on participation and outcomes and 1 of them did not have a nonincentivized comparison group. No studies evaluated unintended consequences of incentives. Thus, the literature does not allow us to assess unintended effects of incentives (eg, on availability and affordability of coverage). Typical incentive amounts were small, ranging from $5 to $150, and some programs tiered incentives depending on level of engagement. Those amounts are well below incentive levels that are commonly used today, which are typically $200 to $400 per person per year.[52] Further, companies do not appear to be offering incentives close to the ceiling amount specified by the HIPAA Nondiscrimination Requirements.[53-55] Further research is needed on the effect of different levels of incentives on outcomes and health behaviors.

Our study has several limitations. First, we included only English-language studies and their chosen outcomes published in peer-reviewed journals, which may lead to bias because successful interventions are more likely to be published. Second, it is difficult to generalize our conclusions because wellness programs were very heterogeneous, outcomes were not systematically operationalized, and calculations of effect sizes were not consistently reported. Lastly, many studies relied on self-report with the potential of differential recall and reporting.

In conclusion, published evaluations of worksite wellness programs yielded mixed results. The number of publications that met our inclusion criteria is in stark contrast to the widespread use of such programs. Recent industry surveys indicate that employers plan to continue expanding their use of wellness programs.[56] Thus, a dynamic and innovative industry appears to have outpaced the underlying evidence, a phenomenon already observed for disease management programs.[57] Given the great interest in these programs and the

emphasis the Affordable Care Act places on worksite health promotion, further research is needed. Future studies will need strong evaluation designs, sufficient follow-up, and adequate power to detect meaningful differences. Lastly, better evidence is needed to understand the impact of incentives for program participation, behavior change, and risk factor reduction.

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Author Affiliations: From RAND (KCO), Santa Monica, CA: RAND (KVB, CS, SM), Boston, MA; RAND (JWL), Pittsburgh, PA; RAND (CE), Arlington, VA.

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Address correspondence to: Soeren Mattke, MD, DSc, RAND Corporation, 20 Park Plaza, Suite 720, Boston, MA 02116. E-mail: Mattke@rand.org.

REFERENCES

1. Goetzel RZ, Ozminkowski RJ. The health and cost benefits of work site health-promotion programs. *Annu Rev Public Health.* 2008;29: 303-323.

2. Kaiser Family Foundation, Health Research & Educational Trust. *Employer Health Benefits 2009 Annual Survey.* http://ehbs.kff.org/2009.html. Accessed January 17, 2012.

3. Keckly P, Hoffman M. *2010 Survey of Health Care Consumers: Key Findings, Strategic Implications.* Washington, DC: Deloitte Center for Health Solutions; 2010.

4. Koh H, Sebelius K. Promoting prevention through the Affordable Care Act. *N Engl J Med.* 2010;363(14):1296-1299.

5. Baicker K, Cutler D, Song Z. Workplace wellness programs can generate savings. *Health Aff (Millwood).* 2010;29(2):304-311.

6. Aldana SG. Financial impact of health promotion programs: a comprehensive review of the literature. *Am J Health Promot.* 2001;15(5): 296-320.

7. Chapman LS; American Journal of Health Promotion Inc. Meta-evaluation of worksite health promotion economic return studies: 2005 update. *Am J Health Promot.* 2005;19(6):1-11.

8. Golaszewski T. Shining lights: studies that have most influenced the understanding of health promotion's financial impact. *Am J Health Promot.* 2001;15(5):332-340.

9. Serxner S, Gold D, Anderson D, Williams D. The impact of a worksite health promotion program on short-term disability usage. *J Occup Environ Med.* 2001;43(1):25-29.

10. Pelletier K. A review and analysis of the clinical- and cost-effectiveness studies of comprehensive health promotion and disease management programs at the worksite: 1998-2000 update. *Am J Health Promot.* 2001;16(2):107-116.

11. Pelletier K. A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1993-1995 update. *Am J Health Promot.* 1996;10(5):380-388.

12. Stokols D, Pelletier K, Fielding J. Integration of medical care and worksite health promotion. *JAMA.* 1995;273(14):1136-1142.

13. Soler RE, Leeks KD, Razi S, et al; Task Force on Community Preventive Services. A systematic review of selected interventions for worksite health promotion: the assessment of health risks with feedback. *Am J Prev Med.* 2010;38(2)(suppl):S237-S262.

14. US Census Bureau. North American Industry Classification System. http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007. Accessed January 4, 2010.

15. Lundahl B, Kunz C, Brownell C, Tollefson D, Burke B. A meta-analysis of motivational interviewing: twenty-five years of empirical studies. *Research on Social Work Practice.* 2010;20(2):137-160.

16. Jadad A, Moore R, Carroll D, et al. Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Control Clin Trials.* 1996;17(1):1-12.

17. Aldana SG, Merrill RM, Price K, Hardy A, Hager R. Financial impact of a comprehensive multisite workplace health promotion program. *Prev Med.* 2005;40(2):131-137.

18. Anderson BK, Larimer ME. Problem drinking and the workplace: an individualized approach to prevention. *Psychol Addict Behav.* 2002; 16(3):243-251.

19. Barham K, West S, Trief P, Morrow C, Wade M, Weinstock RS. Diabetes prevention and control in the workplace: a pilot project for county employees. *J Public Health Manag Pract.* 2011;17(3):233-241.

20. Butterworth S, Linden A, McClay W, Leo MC. Effect of motivational interviewing-based health coaching on employees' physical and mental health status. *J Occup Health Psychol.* 2006;11(4):358-365.

21. Campbell MK, Tessaro I, DeVellis B, et al. Effects of a tailored health promotion program for female blue-collar workers: health works for women. *Prev Med.* 2002;34(3):313-323.

22. Cook RF, Billings DW, Hersch RK, Back AS, Hendrickson A. A field test of a web-based workplace health promotion program to improve dietary practices, reduce stress, and increase physical activity: randomized controlled trial. *J Med Internet Res.* 2007;9(2):e17.

23. Doumas DM, Hannah E. Preventing high-risk drinking in youth in the workplace: a web-based normative feedback program. *J Subst Abuse Treat.* 2008;34(3):263-271.

24. Elberson KL, Daniels KK, Miller PM. Structured and nonstructured exercise in a corporate wellness program: a comparison of physiological outcomes. *Outcomes Manag Nurs Pract.* 2001;5(2):82-86.

25. Faghri PD, Blozie E, Gustavesen S, Kotejoshyer R. The role of tailored consultation following health-risk appraisals in employees' health behavior. *J Occup Environ Med.* 2008;50(12):1378-1385.

26. French SA, Harnack LJ, Hannan PJ, Mitchell NR, Gerlach AF, Toomey TL. Worksite environment intervention to prevent obesity among metropolitan transit workers. *Prev Med.* 2010;50(4):180-185.

27. Gold DB, Anderson DR, Serxner SA. Impact of a telephone-based intervention on the reduction of health risks. *Am J Health Promot.* 2000;15(2):97-106.

28. Gosliner WA, James P, Yancey AK, Ritchie L, Studer N, Crawford PB. Impact of a worksite wellness program on the nutrition and physical activity environment of child care centers. *Am J Health Promot.* 2010; 24(3):186-189.

29. Heirich M, Sieck CJ. Worksite cardiovascular wellness programs as a route to substance abuse prevention. *J Occup Environ Med.* 2000;42(1):47-56.

30. Henke RM, Goetzel RZ, McHugh J, Isaac F. Recent experience in health promotion at Johnson & Johnson: lower health spending, strong return on investment. *Health Aff (Millwood).* 2011;30(3):490-499.

31. Herman CW, Musich S, Lu C, Sill S, Young JM, Edington DW. Effectiveness of an incentive-based online physical activity intervention on employee health status. *J Occup Environ Med.* 2006;48(9):889-895.

32. Hochart C, Lang M. Impact of a comprehensive worksite wellness program on health risk, utilization, and health care costs. *Popul Health Manag.* 2011;14(3):111-116.

33. Lowe MR, Tappe KA, Butryn ML, et al. An intervention study targeting energy and nutrient intake in worksite cafeterias. *Eat Behav.* 2010;11(3):144-151.

34. MacKinnon DP, Elliot DL, Thoemmes F, et al. Long-term effects of a worksite health promotion program for firefighters. *Am J Health Behav.* 2010;34(6):695-706.

35. McMahon SD, Jason LA. Social support in a worksite smoking intervention: a test of theoretical models. *Behav Modif.* 2000;24(2): 184-201.

36. Merrill RM, Hyatt B, Aldana SG, Kinnersley D. Lowering employee health care costs through the Healthy Lifestyle Incentive Program. *J Public Health Manag Pract.* 2011;17(3):225-232.

37. Milani RV, Lavie CJ. Impact of worksite wellness intervention on cardiac risk factors and one-year health care costs. *Am J Cardiol.* 2009;104(10):1389-1392.

38. Naydeck BL, Pearson JA, Ozminkowski RJ, Day BT, Goetzel RZ. The impact of the highmark employee wellness programs on 4-year healthcare costs. *J Occup Environ Med.* 2008;50(2):146-156.

39. Nichols JF, Wellman E, Caparosa S, Sallis JF, Calfas KJ, Rowe R. Impact of a worksite behavioral skills intervention. *Am J Health Promot.* 2000;14(4):218-221, ii.

40. Okechukwu CA, Krieger N, Sorensen G, Li Y, Barbeau EM. Mass-Built: effectiveness of an apprenticeship site-based smoking cessation intervention for unionized building trades workers. *Cancer Causes Control.* 2009;20(6):887-894.

41. Ozminkowski RJ, Goetzel RZ, Smith MW, Cantor RI, Shaughnessy A, Harrison M. The impact of the Citibank, NA, health management program on changes in employee health risks over time. *J Occup Environ Med.* 2000;42(5):502-511.

42. Pescatello LS, Murphy D, Vollono J, Lynch E, Bernene J, Costanzo D. The cardiovascular health impact of an incentive worksite health promotion program. *Am J Health Promot.* 2001;16(1):16-20.

43. Purath J, Miller AM, McCabe G, Wilbur J. A brief intervention to increase physical activity in sedentary working women. *Can J Nurs Res.* 2004;36(1):76-91.

44. Racette SB, Deusinger SS, Inman CL, et al. Worksite Opportunities for Wellness (WOW): effects on cardiovascular disease risk factors after 1 year. *Prev Med.* 2009;49(2-3):108-114.

45. Siegel JM, Prelip ML, Erausquin JT, Kim SA. A worksite obesity intervention: results from a group-randomized trial. *Am J Public Health.* 2010;100(2):327-333.

46. Sorensen G, Stoddard AM, LaMontagne AD, et al. A comprehensive worksite cancer prevention intervention: behavior change results from a randomized controlled trial (United States). *J Public Health Policy.* 2003;24(1):5-25.

47. Stave GM, Muchmore L, Gardner H. Quantifiable impact of the contract for health and wellness: health behaviors, health care costs, disability, and workers' compensation. *J Occup Environ Med.* 2003; 45(2):109-117.

48. Yen L, Schultz AB, Schaefer C, Bloomberg S, Edington DW. Long-term return on investment of an employee health enhancement program at a Midwest utility company from 1999 to 2007. *International Journal of Workplace Health Management.* 2010;3(2):79-96.

49. Goetzel R, Shechter D, Ozminkowski R, Marmet P, Tabrizi M, Roemer E. Promising practices in employer health and productivity management efforts: findings from a benchmarking study [published correction appears in *J Occup Environ Med.* 2007;49(5):583]. *J Occup Environ Med.* 2007;49(2):111-130.

50. Pelletier K. A review and analysis of the clinical and cost-effectiveness studies of comprehensive health promotion and disease management programs at the worksite: update VI 2000-2004. *J Occup Environ Med.* 2005;47(10):1051-1058.

51. Webb MS, Smyth KA, Yarandi H. A progressive relaxation intervention at the worksite for African-American women. *J Natl Black Nurses Assoc.* 2000;11(2):1-6.

52. Linnan L, Bowling M, Childress J, et al. Results of the 2004 National Worksite Health Promotion Survey. *Am J Public Health.* 2008;98(8): 1503-1509.

53. Capps K, Harkey J. *Employee Health & Productivity Management Programs: The Use of Incentives.* Lyndhurst, NJ: IncentOne; June 2008.

54. National Business Group on Health. *Large Employers' 2011 Health Plan Designs: Survey Report.* Published August 2010.

55. PricewaterhouseCoopers. *PwC Health and Well-Being Touchstone Survey Results.* May 2009.

56. Integrated Benefits Institute. *More Than Health Promotion: How Employers Manage Health and Productivity.* Published January 2010.

57. Mattke S, Seid M, Ma S. Evidence for the effect of disease management: is $1 billion a year a good investment? *Am J Manag Care.* 2007; 13(12):670-676. ■

Appendix. Search Strategies

Dates: January 2000–June 2011
PUBMED
employ*[ti] OR workplace[ti] OR worksite[ti] OR corporate[ti] OR organizational[ti] OR business[ti]
AND
wellness[ti] OR health[ti] OR prevent*[ti] OR intervention[ti]
AND
productivity[tiab] OR absen*[tiab] OR impact[tiab] OR presenteeism[tiab] OR outcome[tiab] OR incentive[tiab] OR "return on investment"[tiab] OR efficacy[tiab] OR effect*[tiab]
AND
(review OR (meta-analysis OR meta-anal* OR meta-anal*)
OR
(randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized controlled trials[mh] OR random allocation[mh] OR double-blind method[mh] OR single-blind method[mh] OR clinical trial[pt] OR clinical trials[mh] OR ("clinical trial"[tw] OR ((singl*[tw] OR doubl*[tw] OR trebl*[tw] OR tripl*[tw] AND (mask*[tw] OR blind*[tw])) AND (mask*[tw] OR blind*[tw])) OR ("latin square"[tw] OR placebos[mh] OR placebo*[tw] OR random*[tw] OR research design [mh:noexp] OR comparative study[pt] OR evaluation studies[pt] OR follow-up studies [mh] OR prospective studies [mh] OR cross-over studies[mh] OR control*[tw] OR prospective*[tw] OR volunteer[tw]))
Limited to English Language
CINAHL & EconLit (EBSCO)
TI employ* OR TI workplace OR TI worksite OR TI corporate OR TI organizational OR TI business
AND
TI wellness OR TI health OR TI prevent* OR TI intervention
AND
(TI productivity OR TI absentee* OR TI impact OR TI presenteeism OR TI efficacy OR TI effect*) OR (AB productivity OR AB absentee* OR AB impact OR AB presenteeism OR AB efficacy OR AB effect* AB "return on investment")
AND publication type: journal article, practice guideline, research, review, systematic review
Embase
employ*:ti OR workplace:ti OR worksite:ti OR corporate:ti OR organizational:ti OR business:ti
AND
wellness:ti OR health:ti OR prevent*:ti OR intervention:ti
AND
Productivity:ti,ab OR absen*:ti,ab OR impact:ti,ab OR presenteeism:ti,ab OR outcome:ti,ab OR incentive:ti,ab OR "return on investment":ti,ab OR efficacy:ti,ab OR effect*:ti,ab
Limited [English]/lim
Web of Science
TI=employ* OR TI=workplace OR TI=worksite OR TI=corporate OR TI=organizational OR TI=business
AND
TI=wellness OR TI=health OR TI=prevent* OR TI=intervention
AND
TS=productivity OR TS=absen* OR TS=impact OR TS=presenteeism OR TS=outcome OR TS=incentive OR TS="return on investment" OR TS=efficacy OR TS=effect*
AND
NOT Document Type=(MEETING ABSTRACT OR BOOK REVIEW OR CORRECTION OR EDITORIAL MATERIAL OR LETTER OR NEWS ITEM OR PROCEEDINGS PAPER)
Limited to English Language
Cochrane
employ*:ti OR workplace:ti OR worksite:ti OR corporate:ti OR organizational:ti OR business:ti
AND
wellness:ti OR health:ti OR prevent*:ti OR intervention:ti
AND
Productivity:ti,ab OR absen* ti,ab OR impact ti,ab OR presenteeism ti,ab OR outcome ti,ab OR incentive ti,ab OR "return on investment":ti,ab OR efficacy: ti,ab OR effect* ti,ab