HHS Public Access

Author manuscript

J Occup Environ Med. Author manuscript; available in PMC 2017 November 30.

Published in final edited form as:

J Occup Environ Med. 2017 July ; 59(7): 631–641. doi:10.1097/JOM.0000000000001045.

The Centers for Disease Control and Prevention: Findings From The National Healthy Worksite Program

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Abstract

Objective—To evaluate employers' implementation of evidence-based interventions, and changes in employees' behaviors associated with participating in the national healthy worksite program (NHWP).

Methods—NHWP recruited 100 small and mid-sized employers and provided training and support for 18 months. Outcome measures were collected with an employer questionnaire, an employee survey, and biometric data at baseline and 18 months later.

Results—The 41 employers who completed the NHWP implemented significantly more evidence-based interventions and had more comprehensive worksite health promotion programs after participating. Employees made significant improvements in physical activity and nutritional behaviors, but did not significantly improve employee weight.

Conclusions—Training and technical support can help small and mid-sized employers implement evidence-based health interventions to promote positive employee behavior changes. A longer follow up period may be needed to assess whether NHWP led to improvements in clinical outcomes.

BACKGROUND

Approximately 70% of employers in the United States offer some type of wellness programming to employees,[1,2] although the percentage offering comprehensive programs is much lower. Comprehensive worksite health programs are a set of coordinated strategies (including programs, policies, benefits, environmental supports, and links to the surrounding community) that are implemented at the worksite, designed to improve the health and safety of all employees, and to build an organizational culture of health.[3] According to a 2004 national survey, only 6.9% of a representative national sample of worksites reported having a comprehensive health promotion program.[4] Evidence supports the effectiveness of

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Disclaimer: The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

The authors have no conflicts of interest.

comprehensive workplace health promotion programs to improve employee health and productivity outcomes.[5–8] Small and midsized employers are less likely than larger employers to have comprehensive programs.[3,9] And have limited internal capacity for implementing these programs.[10]

In 2011, the Centers for Disease Control and Prevention (CDC) launched the national healthy worksite program (NHWP). The goal was to assist approximately 100 employers in implementing comprehensive workplace health programs with evidence-based and promising health promotion and disease prevention interventions that would improve health outcomes to reduce chronic disease. The NHWP focused on interventions to improve physical activity and nutrition, and reduce tobacco use. The NHWP was unique because it targeted a large number of small employers (less than 100 employees), and gave employers training and tools to select, tailor, and implement their own interventions from an extensive list of evidence-based interventions. NHWP was designed to provide onsite support and training to employers as they planned, implemented, and evaluated their programs. As the implementation period progressed, the employers applied new knowledge and skills, and assumed more direct control over planning and implementing their programs. NHWP project staff strongly encouraged employers to implement multiple interventions to address employees' health needs and priorities.

The aim of the present study was to evaluate the effect of the NHWP on employers' implementation of evidence-based health promotion interventions, and on employees' changes in health-related attitudes, perceptions, behaviors, and weight. We hypothesized that small employers could build more comprehensive workplace health programs over time, and employees' nutrition, physical activity, and tobacco-related behaviors would be positively related to the number of nutrition, physical activity, and tobacco interventions employers had in place. We also attempted to identify specific interventions that were most strongly associated with these health behaviors.

METHODS

Employer Selection

The NHWP team started by systematically identifying eight communities (counties) with the potential to benefit most directly from investments in workforce health. To do this, the team ranked US counties based on health factors, eliminated those that had no public health infrastructure (eg, a community hospital) to support sustainable programs, and selected a representative sample of urban and rural communities from multiple geographic regions across the United States. The communities had health outcome rankings in the lower half of all the counties in their respective states.[11] To recruit employers, the NHWP team conducted a marketing campaign that included informational webinars about the program, advertisements in trade publications, and the NWHP page on the CDC Website. The NHWP team also conducted community-level speaking engagements, in-person meetings, and worksite visits. The team recruited 207 interested employers from within the eight communities, and selected 104 employers, mostly small (fewer than 100 employees) and mid-sized (100 to 250), to participate in the NHWP.

Design and Study Population

An RTI International Institutional Review Board reviewed the protocol and materials and deemed it exempt from institutional review because it was categorized as a program evaluation. This demonstration project used a pre-post-design with no employer comparison group. The study population included 100 (four of the originally selected employers withdrew before the baseline assessments were completed) employer organizations that completed the baseline worksite organizational assessment, and employees of those organizations who completed the individual-level assessments. Eligibility criteria for the employers included being located in one of the eight communities, offering employee health insurance, having leadership support for the NHWP, and not having a well-developed health promotion program in place before the NHWP began. Interested employers submitted applications. NHWP project staff screened applications and conducted phone interviews with eligible employers. Each eligible employer was scored based on their level of commitment, motivation, and willingness to participate in training and employer networking activities. Table 1 includes the sizes and locations of the participating 100 employer organizations. Table 2 provides the demographic characteristics of the participating employees from the 100 organizations. At the 2013 baseline data collection, 5471 employees participated (38.7% of eligible employees). In 2015, 1759 employees participated in the follow up data collection (23.3% of employees). There were 825 employees who participated in both the 2013 and 2015 assessments.

Program

The first year of the program was dedicated to building infrastructure, training employers, and planning for baseline organization, and employee-level assessment. The intent of NHWP was to help employers build a culture of health by implementing a comprehensive workplace health program. The participating employers began with no wellness programs in place, or were limited to the interventions and programs available through their health plans that required no direct involvement from the employers. NHWP was designed to help employers implement processes to manage and sustain their own programs, setting them on the path to improved health and economic outcomes. Employers participating in the NHWP received guidance and support from a Community Director and two additional program support staff based in each community. CDC developed a series of five “Worksite Health 101” trainings to provide guidance and recommendations for each step in building a new comprehensive workplace health promotion program (leadership buy-in and culture; assessment and data collection; program planning; program implementation; and program evaluation). Community Directors arranged in-person Worksite Health 101 training sessions in each of the eight communities and invited interested employers to attend the trainings and network with other employers and community organizations. Following the baseline assessment, the Community Directors assisted employers in using their results to develop written plans for implementing and evaluating their own new worksite health promotion programs.

Ten months after the 2013 baseline assessment, the services available to employers through the program changed due to unforeseen delays and funding limitations. On-site support initially available to employees was changed to telephone-based health coaching to promote

adoption of healthy behaviors. The Community Directors and support staff were removed and CDC subject matter experts began offering monthly one-on-one technical assistance calls to participating employers. For the next eight months, CDC experts also delivered bi-monthly online group technical assistance sessions to provide information, tools, and strategies to facilitate successful implementation of the employers' core workplace health programs. Five topics were covered on the calls: physical activity interventions; worksite nutrition strategies; engagement strategies; program sustainability strategies; and follow up assessment.

Employers who chose to stay engaged received up to 18 months of technical assistance through the duration of the NHWP. The NHWP conducted organization-level and employee-level follow up assessments in 2015, approximately 18 months after the 2013 assessment, and provided employers with reports detailing changes in employee health behaviors and other outcomes since baseline. Fifty-nine of the employers that participated in the 2013 assessment left the program before the 2015 assessment. Table 1 provides baseline characteristics for all employers and the 41 who remained in the program until the 2015 data collection.

Measures

CDC Worksite Health ScoreCard—Employer-Level Assessment—The ScoreCard is a validated instrument with 125 dichotomous items assessing the presence of evidence-based health promotion interventions across 15 health-related domains. The ScoreCard measures four types of interventions: programs, policies, environmental supports, and health benefits. Programs are workplace opportunities for employees to change or maintain health behaviors (eg, educational materials, classes, self-management programs). Policies are formal or informal statements designed to protect or promote employee health (eg, smoke-free worksite policies). Environmental supports are physical or structural elements to support employee health (eg, healthy foods available for purchase). Health benefits are aspects of the employer's overall compensation package (eg, insurance, services or discounts regarding health). All items in the ScoreCard are framed around whether the interventions were in place during the previous 12 months. Each participating NHWP employer completed one ScoreCard in 2013 shortly after being selected for the program, and approximately 18 months later in 2015.

Individual Employee Assessments—Employees completed the baseline assessment in August through October of 2013 and approximately 18 months later in 2015.

Biometric Screenings—The NHWP program provided confidential, on-site biometric screenings for participating employees to measure height, weight, waist circumference, blood pressure, fasting blood glucose, and blood lipids. Employees provided informed consent and were given their results immediately following the screening.

Self-Reported Surveys—Individual Employee Health Assessment and Culture/ Climate Audit—Employees completed a health assessment survey covering their health status and history, participation in preventive care, health behaviors (including eating,

physical activity, tobacco use), readiness to change health behavior, and interests related to worksite health and safety. Employees also completed a workplace health and safety climate survey to measure their attitudes and perceptions about their employer's, supervisors', and coworkers' support of activities to improve healthy lifestyles. In 2013, employees completed the surveys on-site during the biometric screening process. To streamline the process in 2015, employees completed the surveys on their own time and brought them to biometric screening events. At both times employees delivered completed surveys to NHWP project staff. Employees were given a detailed report of their health assessment survey results with feedback a few weeks after each assessment period. At both times, employers were given aggregate reports of their employee's results.

Lifestyle Risk—The project team developed an algorithm for categorizing employees into high, moderate, and low risk levels for lifestyle risk. Employees' lifestyle risk was based on their self-reported nutrition and physical activity behaviors. Employees' self-reported nutritional behaviors were scored (0 to 10) based on daily caloric needs, determined by sex, age, and activity level (Table 3). Points were assigned for weekly fried food, fruit, vegetable, whole grain, and non-diet soda consumption based on 2010 US dietary guidelines[12] and then summed for an overall nutrition score (Table 4). Two points were assigned for consumption of each of the following criterion: less than 10% caloric intake from fried food; at least two daily servings of fruit; at least three daily servings of vegetables; at least three to eight daily servings of whole grains (depending on age and activity level), and no consumption of non-diet sodas per week. In addition, one point was given for one non-diet soda consumed per week, and zero points for more than one per week. An employee's level of self-reported physical activity was calculated based on the number of minutes of moderate to high intensity exercise engaged in per week (Table 4). Employees were assigned a lifestyle risk level based on the sum of their nutrition and physical activity points (Table 4).

Data Analysis

Descriptive statistics (mean, SD, percentages) were performed for the presence of and changes in employer worksite interventions and employee health-related outcomes. Chi-squared and *t* tests were conducted to assess baseline differences between employers who participated in follow up from those who did not. Independent *t* tests were conducted to assess differences between employees' baseline and follow up health-related outcomes. Employees with both baseline and follow up data were used to examine the relationship between the presence of worksite interventions and employee health-related outcomes using linear mixed models for continuous outcome variables and generalized logistic mixed model using the log link for proportional outcome variables. Each model used a random effect that captured variation among respondents within each employer. Sex, age, race (non-Hispanic white, non-Hispanic other race, and Hispanic), educational attainment, level of supervisory responsibility, and assessment time point (ie, 2013 or 2015) were used as fixed effects.

RESULTS

Employer-Level Changes

We compared the 2013 data from 41 employers who remained in the program with the 59 who left the program. Relevant employee characteristics (sex, age, body mass index [BMI], nutrition and physical activity behavior) of employers who dropped out of the program were not significantly different from the employers who remained. The 59 employers who left the program began with a significantly lower mean number of evidence-based ScoreCard interventions in place, compared with the 41 who remained (26.3 compared with 31.4, P= 0.035)

The 41 employers who participated in the 2015 data collection implemented, on average, 33 additional evidence-based interventions (out of a total of 123) or a 27% increase compared with what they had in 2013 (Table 5). The employers implemented significantly more programs (27 on average), policies (three on average), and environmental supports (three on average). The average number of health benefits did not change significantly.

As a group, the 41 employers significantly increased the organizational supports they had in place to build and maintain programs and work toward creating a culture of health. The percentage of employers who indicated they had organizational commitment and support of worksite health promotion at all levels of management doubled to 88% in 2015 from 44% in 2013. The percentage of employers who had a program champion advocating for their program increased to 90% in 2015 from 51% in 2013. Most of the employers made specific changes that were strongly encouraged through NHWP training and technical assistance, including forming health promotion committees (81% in 2015 vs. 39% in 2013); setting annual organizational objectives for health promotion (78% in 2015 vs. 12% in 2013); dedicating funding for health promotion (63% in 2015 vs. 20% in 2013); and evaluating their health promotion programming (66% in 2015 vs. 12% in 2013). By 2015, most of the employers (78%) also chose to use incentives along with other strategies to increase employee participation and most (73%) used some type of competition (usually healthy eating or physical activity challenges).

As shown in Table 6, the 41 employers who remained in the program increased the number of policy and environmental interventions targeting the health behaviors central to NHWP: nutrition, physical activity, and tobacco use. Results in Table 6 show the percentages of employers who implemented a combination of policy and environmental support interventions from the ScoreCard, before and after participating in the program. For example, in 2013, 42% of the employers reported having no environmental supports and no policies related to physical activity, while 22% had at least one of each (Table 6). In 2015, only 10% reported having no environmental supports and no policies for physical activity, while 66% had at least one policy and one environmental support for physical activity.

Changes in employees' perceptions about the health-related support they received are shown in Table 7. Employees' mean rating of how supportive their employer is of their health did not change from 2013 to 2015 (7.8 on a 10-point scale where 10 = extremely supportive). A significantly higher percentage of employees in 2015 (54%) agreed that their employer

provides the opportunity to eat a healthy diet compared with 2013 (47.6%). However, a significantly lower percentage in 2015 (62.2%) agreed that their supervisor encourages healthy behavior, compared with 2013 (67.4%).

Employee-Level Changes

Comparisons of employee health-related behaviors in 2013 and 2015 are shown in Table 7, for the employees who participated at both time points. Although employees' self-reported general health remained the same (mean of 2.7 on a scale of 1 = excellent to 5 = poor), they reported improvements in health-related behaviors. The percentage of smokers decreased, although not significantly. The employees reported consuming significantly more weekly servings of vegetables and whole grains in 2015 compared with 2013, and the percentages who met nutritional and physical activity recommendations significantly increased. The percentage of employees categorized as overweight or obese did not change significantly over the 18-month period.

To display the shift of employees from one risk level to another level over the 18-month project period, we created a risk flow diagram[13] for employees' lifestyle risk (Fig. 1) using the 825 employees who participated in 2013 and 2015. The criteria used to assign employees to a lifestyle risk level are described above in the Measures section. The lifestyle risk flow depicted in Fig. 1 shows that between 2013 and 2015, about 44.9% (198/441) of the employees improved their risk level from high to moderate risk. The number of employees moving between risk levels shown with the arrows, indicate that the overall flow was in a positive direction for lifestyle risk (thick arrows between boxes). Of the employees categorized as high or moderate risk in 2013, 31.8% ([198 + 34 + 17]/[441 + 343]) moved to a more favorable risk level in 2015. Of the employees categorized as moderate or low risk in 2013, 31% ([88 + 29 + 2]/[343 + 41]) moved to a less favorable risk level (thin arrows between boxes). About 60.2% ([221 + 10]/[343 + 41]) maintained their 2013 moderate or low lifestyle risk level in 2015 (thin arrows within moderate risk and low risk boxes), and 51.2% (226/441) stayed in the high lifestyle risk level (thin arrow within high risk box). Overall, between 2013 and 2015, a greater percentage of the 825 employees moved to a more favorable risk level compared with the percentage who moved to a less favorable risk level (30.2% vs. 14.4%, $P < 0.001$). Another 28% maintained their low or moderate risk level, while the other 27.4% remained at the high risk level.

Relationship between Employer Interventions and Employee Health

We hypothesized that the number of evidence-based interventions an employer had in place would be positively related to employee health behaviors. We tested this hypothesis with separate analyses using smoking, physical activity points, and nutrition points as the outcome variables and found only limited support for this hypothesis. In each model, we controlled for employee-level demographics and employer size. We did not find significant effects when we modeled the effect of the number of tobacco interventions on employees' probability of being a smoker, or the effect of the number of nutrition interventions on employees' nutrition points. We did not find a significant relationship when we modeled the effect of the number of physical activity interventions on employees' physical activity points.

We also examined the relationship between specific interventions and the employee health behaviors the interventions are designed to improve (Table 8). We tested whether employers having each specific intervention from the tobacco, nutrition, and physical activity ScoreCard modules had a significant effect on smoking, nutrition points, and amount of physical activity. We modeled the main effects of each intervention on its respective outcome, controlling for employee demographics, employer size, and whether the data were collected in 2013 or 2015. Because we were looking for the main effect of the intervention on employee behavior, we conducted analyses from the 825 employees who had 2013 and 2015 data. For seven of the nine tobacco interventions, the percentage of employees who smoked was lower at worksites that had the tobacco intervention, compared with the percentage of employees who smoked at worksites that did not have the tobacco intervention; however, none of the differences were significant.

The results for the nutrition interventions were mixed. One nutrition policy (making healthier choices available during meetings) had a significant, positive effect on employee nutrition points ($P = 0.039$). The presence of one programmatic intervention (provide brochures, videos, or other written or online information that address the benefits of healthy eating) was associated with significantly lower employee nutrition points ($P = 0.026$).

Two physical activity environmental supports (provide an exercise facility on-site [$P = 0.031$], and post signs at elevators, stairwell entrances/exits, and other key locations that encourage employees to use the stairs [P = 0.001]) each had a significant positive effect on the percentage of employees who engage in at least 150 minutes of physical activity each week.

DISCUSSION

This study evaluated the NHWP, a CDC-led initiative designed to help a cohort of 100 employers to adopt evidence-based health promotion interventions created to improve their employees' health-related attitudes and behaviors. The employers participating in the study began the program with limited wellness activities, and operated out of communities identified as likely to benefit from health-promoting resources because of their residents' poor health relative to other counties in their states. Program staff and participating employers thus had the opportunity to dramatically increase investments in health-related resources, while simultaneously facing the significant challenge of improving employee health outcomes in contexts where such investments were likely unusual and perhaps even undervalued. The findings of this evaluation reflect the employer-level potential and employee-level obstacles that the project started with.

Employer-Level Changes

The 41 employers who remained in the program and completed both the 2013 and 2015 assessments showed significant increases in the number and type of health promotion interventions they offered to their employees. Employers nearly doubled their total number of wellness interventions, targeting a variety of health areas, and implementing a mix of programs, policies, environmental supports, and health benefits. Employers made the largest increases in the number of programs offered, many of which can be done with very low

effort and resources (eg, providing brochures, posters, pamphlets) and are focused on self-management of health. Furthermore, the number of employers offering interventions that require more effort from the employer and focused on changing the work environment also significantly increased (eg, implementation of health food policies at meetings).

NHWP program coordinators reflected on the process of implementing the NHWP, and generated several observations about what they thought made some employers more successful than others. Employers with the more robust programs created a foundation of organizational supports for health promotion. These employers had several commonalities including strong senior leadership support for health promotion (especially leaders who led by example by participating in the program themselves); highly engaged wellness committees and program champions; use of multiple health promotion strategies; the ability to keep programming fresh to encourage employee participation; frequent communications about their programs using multiple channels; and solicitation of continual input from employees about the program. The more successful employers set well-developed objectives (ie, specific, measureable, relevant, achievable, time-bound) and corresponding detailed program plans that distributed the responsibility for completing tasks. In contrast, the employers who struggled to make progress had vague plans, limited leadership support, and low involvement over time from their health promotion committees or champions. Some employers accomplished little because they had program champions who were overwhelmed by new health promotion program tasks in addition to their regular job duties, and were unable or unwilling to delegate health promotion program tasks.

Overall, employers adopted more comprehensive health promotion programs throughout the duration of NHWP. At baseline, most of the participating employers had tobacco, nutrition, and physical activity interventions that supported employee health using policies alone, environmental supports alone, or neither. At the time of follow-up, between 59% and 66% of these employers had created wellness programs that included both policies and environmental supports. Combining policies and environmental supports reflects employers' commitment to structural changes to workplace practice are likely to be sustained even if organizational priorities or funding change.

Other studies have reported improvements in the number of best-practice interventions that employers from small-sized organizations have adopted when provided recommendations and implementation tool kits.[14,15] This is one of the few national studies to demonstrate that with training, support, and guidance, a sizable number of smaller employers can adopt more comprehensive worksite health promotion programs in a relatively short period of time. The NHWP process began by increasing employers' knowledge about each step in creating a new comprehensive workplace health promotion program. This early investment in building foundational knowledge increased the capacity of the participating employers to significantly increase the number of evidence-based interventions and to sustain their programs after the NHWP ended. Providing evidence-based toolkits and training to smaller employers may be a promising, cost-effective strategy for assisting smaller employers.

Employee-Level Changes

At the employee level, changes from baseline to follow up were more difficult to characterize. The percentage of smokers decreased, although the change was not statistically significant. Employees reported improved behaviors related to nutrition and physical activity, and evidenced greater agreement that their employers had provided opportunities for the workforce to eat a healthy diet. Despite improvements in nutrition and physical activity behaviors, the percentage of these employees categorized as overweight or obese increased very slightly but non-significantly. In a group-randomized trial study of a participatory worksite health intervention where employees' mean age was 40, Seigel et al[16] found a modest decrease in body mass index (BMI) after 2 years, equivalent to a reduction in 0.23 pounds, for intervention worksite employees, compared with a gain of 2.15 pounds for control worksite employees. NHWP employees had a mean age of 45 and weight maintenance below the obese threshold over an 18-month period may be considered a positive outcome given the upward trajectory BMI often has for the middle-aged.[17] More intensive programs and the addition of in-person health coaching, which improves the management of chronic diseases and related risk factors, may have produced better results.[18]

Improvements in certain health behaviors also appeared in our analysis of employee lifestyle risk. We examined how employees moved from different levels of lifestyle risk between the 2013 and 2015 assessments. The direction of the lifestyle risk flow was mostly to more favorable risk levels or maintenance of moderate and low risk levels. Lifestyle risk levels are seemingly feasible to change in a relatively short timeframe. The benefit of employees who maintained their status in the moderate and low risk categories has been referred to as, "getting better by not getting worse."[13] In general, helping employees who were already healthy remain healthy over the 18-month period is a positive outcome for the employers, particularly for the NHWP employees who began the program with a mean age of 45.

To influence employee health, employers must create an environment that makes it possible for employees to adopt healthy behaviors, not only by implementing evidence-based interventions, but also by providing support for employees to take advantage of health promotion opportunities.[19,20] As a group, employees' mean rating of their employers' overall support for their personal health stayed a high level, suggesting that they felt supported throughout the process. Although participating employers significantly increased the number of tobacco, physical activity, and nutrition interventions offered, in 2015 significantly fewer employees agreed that their employer encouraged healthy behavior than in 2013. Employees may have had higher expectations for their managers and their employer in 2015 after being involved with the program for 18 months, and employees' knowledge about what constitutes healthy behavior may have also changed after being exposed to more health promotion programming. These findings suggest the limitations of evaluating worksite health promotion programs using employee attitudes alone.

Relationship between Employer Interventions and Employee Behaviors

We detected few statistically significant associations between employers' use of specific health promotion interventions and corresponding improvements in employees' tobacco use, nutritional behavior, or physical activity. In general, the percentage of smokers at worksites

where the tobacco interventions were present was lower than the percentage of smokers where the interventions were not present, although none of the individual interventions were significantly associated with a lower percentage of tobacco users. Similarly, the presence of some nutrition interventions was associated with improved nutritional behavior, while others were associated with worse nutritional behavior, and only two reached statistical significance. Finally, most of the physical activity interventions were associated with a higher percentage of employees who reported engaging in 150 minutes of physical activity each week, although only two reached significance. In total, three interventions emerged as significantly ($P < 0.05$) associated with improvements in employee behavior: having a written policy or formal communication which makes healthier food and beverage choices available during meetings when food is served, providing an exercise facility on-site, and posting signs at elevators, stairwell entrances/exits, and other key locations that encourage employees to use the stairs.

None of the programmatic interventions (eg, provide brochures, provide educational seminars) were associated with significant improvements in employee behavior. The NHWP employers made the biggest increases in the number of programs they added; however, the findings suggest that these lower effort interventions may not have an impact on employee behavior.

The limited number of specific interventions associated with improvements in employee health behavior could be explained in several ways. First, it may be that health promotion interventions operate as a package, such that employers should not expect to see changes in employee health from any single intervention. Second, employees may have received varying “doses” of the interventions, and the frequency and intensity of exposure to the interventions is important in order to have an effect on health behavior. Third, the impact of specific health interventions may depend on the employer and community context. For example, healthy food options may have a greater effect on employee nutrition in communities where few other lunch options are easily accessed, but less of an effect when employer-controlled foods are one of many choices available to workers.

Limitations

Limitations include our pre-/post-test design with no comparison group. Without a control group, we cannot attribute the enhancements employers made directly to their participation in the program or the specific services and support that employers received. For example, the assessment component of the NHWP, particularly completing the Worksite Health ScoreCard, may have helped employers identify interventions to implement and led to worksite changes even without the other NHWP support and training. Without a control group, we also cannot attribute changes in employees’ health to the ScoreCard interventions, as evidence suggests that the health risk assessments with feedback like those conducted in 2013 can alone work to improve employee health.[21]

The analyses of the effect of specific interventions on employee health behaviors involved multiple comparisons (approximately 30) and as such, we might expect 1 to 2 to reach 95% significance by chance alone. However, because identifying interventions most likely to influence employee behavior has practical value for employers, we presented the direction of

the relationship between each intervention and the target behavior, noting the 3 that reached significance.

We are further limited by a lack of evaluation data on employee exposure to health interventions. While we identified improvements in employees' nutritional behavior and physical activity, in particular, it remains unclear whether these changes in employees' health behavior and others may have been more apparent had we collected data on employees' participation in wellness programs, their engagement in those programs, the frequency with which they used services, and how long they remained involved. We suspect that information on these factors and a longer follow-up period would have better positioned us to assess whether or not NHWP led to measureable improvements in clinical outcomes.

The program had a high attrition rate. The program was provided at no cost to participating employers and as such, they were able to withdraw without any financial penalty. Some changes in the overall NHWP, including delays in implementation and changes in services provided, affected some employers' attitudes toward participating. The employers who left the study started with fewer interventions in place compared with the employers who remained, suggesting they may not have been as ready, had fewer resources, or had lower leadership support for health promotion. The smallest employer size group (1 to 49 employees) had the greatest rate of attrition and these were the employers most likely to have fewer resources available for health promotion. It is difficult to estimate how generalizable the findings are to other employers because only employers with few existing health promotion activities were selected for the program.

The changes in NHWP services included the removal of on-site support to employers and employee coaching. Employers who remained were forced to take more responsibility for the development and implementation of their programs earlier in the process than planned. Intensive health promotion programs with weekly contacts have been shown to be more effective than programs with less frequent contacts.[22] We know from the technical assistance calls that some NHWP employers made weekly contacts with employees through organizational communication channels (eg, newsletters). We did not have quantitative data on how well each employer implemented each intervention. In spite of these limitations, employers and employees made and sustained significant behavior changes for 18 months without the benefit of health coaching or intensive support from NHWP providers.

CONCLUSION

The NHWP demonstrated that when provided with training and support to establish a workplace health infrastructure and a data-driven planning strategy, employers of all sizes can implement evidence-based health interventions. The employers who remained in the program built comprehensive programs using evidence-based interventions from the CDC Worksite Health ScoreCard. Employers increased the number and diversity of their health promotion activities, despite very limited prior investment in employee well-ness, and significant challenges with respect to the health of residents in their communities. It remains to be seen whether or not these employers will sustain these programs in light of shifting priorities, leadership transitions, and changes in employees' health. The attrition of some

employers between 2013 and 2015 suggests that mobilizing available resources continues to be a challenge for many organizations.

This program also revealed challenges with respect to demonstrating intervention-related improvements in employees' attitudes and health behavior outcomes. We identified promising trends with respect to employees' nutritional behavior and physical activity, in particular. However, it remains unclear whether and how these changes will ultimately affect clinical outcomes. Our findings with these employers suggest that offering a diverse set of strategies with an emphasis on combining individual-level interventions with changes to the organizational environment may be a promising approach.

The NHWP encouraged employers to move beyond traditional wellness programs—changing individual employee behavior through education and coaching—by adopting a broader strategy to change the work environment and build a culture of health. The program and interventions associated with the CDC Health ScoreCard expanded employers' capacity to improve employee health and evidenced short-term improvements in employees' behavior, reflecting the potential of worksite health promotion to improve outcomes for both employers and employees.

Acknowledgments

The authors acknowledge the support of all CDC staff who provided technical assistance to employers. They also thank all of the employers who participated in the program and all of the employees who completed assessments.

Source of Funding: This work was supported by CDC under contract award no. 200-2008-27958 to RTI International.

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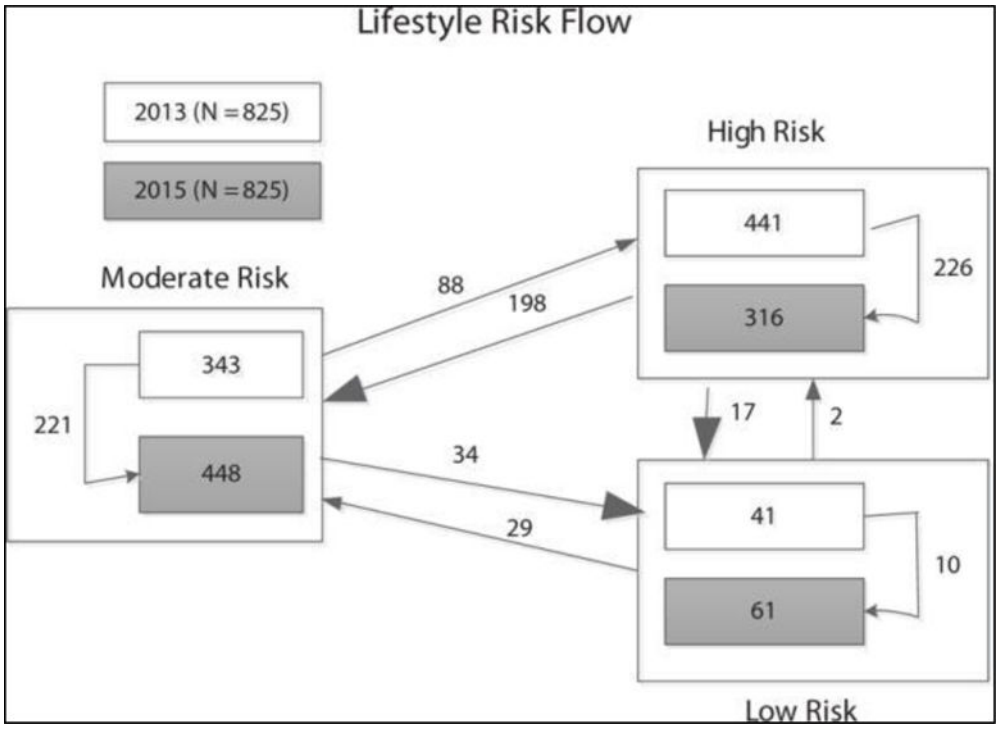

FIGURE 1.

Boxes show the number of employees categorized in high, moderate, and low lifestyle risk categories at the 2013 assessment and the assessment 18 months later in 2015. The arrows show the number of employees changing or remaining in life style risk categories between 2013 and 2015. Between 2013 and 2015, 30.2% of the 825 employees moved to a more favorable risk level (bolded arrows), while 14.4% moved to a less favorable risk level ($P < 0.001$). Another 28% maintained their moderate or low risk levels over the 18 months, and the remaining 27.4% stayed at the high risk level.

TABLE 1

Size, Location, and Industry of All NHWP Employers and the Subset of Employers Who Remained for the Duration of the Program

	2013	2015
All employers	100	41
Employer size		
1–49	27	7
50–99	21	8
100–249	35	14
250–499	13	8
500+	4	4
Community/County		
Buchanan, MO (St. Joseph)	10	5
Harris, TX (Houston)	12	1
Kern, CA (Bakersfield)	13	9
Marion, IN (Indianapolis)	13	8
Philadelphia, PA (Philadelphia)	13	8
Pierce, WA (Tacoma)	15	6
Shelby, TN (Memphis)	11	4
Somerset, ME (Skowhegan)	13	0
Industry sector		
Health care & social assistance	33	14
Finance, insurance, real estate	14	11
Manufacturing	12	5
Public administration	12	4
Professional, scientific, technical services	8	3
Retail & wholesale	6	1
Construction	5	1
Other	10	2

TABLE 2

Baseline (2013) Employee Demographics for All Employees and Baseline Data for the Matched Subset of Employees Who Participated in Both Assessments

	All Baseline	Matched*
Sample size	5,471	825
% Female	63.8	73.8
Race		
% White	70.5	74.1
% Black	18.7	15.5
% Other race	10.8	4.9
% Hispanic	11.2	8.9
Mean age (SD)	43.2 (12.3)	44.9 (11.9)
Education		
% High school or less	17.6	11.0
% Some college	31.8	32.0
% College or higher	50.6	57.0
% with supervisory or managerial responsibility	29.4	33.8

SD, standard deviation.

*Matched employees are those with data in 2013 and 2015.

TABLE 3

Daily Caloric Needs Based on Sex, Age, and Physical Activity Level

	Age	Sedentary	Moderately Active	Active
Females	14–18	1,800	2,000	2,400
	19–30	1,800–2,000	2,000–2,200	2,400
	31–50	1,800	2,000	2,200
	51+	1,600	1,800	2,000–2,200
Males	14–18	2,000–2,400	2,400–2,800	2,800–3,200
	19–30	2,400–2,600	2,600–2,800	3,000
	31–50	2,200–2,400	2,400–2,600	2,800–3,000
	51+	2,000–2,200	2,200–2,400	2,400–2,800

TABLE 4

Lifestyle Risk Components, Indicators, Recommendations, and Scoring

Component/Risk Indicator	Recommendation	Scoring
Nutrition*		
Fried food	≤160–320 calories/week	2 points
Fruit	≥10.5–17.5 servings/week	2 points
Vegetables	≥14–28 servings/week	2 points
Whole grains	≥21–56 servings/week	2 points
Non-diet soda	Less than 1 serving/week	2 points
Moderate physical activity†	150 min/week	
1–29 min		2 points
30–149 min		4 points
150–199 min		6 points
200–299 min		8 points
>300 min		10 points
Lifestyle risk		
High	Take action	≤5 total points or any tobacco use 6–14 total points
Medium	Improve on	
Low	Doing well	≥15 total points

*Based on 2010 US dietary guidelines, which depend on sex, age, and physical activity level.[11]

†We standardized time spent engaging in physical activity of different intensities as follows: minutes of high intensity activity = minutes of moderate intensity activity* 2. Adults aged 18 to 64 need 150 minutes of moderate intensity physical activity or 75 minutes of high intensity physical activity per week. Based on CDC guidelines for adults: https://www.cdc.gov/physicalactivity/basics/adults/index.htm.

TABLE 5

Mean Number of Interventions Employers had in Place in 2013 and 2015 by Intervention Type (*N*=41) Across Health Topics

Intervention Type	Total Possible	2013 Mean (SD)	2015 Mean (SD)	*P*
All interventions	123	42.0 (14.2)	75.4 (16.6)	<0.001
Programs	77	22.3 (10.7)	49.1 (12.5)	<0.001
Policies	18	7.3 (2.7)	10.1 (2.9)	<0.001
Environmental supports	17	4.4 (1.9)	7.3 (2.5)	<0.001
Health benefits	11	8.0 (2.5)	8.9 (2.4)	0.083

SD, standard deviation.

TABLE 6

Percentage of Employers with Policies and Environmental Supports for Tobacco, Nutrition, and Physical Activity at 2013 and 2015 (*N*=41)

2013					2015				
Tobacco									
			Policy					Policy	
		No		Yes			No		Yes
Environmental support	No	4%		60%	Environmental support	No	2%		32%
	Yes	1%		35%		Yes	0%		66%
Nutrition									
			Policy					Policy	
		No		Yes			No		Yes
Environmental support	No	5%		0%	Environmental support	No	0%		0%
	Yes	73%		22%		Yes	41%		59%
Physical activity									
			Policy					Policy	
		No		Yes			No		Yes
Environmental support	No	42%		15%	Environmental support	No	10%		5%
	Yes	21%		22%		Yes	20%		66%

TABLE 7

Employee Health-Related Behaviors and Attitudes at 2013 and 2015 (*N*=825)

	2013	2015	*P*
Mean perceived company support for personal health [*] (SD) % Agree [†] that employer provides opportunity to:	7.8 (2.0)	7.8 (2.1)	0.791
Be physically active	55.5	59.0	0.129
Eat a healthy diet	**47.6**	**54.0**	**0.009**
Live tobacco free	64.1	63.4	0.458
Work safely	**82.0**	**77.7**	**0.008**
% Agree [†] that supervisor encourages healthy behavior	**67.4**	**62.2**	**0.033**
% Agree [†] that management prioritizes workplace health and safety	92.9	90.3	0.055
Mean general health rating [‡] (SD)	2.7 (0.8)	2.7 (0.8)	0.559
% Smoke tobacco	14.1	11.8	0.245
Mean number of fruit servings/week (SD)	8.5 (11.4)	9.0 (8.4)	0.351
Mean number of vegetable servings/week (SD)	**8.3 (9.9)**	**10.1 (9.1)**	**<0.001**
Mean number of whole grain servings/week (SD)	**5.4 (7.0)**	**7.1 (7.1)**	**<0.001**
Mean number of sodas consumed/week (SD)	2.2 (6.2)	1.7 (3.9)	0.075
Mean number of fried food servings/week (SD)	2.3 (3.5)	2.3 (3.7)	0.831
% Meeting nutritional recommendations [§]	**5.3**	**10.0**	**<0.001**
% Meeting recommendations for physical activity [‖]	**29.9**	**38.6**	**<0.001**
Weight			
% Normal weight (BMI <25)	30.8	28.5	0.738
% Overweight (BMI between 25 and 30)	30.4	29.7	0.739
% Obese (BMI 30+)	38.8	41.8	0.246

BMI, body mass index; SD, standard deviation.

[*] Employees answered, “Overall, how supportive is your company of your personal health?” on a 10-point scale (1 = extremely unsupportive to 10 = extremely supportive).

[†] Percentages of employees who “Agree” or “Strongly Agree” with statements.

[‡] Employees rated their general health on a five-point scale (1 = excellent to 5 = poor).

[§] Employees’ self-reported nutritional behaviors were scored (0 to 10) as described above in Measures. Employees met the recommended guidelines if they had at least seven points.

[‖] Employees’ level of self-reported physical activity was scored as described above in Measures. Employees reporting at least 150 minutes of moderate activity, or at least 75 minutes of high intensity activity were categorized as meeting recommended physical activity guidelines.

TABLE 8

The Number and Percentage of Employers with ScoreCard Interventions. Percentage of Employees Who Smoke, Employees' Mean Nutrition Points, and Percentage of Employees Engaging in At Least 150 Minutes of Weekly Physical Activity at Worksites Where Intervention is Not Present Compared with Where Intervention is Present in either 2013 or 2015 (825 Employees)

	% Employees Who Smoke (SE)				
	No. of Employers with Intervention (%)		Intervention		
ScoreCard Tobacco Interventions	**2013**	**2015**	**Not Present**	**Present**	***P***
Have a written policy banning tobacco use at your worksite? [Tobacco policy]	22 (59.5)	23 (62.2)	10.2 (2.86)	9.4 (2.49)	0.751
Actively enforce a written policy banning tobacco use? [Tobacco policy]	15 (40.5)	23 (62.2)	10.4 (2.79)	9.2 (2.48)	0.573
Display signs (including "no smoking" signs) with information about your tobacco-use policy? [Tobacco environmental support]	14 (37.8)	23 (62.2)	11.5 (2.96)	7.6 (2.21)	0.073
Refer tobacco users to a state or other tobacco cessation telephone quit line?	10 (27.0)	24 (64.9)	10.4 (2.68)	8.6 (2.52)	0.412
Provide health insurance coverage with no or low out-of-pocket costs for prescription tobacco cessation medications including nicotine replacement?	21 (56.8)	26 (70.3)	10.5 (2.91)	9.3 (2.42)	0.562
Provide health insurance coverage with no or low out-of-pocket costs for FDA-approved over-the-counter nicotine replacement products?	10 (27.0)	18 (48.7)	10.3 (2.64)	8.9 (2.58)	0.531
Provide or promote free or subsidized tobacco cessation counseling?	17 (46.0)	23 (62.2)	11.5 (2.96)	7.6 (2.21)	0.071
Inform employees about health insurance coverage or programs that include tobacco cessation medication and counseling?	13 (35.1)	28 (75.7)	9.7 (2.67)	9.8 (2.64)	0.953
Provide incentives for being a current non-user of tobacco and for current tobacco users that are currently involved in a cessation class or actively quitting?	3 (8.1)	5 (13.5)	9.9 (2.44)	7.6 (3.18)	0.455
Do not allow sale of tobacco products on company property? [Tobacco policy]	40 (97.3)	39 (94.6)	2.0 (2.36)	10.1 (2.47)	0.150
	Employees' Mean Number of Nutrition Points * (SE)				
	No. of Employers with Intervention (%)		**Intervention**		
ScoreCard Nutrition Interventions	**2013**	**2015**	**Not Present**	**Present**	***P***
Have a written policy or formal communication that makes healthier food and beverage choices available in cafeterias or snack bars? [Nutrition policy]	4 (10.8)	10 (27.0)	3.49 (.09)	3.68 (0.13)	0.062
Have a written policy or formal communication that makes healthier food and beverage choices available in vending machines? [Nutrition policy]	3 (8.1)	12 (32.4)	3.51 (.09)	3.54 (.12)	0.782
Make most (more than 50%) of the food and beverage choices available in vending machines, cafeterias, snack bars, or other purchase points be healthy food items? [Nutrition environmental support]	8 (21.6)	14 (37.8)	3.54 (.09)	3.46 (.11)	0.423
Provide nutritional information (beyond standard nutrition information on labels) on sodium, calories, trans-fats, or saturated fats for foods and beverages sold in worksite cafeterias, snack bars, or other purchase points? [Nutrition environmental support]	3 (8.1)	10 (27.0)	3.51 (.09)	3.55 (.13)	0.719

ScoreCard Tobacco Interventions	% Employees Who Smoke (SE)				
	No. of Employers with Intervention (%)		Intervention		
	2013	2015	Not Present	Present	*P*
Identify healthier food and beverage choices with signs or symbols? [Nutrition environmental support]	8 (21.6)	13 (35.1)	3.56 (.09)	3.40 (.11)	0.087
Subsidize or provide discounts on healthier foods and beverages offered in vending machines, cafeterias, snack bars, or other purchase points? [Nutrition policy]	1 (2.7)	6 (16.2)	3.51 (.09)	3.61 (.15)	0.462
Have a written policy or formal communication which makes healthier food and beverage choices available during meetings when food is served? [Nutrition policy]	4 (10.8)	11 (29.7)	**3.47 (.09)**	**3.68 (.12)**	**0.039**
Provide employees with food preparation and storage facilities? [Nutrition environmental support]	34 (91.9)	36 (97.3)	3.30 (.18)	3.53 (.09)	0.162
Offer or promote an onsite or nearby farmers market where fresh fruits and vegetables are sold? [Nutrition environmental support]	6 (16.2)	23 (62.2)	3.52 (.10)	3.51 (.10)	0.936
Provide brochures, videos, posters, pamphlets, newsletters, or other written or online information that address the benefits of healthy eating?	18 (48.7)	34 (91.9)	**3.67 (.11)**	**3.45 (.10)**	**0.026**
Provide educational seminars, workshops, or classes on nutrition?	8 (21.6)	25 (67.6)	3.55 (.10)	3.48 (.10)	0.443
Provide free or subsidized lifestyle self-management programs that include advice or tools on healthy eating?	7 (18.9)	19 (51.4)	3.55 (.09)	3.45 (.11)	0.288
ScoreCard Physical Activity Interventions	**% Employees Engaging in > 150 Minutes Weekly Physical Activity (SE)**				
	No. of Employers with Intervention (%)		**Intervention**		
	2013	**2015**	**Not Present**	**Present**	***P***
Provide an exercise facility on-site? [Physical activity environmental support]	6 (16.2)	11 (29.7)	**26.2 (2.7)**	**32.5 (3.7)**	**0.031**
Subsidize or discount the cost of onsite and/or offsite exercise facilities? [Physical activity policy]	13 (35.1)	25 (67.6)	25.5 (2.9)	30.3 (3.2)	0.086
Provide environmental supports for recreation or exercise? [Physical activity environmental support]	11 (29.7)	29 (78.4)	25.9 (3.0)	29.3 (3.0)	0.236
Post signs at elevators, stairwell entrances/exits and other key locations that encourage employees to use the stairs? [Physical activity environmental support]	2 (5.4)	9 (24.3)	**25.7 (2.6)**	**36.8 (4.3)**	**0.001**
Provide organized individual or group physical activity programs for employees (other than the use of an exercise facility)?	7 (18.9)	27 (73.0)	25.8 (2.9)	30.1 (3.2)	0.157
Provide brochures, videos, posters, pamphlets, newsletters, or other written or online information that address the benefits of physical activity?	17 (46.0)	33 (89.2)	27.2 (3.4)	28.1 (2.9)	0.777
Provide educational seminars, workshops, or classes on physical activity?	7 (18.9)	27 (73.0)	28.2 (3.1)	27.4 (3.1)	0.802
Provide or subsidize physical fitness assessments, follow-up counseling, and exercise recommendations either onsite or through a community exercise facility?	2 (5.4)	12 (32.4)	28.2 (2.8)	26.2 (3.8)	0.576
Provide free or subsidized lifestyle self-management programs that include advice on physical activity?	8 (21.6)	19 (51.4)	28.2 (2.9)	27.3 (3.1)	0.763

FDA, food and drug administration; SE, standard error.

*Description of employee nutrition points is provided in Measures section.