

Our Healthy Block: Evaluation of a Community-Based Healthy Eating and Physical Activity Intervention

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Abstract

Background: Philadelphia has a high prevalence of hypertension, heart disease, diabetes and obesity. To reduce chronic disease, there is a need for targeted, innovative community-based interventions to improve the food and physical activity environments for urban residents. This case study describes the development and evaluation of a pilot program to address barriers to healthy food access and physical activity environments in a West Philadelphia neighborhood.

Community context: The Our Healthy Block (OHB) intervention took place on three blocks in West Philadelphia. Project staff worked closely with the local community association and the neighborhood Community Development Corporation.

Methods: The intervention was informed by a community advisory board and by findings from a mixed-method study of food and physical activity environments in the same community. Project staff facilitated block-based events and other activities in the neighborhood, working with Block Captains. Evaluation included baseline and follow-up surveys of residents, tracking of activity participation and ratings, and interviews.

Outcome: Block-based events were well attended, but fewer residents attended activities at locations outside the block areas. Surveys revealed a trend toward reduced consumption of high-fat foods. There were no significant changes in other key outcomes.

Interpretation: Overall, the OHB intervention was well received, particularly when activities were hosted on participating blocks. To maximize participation and impact nutrition and activity behaviors, events should be held in close proximity to residents' homes. The program impact was limited by lower participation at other locations and by communication challenges and time constraints of community partners and residents.

Background

Overnutrition, unhealthy food choices, and physical inactivity contribute to increasing rates of obesity, and related morbidity and premature death from cardiovascular disease, diabetes, cancer, and other causes in the U.S [1]. Neighborhood environments may be particularly important to food choice behaviors and physical activity or inactivity [2] and to successful health-enhancing lifestyle changes [3]. Research about the impact of the nutrition environment on eating behavior indicates that local availability of healthy foods influences what people eat and may help explain racial and economic disparities in healthy food access, consumption, obesity rates, and chronic disease [2]. For example, using data from an urban food environment audit and a survey of residents' food shopping behaviors, Cannuscio and colleagues found that, based on objective measures, less diverse and less healthful foods are available at supermarkets where lower-income residents shop. They also found that race- and income-based disparities played an important role in food purchasing behaviors [3,4]. In addition, neighborhood characteristics such as the availability of sidewalks, accessible routes to local destinations, and safe pedestrian infrastructure influence residents' engagement in physical activity [2].

To date, very little research has applied the current understanding of the complex determinants of eating and activity behaviors to evaluating neighborhood-based interventions to improve obesity-related environments, but this research is essential to understanding neighborhood effects on nutrition, activity and obesity [5]. The premise for this work is the authors' beliefs that a community based research model that engages an established community coalition and local community leaders can address local issues, thus leading to higher rates of engagement and commitment among community leaders and participants, as well as solutions that are culturally relevant and sustainable.

Objectives

The primary aim of this project was to engage community members in designing policy and environmental changes to prevent or reduce obesity, based on a multi-method study that used

novel methods from multiple disciplines to measure and model access to healthy foods and active living for residents in an urban environment. The methods included a novel combination of door-to-door interviews, neighborhood mapping, survey research, community participation, and civic engagement. The project drew on the disciplines of nutrition, urban planning, social psychology, and political science. This case study describes how the project team worked with community members to design and evaluate a pilot intervention to address barriers to healthy food access and physical activity in a mixed/low-income neighborhood in Philadelphia. The ultimate goals of the intervention were to improve food environments in residents' homes, improve their eating and activity habits, and to decrease rates of overweight and obesity.

Community Context

Community-Based Participatory Research (CBPR) is a common strategy for public health researchers seeking to positively impact the communities in which people live. Several studies have highlighted the benefit of door-to-door methods in building relationships with community leaders and residents and building trust and engagement among study participants in CBPR [5,6]. The Our Healthy Block (OHB) program was guided from the start by a Community Advisory Board (CAB) for the exploratory phases (surveys, interviews, mapping and store audits) and during the intervention design and evaluation phase, when the local community association was also actively involved. This project began with a door-to-door survey and feedback on the results, to help build rapport with the community, including hiring community members to assist with data collection [6]. To gain a more thorough understanding of the neighborhood ecology, audits of all the neighborhood food stores were conducted [3,7] and in depth interviews of a sample of survey respondents were also conducted [4]. The CAB and the community association then worked with the research team to design and evaluate a pilot intervention to address barriers to healthy food access and physical activity in two mixed-income neighborhoods in Philadelphia. Further, community residents participated in data collection for the evaluation and CAB members also helped to interpret the findings and write up the results in this publication. (The second author is a resident of the community and worked as a full team member).

The OHB intervention took place on three blocks in the Walnut Hill neighborhood of West Philadelphia. The residents of this census tract are predominantly African-American (76%). About half of the households are families and about half of those have children under the age of 18. Most residents rent (87%) rather than own their homes and are low- to middle-income. The median age of residents is 31.8 [8].

Methods

Identification of community partners

A local resident who had worked on many community-based participatory research projects in the neighborhood connected the research team with local residents to convene a Community Advisory Board (CAB) to help facilitate this project. The CAB met 6 times in the year leading up to the intervention. This group included individuals from different races and income groups in the target areas. The CAB provided guidance regarding the type of intervention and helped to identify candidate blocks in West Philadelphia for the project. The

CAB preferred an intervention framed at the block level, because of traditionally strong "block" identities in Philadelphia and the presence of block captains, local neighborhood leaders who represent the residents and help to organize block-based activities and advocacy. In addition, the block captains noted the importance of engaging the Walnut Hill Community Association (WHCA) to reach the local block captains. The WHCA emerged as an important community partner and connected the project team with the five captains whose blocks were considered for inclusion in the intervention. In consultation with the WHCA, three of the five blocks were chosen for the program.

WHCA also had strong ties to the local Community Development Corporation, The Enterprise Center. The Enterprise Center facilitates a job training program called Community Leaders, which focuses on effective communication, customer service, problem solving, community awareness, and service leadership. These Community Leaders contributed to the project by collecting survey data and facilitating block events.

Training

There were several training sessions for community members who worked on the project. The Community Leaders received data collection training which is outlined later in this case study. The Block Leaders also received a brief Human Subjects training as well as training in completing process documents for the intervention.

Study participants

Community Leaders canvassed each of the blocks and identified those residents willing to complete a baseline survey. In order to be eligible- participants needed to be 18 years or older, a resident of one of the three identified blocks, and able to read and speak English. However, any adult resident of the three blocks could participate in the intervention activities, whether or not they had completed a baseline survey. In order to assure that their blocks were interested in participating in the intervention, block captains were asked to submit a petition signed by their residents to demonstrate resident interest in participating. Three block captains completed this task.

Survey development

To better understand the barriers to healthy eating and physical activity patterns, we conducted a survey that assessed both individual and environmental factors considered important to obesity risk. The survey adapted the NEMS-S [7], a survey previously used as a food environment auditing tool, to understand not only the food environment but also how individuals interact with their environment [7]. Other survey items were adapted to ensure that the wording of questions was relevant to the urban environment and to the neighborhood-based goals and strategies of the intervention. The self-report survey included items about demographic characteristics, nutrition and eating, shopping habits and eating away from home, physical activity, respondents' perceptions of their neighborhood built environment, social capital and social support in the neighborhood, and individuals' height and weight. The main outcome variables for the evaluation were healthy food and activity choices, unhealthy food and activity choices, and BMI.

Demographic information: Individual questions included sex, age, ethnicity, household size, marital status, children in the home, work

status, level of education, home ownership, car ownership, benefits, household income, and length of time living on block and were adapted from the Healthy Food and Activity Landscapes Household Survey [6].

Nutrition and eating: Survey questions about individual eating behaviors, including daily servings of fruits and vegetables, were adapted from the CDC's Behavioral Risk Factor Surveillance System Survey [9]. A question about the frequency of eating high fat foods was adapted from the National Cancer Institute Fat Screener Quick Food Scan [10]. Questions about food available at home and the family eating environment were adapted from previous studies on these issues [11,12].

Shopping habits and eating away from home: One question asked about the type of store at which participants did most of their shopping. Other questions queried where participants usually purchase fruit and vegetables, how far from home are the main places they shop, and how many times participants eat away from home or get takeout [13]. Two questions about family dinner and television viewing habits were also included and were adapted from the Healthy Rural Communities Study [13].

Physical activity: Questions about physical activity in the last 7 days were adapted from the International Physical Activity Questionnaire [14]. Questions about the home physical activity environment were adapted from previously published work [15].

Neighborhood/Block environment: Questions about neighborhood nutrition assets were adapted from Moore, et al., Echeverria, et al., and Caldwell, et al [16]. Neighborhood physical activity asset questions and perceived barriers to a healthy neighborhood were adapted from the Saint Louis Environment and Physical Activity Instrument [17-19].

Social capital, social support, activism in supporting a healthy lifestyle: Questions about neighborhood relations were also adapted from Brownson and colleagues and the Public Health Management Corporation's (PHMC) Southeastern Pennsylvania Household Health Survey [17-20]. Participants were asked about their ties to their neighbors as well as levels of trust among neighbors.

Individual weight and height: Questions about self-reported height and weight [9] were asked to calculate individuals' Body Mass Index (BMI).

Data collection

Survey data were collected by 6 participants in The Enterprise Center's Community Leaders program (described above). Each Community Leader completed Human Subjects training and became certified through the CITI Program and also received training in informed consent, eligibility, and survey administration.

Community Leaders canvassed each of the 3 blocks in pairs. They recruited participants, determined eligibility, administered surveys, and distributed gift cards to residents who completed the survey. The survey took approximately 15 minutes to complete.

Intervention activities

Once the baseline surveys were completed, the research team created a menu of activities in which residents could participate. Activities included nutrition classes, fitness classes, a healthy eating

challenge, a walking group, a scavenger hunt, an advocacy workshop, and a healthy dish cook-off. The activities were created by the project team with community input or adapted from publicly available and credible websites (e.g., from state and federal governments or supported by established foundation-funded programs) and evidence-based program strategies. The activities took place across a three-month period and involved between 6 and 18 hours duration for each block, depending on resident levels of demand and participation.

A self-administered Home Nutrition and Physical Activity Audit was a key part of the intervention. Residents completed questions about what foods and physical activity equipment were available in their home, and questions about shopping and meal preparation habits. A Healthy Action Checklist was provided so residents could choose specific areas to focus on. Suggestions were given within the audit forms on how to improve choices around eating, grocery shopping, meal preparation, physical activity, and electronic device use. The Audit was adapted from the goal-setting tools used in the Healthy Rural Communities Study, [13] and was pre-tested to ensure that residents could use it without professional supervision.

Two intervention kick-off events were held in late June and early July 2013. All the blocks were closed off to street traffic. Zumba exercise instruction was offered and a nutrition quiz game was administered. Research staff shared information about the program and residents had an opportunity to vote on which activities they would most like to be part of in their neighborhoods.

The research team scheduled activities based on the residents' votes, including: a Meet the Farmer Workshop, where residents had the chance to meet the farmer from their local urban farm; a Healthy Eating Challenge, which residents completed on their own and included suggestions of how to increase fruit and vegetable intake; Zumba and strength training classes, at a church within walking distance of the block; a Nutrition Education workshop; and a weekly Walking Group. Block-based events much like the kick-off events were held again in August along with nutrition quiz games, Zumba, and healthy foods.

Promotion and outreach

The research team distributed flyers about OHB door-to-door and reached out to participants via phone about upcoming activities. The Block Leaders also reminded their neighbors about events and activities face-to-face or by phone.

Process measures

Tracking, ratings, and survey items and interviews: Sign-in sheets were utilized at every event. Block leaders were also asked to keep track of the time they spent working on the intervention. Block leaders filled out a training evaluation as well as evaluations for individual activities.

The follow-up survey included questions about awareness of and participation in the program and activities. Block leaders and Community Leaders were interviewed in order to collect their feedback. The interviews asked about the leaders' experiences, reactions, and opinions of their block residents' reactions to the Our Healthy Block intervention components. Block leaders also completed an overall intervention survey during which they provided feedback on block closure events, healthy lifestyles activities, handouts, and activity materials.

Table 1: Demographics and Baseline Survey Data (n=71).

	% (n) or mean (sd)
Age (in years)	47.4 (18.4)
Gender	
Female	65.7% (46)
Race	
Black/African American or Other	88.4% (61)
Marital Status	
Married or living with a partner	23.2% (16)
Separated/divorced or widowed	15.9% (11)
Single	60.9% (42)
Government Assistance	
No	55.7% (39)
Highest Level of Education	
Some high school or less	14.5% (10)
HS graduate/GED or technical school	53.6% (37)
College graduate/Graduate degree	31.9% (22)
Hours worked outside the home for pay	
None	41.4% (29)
Part-time	30% (21)
35 hours or more	28.6% (20)
Household Total Yearly Income	
Less than \$15,000	28.4% (19)
\$15,000 - \$49,000	53.7% (36)
\$50,000 or more	17.9% (12)
Length of time living on Block	
Up to one year	16.2% (11)
Between 1 and up to 5 years	23.5% (16)
6 or more years	60.3% (41)
Household ownership	
Yes	67.1% (47)
Drivable Vehicles in Household	
None	42% (29)
1 vehicle	42% (29)
More than 1 vehicle	15.9% (11)
Purchase most Food	
Supermarket or Supercenter	15.9% (10)
Other (small grocery store, corner store)	84.1% (53)
Usually purchase fruits and vegetables	
Supermarket only	42.4% (28)
Supermarket and other	30.3% (20)
Other only	24.2% (16)
Don't buy	3% (2)
Distance to main shopping place	
Less than 5 miles	77.6% (52)
6 or more miles away	22.4% (15)

Results

A total of 108 participants completed the baseline survey and 71 (65.7%) of those who completed the baseline survey also completed a follow-up survey.

Table 1 shows the demographic characteristics of survey respondents. A non-response analysis was conducted to examine whether the 37 participants who only completed the baseline survey were significantly different from those who completed both surveys. The demographics for those participants were very similar to those who completed both surveys with the exception of the amount of time living on the block; 44.8% of those lost to follow-up reported living on the block for less than a year, compared to 16.2% of people who completed the follow-up survey. Non-responders to the follow-up survey were dropped from further analysis.

Table 2 shows baseline and follow-up responses for the main outcome variables. Changes in daily servings of high fat food (i.e. bacon, cheese, fries, mayonnaise, dressing, butter) improved between baseline and follow-up ($p < 0.01$). Availability of unhealthy foods in the home decreased slightly (from 7.1 to 6.6, $p = 0.22$) and minutes of vigorous activity increased slightly (from 241.3 to 281.9 minutes, $p = 0.13$), though neither shift was significant. There were no changes in the social capital measures. While the block-based events were well attended (6/29/13 and 7/4/13 $n=55$; 8/17/13 $n=38$), participation in the individual intervention activities was very low, ranging from 0 to 2 residents. The walking group, nutrition workshop, and Zumba and strength training classes were canceled due to lack of participation.

Residents' open-ended feedback on the follow-up surveys indicated that the program was well-received:

Table 2: Weight Status, Nutrition and Eating Behaviors, and Physical Activity (n=71).

	Baseline	Follow-up	
	% (n)	% (n)	p-value*
Weight Status – Females (n=46)			
Normal (18.5 – 24.9)	42.4% (14)	48.5% (16)	0.81
Overweight/Obese (25+)	57.6% (19)	51.5% (17)	
Weight Status – Males (n=24)			
Normal (18.5 – 24.9)	46.1% (6)	46.1% (6)	1.0
Overweight/Obese (25+)	53.9% (7)	53.9% (7)	
Nutrition and Eating			
Daily Servings of Fruits and Vegetables	8.1 (3.8)	7.9 (3.6)	0.77
Daily Servings of High Fat Foods (i.e. bacon, cheese, fries, mayo, dressing, butter)	1.4 (0.8)	1.0 (0.6)	≤ 0.01
Availability of healthy food in the home	7.1 (2.5)	6.6 (2.2)	0.22
Availability of unhealthy food in the home	4.3 (1.6)	4.0 (2.0)	0.16
Physical Activity			
Minutes of Vigorous Activity (per week)	241.3 (184.7)	281.9 (207.9)	0.13
Minutes of Moderate Activity (per week)	264.3 (181.7)	235.9 (159.1)	0.19
Minutes of Walking (per week)	282.3 (175.7)	272.2 (182.1)	0.65
Minutes of Sitting (per week)	250.2 (132.0)	267.6 (150.6)	0.37

*paired t-test.

“Thank you for bringing this to our community. I think it is very important for more people to be aware of the importance of their health.”

“I think the Healthy Block program was and is a good project for our neighbors because it brings awareness to healthy eating and lifestyles and also it brings us closer together in unity.”

“I obtained information that helps me start a healthy way of living. I can thank your program for that.”

Interviews with each of the three block leaders to gather their feedback about the program revealed overall positive feedback:

“Brought awareness to me that I didn’t really know.”

“Positive one. The focus is good.”

“Informative, good experience. Meeting different people, getting involved with neighbors, from UPenn, it was a great experience.”

The block leaders also commented on the challenge of achieving high participation levels among residents. They offered several reasons that may have contributed: the weather, residents with very small children, and time conflicts for working people. They suggested that the block captain’s direct involvement was key to gaining participation, but challenging because of the block captains’ many tasks and responsibilities.

Conclusion

Rooted in the findings from exploratory research in the community, the objective of the Our Healthy Block (OHB) intervention was to work closely with community members to design and evaluate a pilot intervention to address barriers to healthy food access and physical activity in a predominantly African American, mixed-income neighborhood in Philadelphia. The ultimate behavioral and health goals of the intervention were to improve diets, activity and weight.

Based on the participation levels at the events held on the block as well as the feedback from the block leaders, it is apparent that incorporating activities into a block event held directly outside people’s homes has the potential to garner substantial participation. Even though the non-adjacent intervention activities were held within 5 to 6 blocks of the three participating blocks, participation was significantly higher when residents did not need to leave their block.

Community leaders were engaged in planning the program from the start, and residents and block leaders voted on the activities in which they wanted to participate. As is often the case in such a program, many final details of the intervention were ultimately executed by project staff. Reviewing the feedback from participants, more opportunities for input was a common theme. However, this presented unique challenges, because it was difficult to ask for more time and energy from the residents and block captains, and it was difficult to achieve continuity of involvement from community members. Thus, a communication gap between the project staff, community partners and residents regarding ultimate planning and program roll-out emerged as a barrier.

In this pilot program, only modest behavior change was achieved. This is to be expected, given the short-term nature of the program

and the relatively low intensity of the activities. While well attended, the block events by themselves were not impactful enough to cause significant change in most of the residents’ nutrition and physical activity behaviors. Future expansion of this program should build on the lessons learned in this pilot program. This project illustrates successes and challenges to campus-community partnerships and demonstrates the feasibility of working with naturally existing neighborhood structures to improve environmental correlates of healthy eating and physical activity.

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