A Worksite Obesity Intervention: Results From a Group-Randomized Trial

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Objectives. We used a participatory process to develop an obesity intervention appropriate for elementary school personnel.

Methods. A randomized controlled trial included 16 school worksites (8 intervention, 8 control). Intervention schools formed committees to develop and implement health promotion activities for employees. Anthropometric and self-report data were collected at baseline and postintervention (2 years later). The primary outcome measures were body mass index (BMI), waist–hip ratio, physical activity, and fruit and vegetable consumption.

Results. After adjustment for age, ethnicity, and job classification, employees in intervention schools reduced their BMI by an average of 0.04 kg/m^2, and those in control schools increased their BMI by an average of 0.37 kg/m^2. Comparisons for waist–hip ratio, weekly physical activity minutes, and fruit and vegetable consumption were not significant.

Conclusions. The participatory process appeared to be an effective means for stimulating change. The intervention may have slowed and perhaps reversed the tendency of adults to gain weight progressively with age. (*Am J Public Health.* 2010;100:327–333. doi:10.2105/AJPH.2008.154153)

Obesity in the United States is a major cause of preventable disease. Among adults, 31% of men and 33% of women are considered obese (body mass index [BMI; weight in kilograms divided by height in meters squared] ≥ 30 kg/m^2),[1] and prevalence of obesity is higher among ethnic minorities than among non-Hispanic Whites. Obesity is associated with life-threatening chronic disease[2] and was responsible for the largest increase among causes of death in the decade between 1990 and 2000.[3] Health problems associated with obesity cost the health care system an estimated $75 billion per year,[4] and indirect costs, such as loss of work time, further inflate this figure.

In his *Call to Action to Prevent and Decrease Overweight and Obesity*, the surgeon general cited schools and worksites as environments that can promote the development of healthful behaviors.[5] Almost 6 million adults work in public schools in the United States.[6] The school environment is thought to be conducive to worksite health promotion because of access to facilities for physical activity and for educational purposes.[7] Staff wellness is 1 of the 8 components of the Coordinated School Health Model, a conceptual model that addresses the school environment.[8,9] Health promotion in the school setting has the potential of reducing absenteeism, lowering turnover rates, and lowering insurance rates. In addition to these direct benefits, healthy teachers create an optimistic school climate, serve as role models to students, and reinforce positive health messages. These teachers are also more likely to incorporate health education into their lessons.[10] Broadly, healthy employees influence the school community, including parents and students.[7]

We used a participatory process to develop an intervention appropriate for elementary school personnel. The goal was to reduce obesity by promoting healthy dietary and exercise behaviors among personnel in a large, urban school district. Community-based participatory research is a cooperative process that engages community members and researchers as equals,[11] involving community members in designing and implementing interventions appropriate for their needs.[12] This approach has been shown to enhance effectiveness and save time and money.[13] The participatory process may foster an enhanced sense of ownership, thereby increasing the likelihood that interventions will be institutionalized and sustained after startup resources have been exhausted.

The overall theoretical umbrella for this research is social cognitive theory,[14] emphasizing the person, the environment, and their interaction. Self-efficacy, or the individual's belief that she or he can perform the behaviors to reach the desired goal, is a key personal construct that has been associated with behavior change. Perceived barriers to change, such as lack of access to healthful food or opportunities for exercise, are an important aspect of the environmental domain. Impressions of the social norms regarding behaviors are relevant to the interaction of the person and the environment. The participatory process of developing the intervention can enhance the extent to which school personnel share norms about the value of maintaining a healthy weight and the means to achieve it. The emphasis on social norms in behavior change is also compatible with the theories of reasoned action and planned behavior.[15,16] In any group intervention, but particularly one that incorporates a participatory process, the group environment becomes part of the intervention. Thus, an environment that builds camaraderie and fosters support can be a crucial element in the success of the intervention.

In the analyses presented here, we tested 2 hypotheses: (1) individuals employed at school worksites randomly assigned to be intervention schools would be significantly more likely to lose weight (as evidenced by reduction in BMI and waist–hip ratio) than individuals employed at comparable control worksites; and (2) individuals in intervention schools would be significantly more likely to change diet and physical activity behaviors than individuals at control worksites. In sum, the hypotheses address the questions of whether the intervention worked and how it worked.

METHODS

This study was a randomized controlled trial, conducted between 2005 and 2007, in which school worksites were the unit of randomization and intervention. Sixteen elementary schools in 2 geographic areas of Los Angeles, California, were recruited for the study and randomly assigned to intervention or control conditions. No school sites or study participants were contacted prior to full approval from the university and school district review boards.

Setting

The Los Angeles Unified School District is the second largest school district in the United States. It is separated into 8 local districts. The study was conducted in the 4 local districts where the researchers had established relationships with district personnel. Introductory letters were sent to the principals of elementary schools in these local districts if 50% or more of the enrolled students were eligible for free or reduced-price meals (161 schools). The letter indicated that schools selected as intervention sites would be required to form a worksite wellness committee of school employees, with responsibility for developing health promotion activities and recruiting participants for these activities. The principals of 31 schools expressed interest; from these schools, we selected 16 for participation, which comprised 2 geographic clusters: Hollywood/Metro and East/South Los Angeles. Data for the 3 health department service planning areas where these schools were located showed that the percentage of the population living at or below the federal poverty level ranged from 21% to 42%. Following collection of baseline data in the spring of 2005, the 16 study schools were randomly assigned to the intervention or control condition.

Intervention

Beginning in the fall of 2005, each of the 8 intervention schools formed a worksite wellness committee of volunteers to develop and implement health promotion activities for its employees. These committees (range=3–10 people) met about every 2 months (range=3–9 meetings in academic year) and primarily comprised teachers, but also included administrative staff (principal, assistant principal), other academic staff (teacher aides), and support staff (office and food service personnel, custodians). Before forming the committees, the intervention schools conducted brief written surveys of the employees to identify the types of wellness activities that interested them and their preferred scheduling. In keeping with the collaboration that is central to the participatory process, a school liaison (who was employed by the research study) attended the committee meetings, recorded minutes, followed up on action items, and offered technical assistance to the committees in carrying out their activities. Contingent on providing school-level data to the researchers, each intervention school was given a stipend of $3500 per year (for 3 years) to subsidize its wellness activities. Each control school was given an unrestricted stipend of $1000 at baseline and follow-up.

Most of the health promotion activities developed by the wellness committees were directed at improving diet (e.g., healthy snacks at meetings) or increasing physical activity (e.g., walking clubs), but others were more broadly focused, such as stress management or training in cardiopulmonary resuscitation (CPR) and first aid. In the second year of the intervention, the research study sponsored an interschool competition and awarded cash prizes for high levels of participation in wellness activities. In addition to the activities planned by the committees, the study sponsored several programs for employees at all intervention schools, such as a healthy cooking class and a quarterly newsletter. An advisory board, made up of research personnel and at least 1 committee member from each intervention school, met 5 times during the course of the intervention. They discussed facilitating factors and barriers to implementing the wellness programs.

Data Collection

Anthropometric measures and a self-administered questionnaire, the 2 modes of data collection, were assessed between April and June 2005, prior to the randomization of the 16 schools into intervention and control sites. All employees at the elementary schools were eligible to volunteer for baseline data collection (i.e., to be measured and to answer the questionnaire). Gift certificates to a local grocery store were offered as an incentive for participation in data collection.

The anthropometric measurements, assessed by trained study personnel, took place before school, during lunch, or after school. The written questionnaire was group administered during professional development time or at a faculty meeting. Data were collected from 413 volunteers at baseline.

Postintervention data were collected between April and June 2007. All employees at the 16 elementary schools were eligible for postintervention data collection, regardless of whether they completed the baseline measurements or took part in any wellness activities. The procedures and instruments for postintervention data collection were identical to those used at baseline except that at the intervention schools, questions about participation in wellness activities during the prior 2 academic years were added. Gift certificates to a local grocery store were offered as an incentive for participation. Data were collected from 340 respondents after the intervention; 125 respondents were assessed at both baseline and postintervention. Table 1 shows the number of participants by site and data collection timing (baseline or postintervention).

Measures

Weight was measured on a calibrated electronic scale (model 882; Seca, Hanover, Maryland) to the nearest 0.1 kg. Height was measured with a stadiometer height board (IP 09555; Invicta Plastics, Leicester, England) to the nearest 0.1 cm. Both weight and height were assessed twice, and the average of the 2 measurements was recorded. BMI was calculated from the weight and height measurements. Waist and hip circumferences were measured with a cloth tape measure, over the participant's clothing, to the nearest 0.1 cm; circumferences were assessed twice, and the average of the 2 measurements was recorded. Waist–hip ratio was calculated from these 2 averages.

The other measures were part of a self-administered questionnaire. Physical activity was assessed with the International Physical Activity Questionnaire (IPAQ) Short Form, which asks respondents to report time spent in sedentary activity, moderately vigorous activity, vigorous activity, and walking in the prior 7

TABLE 1—Number of Participants, by Site and Time of Data Collection, in an Obesity Intervention for Elementary School Personnel: Los Angeles, CA, 2005–2007

School	Baseline Only, No.	Postintervention Only, No.	Baseline and Postintervention, No.
Intervention			
1	12	27	9
2	11	14	3
3	24	3	4
4	11	5	7
5	15	18	8
6	28	8	9
7	27	7	16
8	17	14	10
All	145	96	66
Control			
9	4	18	5
10	10	15	10
11	30	13	4
12	19	22	1
13	15	11	9
14	19	13	6
15	25	12	16
16	21	15	8
All	143	119	59
Total	288	215	125

Note. Number of baseline cases = 288 (with baseline data only) + 125 (with both baseline and postintervention data) = 413; number of postintervention cases = 215 (with postintervention data only) + 125 (with both baseline and postintervention data) = 340. At each site, study personnel attempted to recruit 30 school staff members for voluntary participation. The intervention targeted the entire school; thus, no effort was made to recruit the same individuals to participate in data collection at baseline and postintervention.

days. Responses were recoded to metabolic equivalent minutes and summed to give the total number of minutes of physical activity in the last week. The IPAQ Short Form has been shown to be reliable and valid over a broad range of age, gender, and cultural groups, with an average test–retest reliability of 0.76.[17] Fruit and vegetable consumption was determined by a food frequency questionnaire developed for the National Cancer Institute (NCI), the NCI All-Day Screener.[18] Questionnaire items ask respondents how often during the past month they ate different types of food and the quantity they usually ate. The NCI All-Day Screener has been used in adult populations in the United States and has been shown to estimate fruit and vegetable intake to within 1.2 servings per day.[19]

In addition to the IPAQ Short Form and the NCI All-Day Screener, the questionnaire assessed sociodemographic characteristics, including date of birth, gender, education, household income, job classification, and race/ethnicity. Job classification included the following categories: school administrator, teacher, teaching assistant, food service staff, health service staff, other certificated staff (e.g., librarian), and other classified staff (e.g., custodial). Because of the small numbers of non-teaching staff who participated in data collection, for the analysis, job classification was categorized as teacher and other staff. For race/ethnicity, respondents were asked to select the racial/ethnic group or groups with which they identified. Respondents who reported being Hispanic or Latino were coded as Hispanic, regardless of other reported race/ethnicity. The remaining respondents were categorized into the appropriate single racial/ethnic category (i.e., non-Hispanic White, non-Hispanic African American, Asian, or American Indian) or, for those who selected more than 1 group other than Hispanic or Latino, as mixed race/ethnicity. Because of the small numbers of Asians, American Indians, and mixed race/ethnicity, these groups were collapsed into a single category for analysis.

Analytic Procedures

All analyses were conducted with Stata version 9.2/SE (StataCorp LP, College Station, TX). The hypotheses—that individuals employed at intervention schools would be significantly more likely (1) to lose weight and (2) to change diet and physical activity behaviors—were tested with analytic techniques that accounted for the clustering of individuals within school worksites. Using baseline and postintervention data, we built linear mixed models for each outcome (BMI, waist–hip ratio, metabolic equivalent minutes of activity per week, and daily fruit and vegetable consumption). Mixed models draw from the maximum information available and allow for designs where there are unequal numbers of observations at each time point.[20,21] In these models, treatment condition (intervention or control) and time (baseline and postintervention) were included as fixed effects, and school worksite was included as a random effect. Individuals with both baseline and postintervention data (n=125) were incorporated into the analysis as repeated measures by addition of a random effect for individuals. Covariates were added to these models to control for factors that may have been unbalanced between the intervention and control groups, despite randomization. Covariates included age (dichotomized as <40 years and ≥40 years), ethnicity (dichotomized as Hispanic and non-Hispanic), and job classification (dichotomized as teachers and all other staff). We calculated adjusted means using the coefficients from the linear mixed regression models.

RESULTS

Table 2 shows the characteristics of the sample at baseline, by intervention condition. The average age was 40 years; they were well-educated (42% with a master's degree or above) and had high incomes (about a third of the sample had annual incomes above

TABLE 2—Selected Characteristics at Baseline of Participants in an Obesity Intervention for Elementary School Personnel, by Randomization Group: Los Angeles, CA, 2005–2007

	Control (n = 202), Mean (SE) or %	Intervention (n = 211), Mean (SE) or %	P[a]
Age, y	39.5 (0.84)	40.0 (0.73)	.66
Daily fruit servings, cups	2.09 (0.21)	1.87 (0.13)	.35
Daily vegetable servings, cups	2.75 (0.19)	2.81 (0.16)	.82
Body mass index, kg/m^2	27.9 (0.51)	28.4 (0.45)	.44
Waist circumference, cm			
Women	92.3 (1.62)	91.9 (1.19)	.84
Men	96.7 (2.15)	98.3 (2.80)	.64
Waist–hip ratio			
Women	0.86 (0.01)	0.85 (0.01)	.66
Men	0.91 (0.01)	0.92 (0.01)	.62
Educational attainment			
Some college or less	12.0	16.8	.17
Associate's degree	7.6	3.2	
Bachelor's degree	38.0	38.4	
Master's degree or above	42.4	41.6	
Women	73.8	83.4	.02
Race/ethnicity			
White	27.0	19.6	.01
African American	9.7	4.1	
Hispanic	45.4	60.8	
Other or multiracial	17.8	15.5	
Job classification			
Teacher	64.8	67.0	.66
Other staff	35.2	33.0	
Employed full-time	93.4	90.7	.32
Income, $			
< 25 000	8.8	7.4	.55
25 000–44 999	19.2	14.9	
45 000–64 999	26.4	23.4	
65 000–84 999	17.6	19.7	
> 85 000	28.0	34.6	
BMI category			
Underweight (< 18.5 kg/m^2)	1.6	1.5	.58
Normal weight (18.5–24.9 kg/m^2)	41.5	34.8	
Overweight (25–30 kg/m^2)	25.9	30.4	
Obese (> 30.0 kg/m^2)	31.1	33.3	
Physical activity level			
Inactive	36.0	27.9	.15
Moderately physically active	46.3	47.9	
Health-enhancing physically active	17.7	24.2	

Note. BMI = body mass index (weight in kilograms divided by height in meters squared). Missing data were not considered in determining means and percentages.
[a]*P* for *t* tests of independent samples (continuous variables) or χ^2 analysis (categorical variables).

$85 000). The majority were women (74% in control condition, 83% in intervention condition), and about two thirds of the sample were teachers. Regarding dietary practices, they approached the recommended 5 servings of fruit and vegetables per day, with an average of 4.8 daily servings in the control condition and 4.7 in the intervention condition. Regarding fitness, they were generally overweight (mean BMI=27.9 in control condition and 28.4 in intervention condition) and did not achieve health-enhancing levels of physical activity (e.g., producing vigorous increases in respiration rate, heart rate, and sweating for at least 10 minutes). The intervention schools differed statistically from the control schools by gender and race/ethnicity: the intervention group had a higher proportion of women, fewer staff identifying as White or African American, and more staff identifying as Hispanic.

Table 3 presents the mean values for the anthropometric, diet, and physical activity variables at baseline and postintervention, by intervention group. These adjusted means were calculated from the linear mixed model for each variable and controlled for the clustering of staff within schools. As shown in Table 3, the intervention resulted in a significant change in BMI: school employees in intervention schools reduced their BMI by an average of 0.14 kg/m^2, whereas employees in control schools increased their BMI by an average of 0.42 kg/m^2 (intervention effect=–0.561; $P<.05$). For a person with the average height in the sample (5 feet 4 inches), this is equivalent to a reduction of 0.82 pounds for employees in intervention schools and a gain of 2.45 pounds for those in control schools. The intervention did not have a significant effect on waist–hip ratio, weekly minutes of physical activity, or fruit and vegetable consumption.

The means for the anthropometric, diet, and physical activity variables, adjusted for age, ethnicity, and job classification, are presented in Table 4. These adjusted means were calculated from the linear mixed model for each variable and controlled for the clustering of staff within schools. Consistent with the models in Table 3 without these additional covariates, there was no significant difference between intervention and control groups for waist–hip ratio, weekly minutes of physical activity, or fruit and vegetable consumption. For BMI,

TABLE 3—Anthropometric, Diet, and Physical Activity Variables at Baseline and Postintervention of Participants in an Obesity Intervention for Elementary School Personnel, by Intervention Condition: Los Angeles, CA, 2005–2007

Variable and Time	Control	Intervention	*P*
BMI, kg/m^2			.047
Baseline, mean	27.56	28.54	
Postintervention, mean	27.98	28.40	
Change	+0.42	−0.14	
Waist–hip ratio			.565
Baseline, mean	0.87	0.86	
Postintervention, mean	0.87	0.87	
Change	0.00	+0.01	
Metabolic equivalent minutes of physical activity per wk, square root			.285
Baseline, mean	33.59	36.87	
Postintervention, mean	35.91	36.51	
Change	+2.32	−0.36	
Fruit and vegetable daily servings, square root			.619
Baseline, mean	2.11	2.07	
Postintervention, mean	2.13	2.14	
Change	+0.03	+0.07	

Note. BMI = body mass index (weight in kilograms divided by height in meters squared). Cases with missing data were removed by casewise deletion. Sample sizes were as follows: for body mass index, n = 337 for control and n = 339 for intervention; for waist–hip ratio, n = 339 for control and n = 342 for intervention; for physical activity, n = 324 for control and n = 326 for intervention; for fruit and vegetable servings, n = 340 for control and n = 332 for intervention. Percentages are adjusted for the clustering of staff within school worksites. *P* value is for the test of the interaction of intervention × time.

the difference between intervention and control remained significant (intervention effect = −0.564; $P < .05$). Employees in intervention schools reduced their BMI by an average of 0.04 kg/m^2, whereas those in control schools increased their BMI by an average of 0.37 kg/m^2. For a person with the average height in the sample, this is equivalent to a reduction of 0.23 pounds for employees in intervention schools and a gain of 2.15 pounds for those in control schools.

DISCUSSION

A participatory process was used to develop and implement an intervention appropriate for school personnel, with the goal of reducing obesity via healthy dietary and exercise behaviors. Obesity, physical activity level, and fruit and vegetable consumption of employees at 16 elementary schools were assessed at baseline and postintervention (2 years later). At 8 of the schools, worksite wellness programs for school employees were developed and implemented, while the other 8 schools served as control sites. Employees in the intervention schools slightly reduced their BMI after exposure to the intervention, whereas employees in the control schools showed a slight increase in BMI ($P < .05$), but the groups did not differ by waist–hip ratio. We assume that duration of exposure to the intervention was constant, as postintervention data showed that all respondents in the intervention schools were aware that workplace health promotion activities had taken place and 70% indicated they had participated. Although the magnitude of difference in BMI between groups was small (less than 3 pounds for a person of average height), the effect remained when age, ethnicity, and job classification were included in the model. Thus, the intervention may have slowed, and perhaps reversed, the tendency for adults to gain weight progressively with age.

The hypothesis that physical activity and fruit and vegetable consumption would increase among employees at the intervention sites was not supported. Fruit and vegetable consumption was relatively high before the intervention, which possibly created a ceiling effect. Caloric intake is more strongly associated with weight than fruit and vegetable consumption, and might have been a more sensitive indicator of dietary change. Regarding physical activity, the IPAQ is well-validated in community-based studies but may not have captured the level of change among these participants. Most were moderately physically active before and after the intervention. Although the desired change in BMI was achieved, it does not appear that the effect was mediated primarily through fruit and vegetable consumption or physical activity.

The findings from this research highlight the potential of health promotion in school worksites, a population that on average is well-educated and has a high household income. A previous study in the same school district showed that less than one third of schools had any wellness activities for their employees.[22] Because of limited resources at the district level for the staff wellness component of the Coordinated School Health Model, local efforts at individual schools are the most likely avenue for implementing health promotion activities. In this largely minority sample (45% Hispanic and 10% African American), about two thirds of the respondents were overweight or obese. Incorporating effective and cost-efficient health promotion activities into work environments such as these is an imperative consistent with the surgeon general's goals.[5]

The participatory process used in this study appeared to be an effective means of stimulating change. As the actual intervention varied across sites, it is not possible to determine which health promotion activities had the most impact. Nonetheless, encouraging creativity in approach and fostering a sense of ownership of the program were incorporated as strategies for sustaining the intervention beyond the funded period. A crude estimate of the cost of this program was derived from the expenses of the intervention, the number of eligible respondents, and the number of staff in . . . the 82 schools . . . that actually participated in any activities. The average annual cost was $146 per staff member and $256 per participant, indicating that this was a cost-efficient

TABLE 4—Adjusted Anthropometric, Diet, and Physical Activity Variables at Baseline and Postintervention of Participants in an Obesity Intervention for Elementary School Personnel, by Intervention Condition: Los Angeles, CA, 2005–2007

Variable and Time	Control	Intervention	*P*
BMI, kg/m^2			.048
Baseline, mean (SE)	27.60 (0.048)	28.46 (0.049)	
Postintervention, mean (SE)	27.97 (0.039)	28.42 (0.039)	
Change	+0.37	−0.04	
Waist–hip ratio			.676
Baseline, mean (SE)	0.87 (0.001)	0.86 (0.001)	
Postintervention, mean (SE)	0.87 (0.001)	0.87 (0.001)	
Change	0.00	+0.01	
Metabolic equivalent minutes of physical activity per wk, square root			.326
Baseline, mean (SE)	33.46 (0.093)	36.90 (0.094)	
Postintervention, mean (SE)	35.88 (0.086)	36.36 (0.092)	
Change	+2.42	−0.54	
Fruit and vegetable daily servings, square root			.685
Baseline, mean (SE)	2.11 (0.003)	2.07 (0.003)	
Postintervention, mean (SE)	2.13 (0.002)	2.15 (0.002)	
Change	+0.02	+0.08	

Note. BMI = body mass index (weight in kilograms divided by height in meters squared). Data were adjusted for age, ethnicity, and job classification. Gender was included in initial regression models but was removed because it was unrelated to change from pretest to posttest in the measured outcomes. Cases with missing data were removed by casewise deletion. Sample sizes were as follows: for body mass index, n = 337 for control and n = 339 for intervention; for waist–hip ratio, n = 339 for control and n = 342 for intervention; for physical activity, n = 324 for control and n = 326 for intervention; for fruit and vegetable servings, n = 340 for control and n = 332 for intervention. Percentages are adjusted for the clustering of staff within school worksites. *P* value is for the test of the interaction of intervention × time.

intervention for employees of urban schools in impoverished neighborhoods.

There were several difficulties in implementing this study. Some of the schools were on a year-round calendar, adversely affecting scheduling and continuity of membership on the wellness committees. Although the pervasive sentiment among the most involved members of the committees was that the program was an opportunity to collectively improve health, a less common but competing sentiment was that the program was a burden. Issues surrounding the latter sentiment were compounded by poor communication between committees and principals at some sites and union actions at others.

Regarding the study design, using school sites rather than individuals may have enhanced external validity at the expense of internal validity. Evaluating outcomes at the school level allows for an assessment of change stimulated by any aspect of the work environment and increases confidence in generalizing these findings to other work settings. On the other hand, participation in postintervention data collection was not dependent on either participating in baseline data collection or in involvement with the intervening health promotion activities. Thus, "exposure" to the intervention may have varied across individuals.

This concern was partially addressed by additional analyses (not shown) in which individuals with *only* baseline data were assumed not to have changed from baseline to postintervention (i.e., we substituted baseline values for missing postintervention data). In these analyses, the significant intervention effect remained for BMI. For the data presented in the Results section, analytic procedures were used that allowed for unequal numbers of observations at each time point and drew from the maximum information available.

Overall, this participatory intervention resulted in a modest improvement in health status and possible unmeasured secondary gains, such as improved morale and increased productivity. Healthy school personnel have the potential to serve as role models for students, reinforce positive health messages, and create a healthy school community.[8] ■

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Contributors

J.M. Siegel served as principal investigator, supervised the study, and led the writing. M.L. Prelip served as co–principal investigator, supervised the study, and contributed to the writing. J. Toller Erausquin conducted the data analyses and contributed to the writing. S.A. Kim served as the liaison with the study sites and contributed to the writing.

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Human Participant Protection

The protocol for this research was reviewed and approved by the institutional review boards of the University of California, Los Angeles and the Los Angeles Unified School District.

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