Improving Low-Wage, Midsized Employers' Health Promotion Practices

A Randomized Controlled Trial

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Background: The *Guide to Community Preventive Services* (*Community Guide*) offers evidence-based intervention strategies to prevent chronic disease. The American Cancer Society (ACS) and the University of Washington Health Promotion Research Center co-developed ACS Workplace Solutions (WPS) to improve workplaces' implementation of *Community Guide* strategies.

Purpose: To test the effectiveness of WPS for midsized employers in low-wage industries.

Design: Two-arm RCT; workplaces were randomized to receive WPS during the study (intervention group) or at the end of the study (delayed control group).

Setting/participants: Forty-eight midsized employers (100–999 workers) in King County WA.

Intervention: WPS provides employers one-on-one consulting with an ACS interventionist via three meetings at the workplace. The interventionist recommends best practices to adopt based on the workplace's current practices, provides implementation toolkits for the best practices the employer chooses to adopt, conducts a follow-up visit at 6 months, and provides technical assistance.

Main outcome measures: Employers' implementation of 16 best practices (in the categories of insurance benefits, health-related policies, programs, tracking, and health communications) at baseline (June 2007–June 2008) and 15-month follow-up (October 2008–December 2009). Data were analyzed in 2010–2011.

Results: Intervention employers demonstrated greater improvement from baseline than control employers in two of the five best-practice categories; implementing policies (baseline scores: 39% program, 43% control; follow-up scores: 49% program, 45% control; $p=0.013$) and communications (baseline scores: 42% program, 44% control; follow-up scores: 76% program, 55% control; $p=0.007$). Total best-practice implementation improvement did not differ between study groups (baseline scores: 32% intervention, 37% control; follow-up scores: 39% intervention, 42% control; $p=0.328$).

Conclusions: WPS improved employers' health-related policies and communications but did not improve insurance benefits design, programs, or tracking. Many employers were unable to modify insurance benefits and reported that the time and costs of implementing best practices were major barriers.

Trial registration: This study is registered at clinicaltrials.gov NCT00452816.

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Background

Chronic diseases are leading causes of mortality and morbidity among working-age adults. Five chronic diseases—cancer, chronic lower respiratory disease, diabetes, heart disease, and stroke—account for more than 50% of adult deaths in the U.S.[1,2] and are leading causes of disabling conditions.[3] Risk behaviors associated with chronic diseases include tobacco use, unhealthy eating, and physical inactivity[4,5]; and lack of in-

fluenza vaccination and screening for breast, cervical, and colorectal cancer (www.ahrq.gov/clinic/uspstfix.htm).[4,5] Improving these behaviors would reduce substantially death and disability.[4,6] The *Guide to Community Preventive Services* (*Community Guide*) conducted systematic evidence reviews and identified successful interventions for improving these behaviors.[7–15]

Workplaces offer an important opportunity to implement *Community Guide* interventions.[16] Nearly 60% of U.S. adults are employed,[17] and workers spend a substantial proportion of their waking hours at work. Workplaces are also small communities where social environments can be changed to promote health, and a peer community of coworkers influences behavior and provides social support.[18]

Employers increasingly recognize the negative financial impact of chronic diseases on their bottom lines.[19] These diseases affect labor costs through rapidly rising healthcare costs,[20] productivity losses from missed work and decreased on-the-job effectiveness, and turnover when a worker becomes too ill to return.[21] Findings from national surveys, however, indicate that most employers have not adopted evidence-based interventions to prevent chronic diseases.[22,23]

Large employers with 1000 or more workers are most likely to offer workplace health promotion (WHP) interventions,[20,22,24] yet most workers work for small and midsized employers (defined as employers with less than 100 workers, and employers with 100–999 workers, respectively).[25] Further, small and midsized employers are more likely to employ low-wage workers,[25] who are less likely to meet physical activity recommendations or cancer screening recommendations and more likely to smoke than higher-wage workers.[26,27] Midsized employers are an underexplored target audience with the potential to reach a large proportion of low-wage workers. Midsized employers also have greater implementation capacity than small workplaces.[23,28]

Midsized employers face two major barriers in adopting and implementing health-promoting interventions: (1) they lack information needed to choose evidence-based interventions and (2) they lack resources (measured in dollars and staff time) required to implement interventions.[29] Compared with large workplaces, midsized workplaces are less likely to have staff with specialized knowledge about wellness (e.g., benefits manager or wellness coordinator) or time devoted to health or wellness activities beyond negotiating health insurance benefits.[28]

The ACS Workplace Solutions (WPS) was co-developed by the American Cancer Society (ACS) and the University of Washington Health Promotion Research Center (HPRC). Workplace Solutions is informed by Rogers's Diffusion of Innovations theory[30] and Maibach's recommendations for marketing evidence-based chronic disease prevention interventions[31] and uses an academic detailing/consulting approach to disseminate evidence-based chronic disease prevention interventions to employers. The interventions, drawn from the *Community Guide*,[7] promote workers' cancer screening, healthy eating, influenza vaccination, physical activity, sun protection, and tobacco cessation. The ACS and HPRC initially tested WPS with eight large employers in the Pacific Northwest, using a single-group, pre–post design. Employers' implementation of evidence-based interventions improved significantly, from 38% at baseline to 61% at follow-up 1 year later.[32] The goal of the present study was to adapt WPS for midsized employers (chosen as the target audience based on their characteristics described above) and test its efficacy using an RCT. The primary hypothesis was that workplaces receiving WPS would improve implementation more than workplaces in the control group at a 15-month follow-up.

Methods

Design

This was a two-group (intervention, delayed control) RCT, randomized at the workplace level. A total of 48 workplaces participated, with 24 randomized to each group. The University of Washington IRB reviewed the study procedures in 2007.

Setting/Participants

Reference USA,[33] a service that provides databases describing businesses, provided a list of all employers in King County WA (n=6683). From this list, the researchers identified employers who met eligibility criteria: 100–999 workers, headquarters located in King County, industry (identified by three-digit NAICS code) with 2005 median wage below the King County 2005 median wage, and stability (in business for at least 3 years). Five hundred forty-two employers met these eligibility criteria. One hundred seven employers met the following exclusion criteria: located >30 miles from the research site (13 employers); participated in prior research with the University of Washington (19 employers); prior relationship with ACS (12 employers); duplicate listing (nine employers); or school with a single location (54 employers). The final list included 435 employers. With 42 workplaces (21 per arm), there is 80% power to detect a 13% point difference in implementation change scores (adopting two best practices) between study arms. The researchers aimed to enroll 48 workplaces.

Recruitment Procedures

Recruitment began in June 2007 and ended in June 2008. The researchers pre-screened employers in the sample to confirm number of workers and headquarters location. Employers meeting these criteria received a letter and brochure describing the study. The researchers telephoned these employers 1–2 weeks later to conduct a screening survey, assessing all eligibility criteria. They

arranged recruitment meetings with employers who met eligibility criteria and were willing to learn more about the study.

At the recruitment meeting, the researchers explained study procedures and enrollment requirements. Employers willing to enroll signed a memorandum of understanding detailing the study procedures and completed two surveys (described in detail below). Once these measures were completed, workplaces were randomized to the intervention or control group.

Randomization Procedures

The researchers randomized workplaces after they completed baseline measures to ensure that the study team was blinded to each workplace's treatment assignment at baseline data collection. For treatment allocation, the statistician applied permuted-block randomizations, stratified on two factors: percentage of workforce with union membership (<20% vs ≥20%), and workplace size (100–249 workers vs 250–999 workers), characteristics that may affect employers' ease of adopting best practices (employers with ≥250 workers are more likely to be self-insured, which should make it easier for them to change their benefit design).

Intervention

The intervention was similar to that used in the pilot test of WPS,[32] but the research team adapted the intervention approach and materials for midsized employers. Specifically, the number of meetings with employers was increased to provide an extra opportunity for technical assistance, and the Solution Sets (described below) were redesigned to include turn-key, ready-to-use materials. An ACS staff member (the interventionist), accompanied by a member of the research team, delivered WPS to employers' human resources staff via three in-person meetings at the workplaces. All intervention meetings were held with employers' human resources staff in charge of purchasing health insurance benefits; other workplace leaders participated if they had time and interest.

The interventionist used the baseline data to develop a tailored ten-page report of recommendations for improving any of the 16 best practices that the employer was not implementing fully. At the first meeting, the interventionist gave employers the report and a presentation that summarized the recommendations and the evidence supporting them. She discussed the potential for adopting each recommended best practice and asked employers to choose 3–5 best practices to implement over the next 12 months.

At the next meeting, the interventionist delivered Solution Sets for each chosen best practice. Solutions Sets are implementation-oriented toolkits; each included an article detailing the benefits of adopting the practice and information about how to implement it, as well as supporting materials. For example, benefits toolkits included sample contract language and first-year per-member per-month costs; policy toolkits included checklists for writing and implementing new policies; and program and tracking toolkits included lists of local vendors that provide these services. The final meeting occurred 6 months after the Solution Set meeting. At this meeting, the interventionist asked employers about their progress in implementing each of their chosen best practices and offered guidance on overcoming implementation barriers. Then, the interventionist left, and the research staff conducted a semi-structured interview with the employer about which components of the intervention were most and least helpful and substantial barriers to implementing best practices.

The interventionist encouraged employers to contact her with questions and requests for implementation assistance as needed. The interventionist contacted each employer in the intervention group monthly by e-mail or telephone to offer assistance. Employers in the control group received two newsletters, which provided updates on study progress (e.g., number of employers enrolled in the study). Once control group employers provided their 15-month follow-up data, the interventionist offered WPS to them.

Main Outcome Measures

At baseline, employers completed a survey of their workplace's characteristics, insurance providers, and worker demographics. Employers' implementation of the 16 "best practices" (evidence-based interventions, presented in Table 1) were then measured using survey items adapted from Golaszewski et al.[34] Best practices fall into five categories: health insurance benefits (insurers' coverage of clinical preventive services, and use of evidence-based approaches to increase use of clinical preventive services); policies (policies related to health behavior at the workplace); programs (health-related programs that workers choose to participate in); tracking (measuring workers' health behaviors to identify their health needs and evaluate the workplaces' wellness efforts); and communications (print, multimedia, or other communications to workers about health).

The employers also reported their dollars spent per year on contracts and hours of personnel time for implementation of each practice (cost data were collected only for best practices that employers partially or fully implemented). At the 15-month follow-up, employers completed the same implementation and cost/personnel time survey. Follow-up data were collected from October 2008 to December 2009.

Data Analysis

Implementation scoring. The researchers used the same scoring approach as the WPS pilot test.[32] Questions measuring benefit coverage, tobacco-use policy, onsite influenza immunization, and tobacco quitlines had three possible scores: (1) 0 if the practice was not in place; (2) 0.75 if the practice was partially in place (e.g., cancer screening covered with a copay); and (3) 1 if the practice was fully in place (e.g., cancer screening covered with no copay or deductible). Practices partially in place received a score of 0.75 rather than 0.50 to reflect that, by covering the majority of costs for screening or services and banning tobacco use indoors, employers are implementing the practice more than halfway. Other questions received dichotomous scores; 0 for practices that were not in place and 1 for practices that were in place. If employers had a best practice in place at some worksites but not others, they received 0 if the best practice reached <75% workers and 1 if the best practice reached ≥75% workers.

For each best practice, the statistician created a summary score by summing the items measuring the practice and dividing by the number of items measuring the practice. Thus, best practices were scored as being implemented from 0% to 100%. Best-practice categories were scored by taking the mean of the individual best-practice scores within that category. The overall best-practice score for each employer was created by summing the individual best-practice scores and taking the mean.

Primary outcome analyses. The statistician calculated mean scores at baseline and follow-up by study arm for (1) each best

Table 1. Workplace solutions best practices

Benefits[a]
1. Provide full coverage for tobacco-cessation treatment
2. Provide full coverage for breast, cervical, and colon cancer screening
3. Provide full coverage for influenza vaccination
4. Require health plans to send reminders for preventive care to members and network providers
5. Require health plans to track delivery and send performance feedback to network providers
Policies
6. Ban tobacco use at worksites
7. Post "Use the Stairs" signs[b]
8. Provide facilities for physical activity
9. Make healthy food choices available and affordable
10. Require and provide sun protection for outdoor workers[b]
Programs
11. Sponsor a tobacco quitline, including nicotine replacement therapy
12. Provide influenza vaccinations onsite
13. Offer a workplace physical activity program
14. Support a weight-control program
Tracking
15. Survey workers to track effectiveness of health-promotion efforts
Communication
16. Conduct targeted health-promotion campaigns

[a]The benefits category originally included an additional best practice, full coverage of cancer treatment. This best practice was excluded from the current analyses because all employers reported implementing this practice 100% at baseline and follow-up, so no employer received a recommendation to improve this best practice as part of American Cancer Society Workplace Solutions.

[b]These best practices were promoted only to workplaces for which they were applicable. Eight of the intervention workplaces had stairs, and five had outdoor workers.

practice; (2) best practices by category (e.g., benefits, policies); and (3) the total of 16 best practices. Because of the non-normal distribution of the data, the significance of the change in scores was assessed with a nonparametric Wilcoxon rank sums test; *p*-values are based on two-sided Monte Carlo estimates for the exact test (for ease of interpretation, mean scores are presented; no adjustment for multiple comparisons was made to type 1 error rate).

Cost analyses. Mean contract costs and personnel hours spent at baseline and follow-up were calculated by study arm for ten of the 16 best practices. Costs reported for the six benefit-related practices were not included because employers had difficulty separating preventive care costs from the much larger costs of treatment; costs related to making healthy food available also were dropped because employers providing food onsite had difficulty separating costs for healthy food from their overall food-related costs. The researchers monetized personnel hours by multiplying them by the mean worker hourly wage reported across worksites. Contract costs and monetized personnel hours were summed to calculate total costs and divided by each study arm's mean number of workers to obtain annual per-worker costs. Some respondents were unable to answer specific cost questions when someone other than the respondent was responsible for managing the best practice. Consequently, the cost data were analyzed twice; first, with missing costs or hours assumed to be zero, and second, with missing costs or hours assumed to equal the mean costs or hours for that best practice.

Intervention costs. Costs of providing WPS to worksites in the intervention group included five expenditures: (1) the interventionist's salary and benefits; (2) travel for intervention visits to the workplaces; (3) printing intervention materials; (4) purchase of the list of workplaces for recruitment; and (5) indirect costs at ACS's standard rate (research-related costs were not included).

Results

Participating Workplaces

Figure 1 summarizes the recruitment and intervention flow. Forty-eight employers agreed to participate in the study, for an overall cooperation rate of 29%.[35] The 48 workplaces were randomized to intervention (n=24) or control (n=24).

Tables 2 and 3 summarize characteristics of participating workplaces and their workers (as reported by employers). The majority represented the Education and Health Services, Manufacturing, Other Services, and Wholesale and Retail Trade industries. The average annual salary reported ($38,849) was below the average annual salary in King County for 2007 of $48,560.[36] Thirty-nine percent of workers were from racial/ethnic minority groups (19% Asian/Pacific Islander, 9% African-American, 11% other). The only difference found between intervention and control workplaces was worker gender; intervention

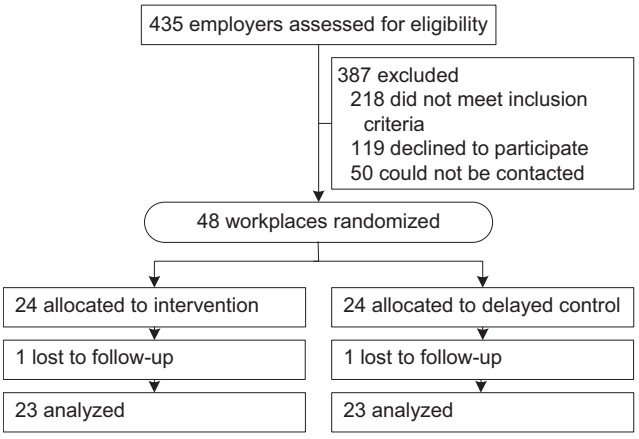

Figure 1. CONSORT 2010 diagram

Table 2. Workplace characteristics by treatment arm (n=24 per arm), n (%)

	Intervention	Delayed
Industry[a]		
Education and health services	6 (25.0)	12 (50.0)
Government	1 (4.2)	0 (0.00)
Leisure and hospitality	2 (8.3)	2 (8.3)
Manufacturing	7 (29.2)	5 (20.8)
Other services	5 (20.8)	3 (12.5)
Professional and business services	1 (4.2)	2 (8.3)
Transportation and utilities	1 (4.2)	0 (0.00)
Wholesale and retail trade	2 (8.3)	3 (12.5)
Size (no. of workers)		
100–249	10 (41.67)	9 (37.50)
250–999	14 (58.33)	15 (62.50)
Unionized workers (% of workers)		
<20	21 (87.50)	22 (91.67)
≥20	3 (12.50)	2 (8.33)

[a]Total industry categories sum to >100% because employers could choose more than one industry category.

workplaces had more men (52%) and control workplaces had more women (61%), p=0.03.

Intervention Delivery

The interventionist implemented the full WPS protocol with all 24 employers in the intervention group. Forty-six employers (23 each in the intervention and control group) provided 15-month follow-up data; primary outcome findings for these workplaces are presented below.

Change in Best-Practice Implementation

Employers in both groups slightly improved total best-practice implementation, but there was no difference between intervention and control employers (implementation increased 7.7% for intervention and 5.4% for control, p=0.328). No implementation scores for individual best practices changed; therefore, implementation scores for best-practice categories are presented in Table 4. Intervention employers improved implementation of health-related policies from baseline to follow-up (9.5% for intervention and 2.5% for control, p=0.013). Intervention employers also improved communications (33.7% for intervention and 11.4% for control, p=0.007).

Costs of Best-Practice Implementation

Employers varied widely in their best-practice implementation costs, shown by the range of estimates in Table 5. The response rate to the cost questions was 77% at baseline and 71% at follow-up. Total costs and cost per worker increased more over time among intervention than control employers. For both arms, the number of personnel hours increased over time, whereas contract costs decreased over time.

Barriers to Best-Practice Implementation

Employers in the intervention group encountered several barriers to implementing best practices. For benefits-related best practices, employers often found that their insurers would not offer a service (e.g., insurers would not send cancer screening reminders to patients), or that enhancing coverage of services would raise premium costs.

None of the employers in the intervention group had a full-time wellness coordinator, and several human resources leads reported that time was the major barrier to best-practice implementation. They were aware they could call the interventionist for assistance; many reported that they did not do this often (consistent with findings in the literature that those who need technical assistance do not always ask for it[37]).

Several best practices had no monetary costs, but others, like that of adopting a quitline, had substantial upfront costs that employers felt unable to pay. The interventionist suggested that these employers promote the free state quitline. Intervention employers marginally increased promotion of the state quitline compared to control employers (23.8% for intervention; control employers' implementation decreased 4.3%, p=0.071).

Intervention Costs

The total cost for providing WPS over 15 months to the 24 workplaces in the intervention group was $74,238. The mean cost per workplace was $3093. Based on the average number of workers in the intervention workplaces, mean cost per worker per year was $7.24.

Discussion

Employers receiving WPS improved implementation of workplace health-related policies and health communications. However, intervention employers' overall implementation scores across all best practices did not improve compared with control employers. Intervention employers completed the WPS protocol and valued the WPS process, interventionist, and materials. Therefore, it seems unlikely that the findings are due to low interven-

Table 3. Workforce and worker demographic characteristics by treatment arm (n=24 per arm), % unless otherwise noted

	Intervention		Control	
Characteristics	***n***	**M (SD)**	***n***	**M (SD)**
WORKFORCE				
Total U.S. workers	24	341.92 (236.46)	24	410.71 (268.73)
Employed full-time	24	79.79 (26.89)	24	79.45 (15.16)
Unionized	24	8.28 (21.00)	24	5.67 (16.94)
Report to a worksite	24	93.88 (20.71)	24	90.45 (21.89)
Insured (medical)	23	66.83 (22.61)	23	71.89 (20.82)
Total lives covered	19	318.58 (268.40)	18	261.00 (286.88)
WORKER DEMOGRAPHICS				
Age, years	24		19	
18–34		41.15 (22.79)		36.80 (25.33)
35–44		27.84 (16.58)		31.56 (24.89)
45–54		25.00 (18.43)		33.08 (24.19)
55–64		16.13 (19.17)		26.66 (28.25)
≥65		6.61 (19.99)		13.64 (30.51)
Gender	22		20	
Female		48.11 (20.60)		61.00* (15.39)
Race/ethnicity	23		22	
African-American/black		10.76 (10.19)		8.11 (12.92)
American Indian/Alaska Native		0.54 (0.76)		2.66 (9.06)
Asian/Pacific Islander		17.12 (15.40)		20.09 (23.55)
Caucasian/white		62.32 (21.72)		59.43 (24.88)
Multiracial		0.85 (2.09)		1.14 (2.51)
Other		6.50 (9.43)		6.36 (9.03)
Hispanic or Latino	23	9.77 (12.11)	21	4.78** (5.06)
Average annual salary ($)	24	37,593 (12,126)	23	40,160 (14,485)

Note: All workforce and worker demographic characteristics were reported by the employers.
*$p<0.05$, **$p<0.10$

tion fidelity or low employer engagement. Most employers participated in WPS during the 2008 economic downturn, so it is tempting to blame the economy. However, the fact that employers' best-practice implementation improved slightly over the course of the study suggests that, at worst, the economic situation prevented some employers from adopting new best practices.

These findings, and employers' reported implementation barriers, point to several lessons learned for future work with midsized employers. First, employers who are not self-insured appear to have little power to adjust their benefit design. Most reported that they buy health insurance "off the rack," and specific benefit-design changes are either impossible or cause unaffordable premium increases.

One key message from the interviews was that employers needed someone within their company with time to focus on implementation. None of the intervention employers had a person with a full-time wellness role. Several employers noted that the most useful WPS materials were those they could use as-is, such as posters and communication templates, and newsletters that could go directly to workers. When WPS materials directed them to visit a website or to design something themselves, several employers were unwilling or unable to take time to do this. All WPS materials need to be as turn-key as possible.

Table 4. Best-practice scores at baseline and follow-up for intervention and control workplaces, M (SD)

Best-practice category	Intervention (n=23)		Control (n=23)		p-value
	Baseline	Follow-up	Baseline	Follow-up	
Benefits	40.1 (13.3)	43.3 (14.0)	43.1 (8.9)	49.9 (16.4)	0.312
Policies	39.1 (15.6)	48.6 (21.4)	42.8 (19.3)	45.3 (19.9)	0.013
Programs	20.0 (17.9)	26.7 (22.6)	26.8 (22.2)	33.6 (23.5)	0.613
Tracking	0.0 (0)	3.3 (13.9)	10.1 (27.4)	11.6 (25.8)	0.796
Communication	41.8 (32.1)	75.5 (21.5)	43.5 (35.9)	54.9 (35.3)	0.007
Total best-practices score	31.5 (8.3)	39.2 (11.2)	36.8 (11.7)	42.1 (11.8)	0.328

Note: All scores are on a 100-point scale. Presented p-values are from Wilcoxon rank sums tests (to account for the non-normality of the data). Consistent findings were obtained when t-tests for mean differences in change scores between the two arms were performed. For ease of interpretation, mean values are presented.

The employers in the present study were a uniquely motivated group—they really *wanted* to adopt health promotion practices or they would not have agreed to participate in an RCT. This motivation was not always sufficient for implementation; the researchers' current studies measure employers' readiness to implement best practices, measured as staff capacity, commitment of senior leadership, and financial resources.[38,39]

The WHP cost findings provide new information on what midsized employers are spending. The employers in the current study spent an average of $8.00–$9.00 per worker per year at baseline. This is much less than the $150 per worker per year spent by employers who achieve cost savings from health promotion[40] and suggests that these employers have far to go before they can anticipate enough of an impact on their workers' health to realize savings in healthcare costs and gains in productivity.

Limitations and Strengths

There were several limitations to the present study. The employers were from a geographically limited area (King County WA), so findings may not generalize to employers in other areas of the U.S. Further, all the employers were interested enough in wellness to commit to the study, so there is potential for self-selection bias. Company characteristics were well balanced across the intervention and control groups, with two exceptions. First, there were more companies in the education and healthcare industries in the control group than in the intervention group. Second, companies in the control group had a higher proportion of female workers than companies in the intervention group. However, auxiliary analyses did not reveal associations of industry category or proportion of female workers with implementation of best practices or total wellness costs at either baseline or follow-up.

Table 5. Intervention and control employers' implementation costs: contracts and personnel time, M (range)

	Intervention (n=23)		Control (n=23)	
	Baseline	Follow-up	Baseline	Follow-up
Lower bound estimate–missing cost = 0				
Contract costs ($)	1326.1 (0–7,869)	635.3 (0–5,000)	2705.8 (0–16,000)	1824.4 (0–9,000)
Personnel hours	68.1 (0–420)	122.5 (0–936)	76.8 (0–325)	124.3 (0–949)
Total costs ($)	2597.8 (0–12,069)	2924.1 (0–17,482)	4139.3 (0–21,070)	4145.5 (0–17,725)
Total cost per worker ($)	7.6 (0–35)	8.6 (0–51)	10.1 (0–51)	10.1 (0–43)
Mean estimate – missing cost = average cost				
Contract costs ($)	1465.5 (0–7,869)	847.3 (0–5,044)	2979.8 (0–17,204)	2162.0 (0–9,000)
Personnel hours	72.7 (0–420)	138.9 (0–942)	81.3 (0–325)	144.3 (2–949)
Total costs ($)	2824.0 (0–12,069)	3441.3 (0–18,071)	4499.0 (0–21,595)	4857.0 (467–17,724)
Total cost per worker ($)	8.3 (0–35)	10.1 (0–53)	11.0 (0–53)	11.8 (1–43)

Note: Contract costs and personnel hours are per year. The above excludes food-vendor costs and benefit costs and hours. Personnel hours were valued at the average company wage across all companies. Per-worker costs used average number of workers for each group. "Total costs" reflect contract costs and personnel costs combined.

The implementation measures were conservative—a practice had to be available to ≥75% workers or it did not count as implemented at all. A few employers reported positive changes that reached less than 75% of their workforce, and these were not counted by the measurement criteria. No adjustments were made to the Type 1 error rate to account for multiple comparisons. Cost data were collected via questionnaire rather than from company accounts. This approach captured personnel time in addition to monetary costs, but some respondents had difficulty estimating their hours or locating contract cost information. All measures were provided by the human resources leader; future studies would benefit from assessing both senior leaders' and workers' perceptions of WPS.

The current study also had several strengths, including a powerful design. Almost all participants (96%) completed the study. The interventionist delivered WPS according to protocol to all intervention group employers; employers liked the WPS process and materials, and found the one-on-one approach with the interventionist valuable. The study tested WPS in partnership with ACS, with their staff as the interventionist. Thus, this study tested how WPS likely functions in the "real world" rather than in the confines of a typical research study.

Conclusion

In the pilot test of WPS with large employers, the approach of assessing their current implementation, providing tailored recommendations, and providing technical assistance resulted in significant improvement in implementation.[32] In the present study, testing WPS with midsized, low-wage employers, this approach increased policy and communications implementation but not benefits, programs, or tracking. A similar study to improve workplace environments supporting nutrition and physical activity in small and midsized companies obtained similar results, showing improvements in information worksites provided, but not structural or policy changes.[41]

Another study varied levels of support to worksites within one company to improve worksite support for weight management. Many worksites were able to make some improvements in their food and physical activity environments, but success varied by worksite and few met the targets.[42] Based on lessons learned from the present study and the challenges faced by other researchers, ACS and HPRC are testing a revised version of WPS that does not include benefits best practices, provides more onsite support from ACS staff, and helps employers create worker wellness committees to build internal capacity.

As the Affordable Care Act[43] includes provisions for WHP, interest in offering WHP programs likely will increase dramatically. The present study suggests that midsized employers' capacity for implementing these programs is low. Compared with large employers, who often have wellness coordinators, benefits managers, and a dedicated budget for wellness activities, midsized employers lack staff time and financial resources; small employers likely will have even less capacity. Future WHP programs targeting small and midsized workplaces need to address capacity issues through technical assistance, financial support, or building capacity within workplaces.

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