

Process Evaluation of Baltimore Healthy Stores: A Pilot Health Intervention Program With Supermarkets and Corner Stores in Baltimore City

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Reduced access to affordable healthy foods is linked to higher rates of chronic diseases in low-income urban settings. The authors conduct a feasibility study of an environmental intervention (Baltimore Healthy Stores) in seven corner stores owned by Korean Americans and two supermarkets in low-income East Baltimore. The goal is to increase the availability of healthy food options and to promote them at the point of purchase. The process evaluation is conducted largely by external evaluators. Participating stores stock promoted foods, and print materials are displayed with moderate to high fidelity. Interactive consumer taste tests are implemented with high reach and dose. Materials developed specifically for Korean American corner store owners are implemented with moderate to high fidelity and dose. Results indicate that small food store-based intervention programs are feasible to implement and are a viable means of increasing healthy food availability and a good location for point-of-purchase promotions in low-income urban settings.

Keywords: *process evaluation; food stores; intervention; Korean American; corner stores; supermarkets; urban; obesity prevention*

Urban minority populations in the United States have disproportionately high levels of obesity and other diet-related chronic diseases (Flegal, Carroll, Kuczmarski, & Johnson, 1998; Melanson, McInnis, Rippe, Blackburn, & Wilson, 2001). Data from NHANES 2003-2004 indicate that African American adults have some of the highest rates of obesity of 45.0% and extreme obesity (Body Mass Index >40 kg/m²) of 10.5% (Ogden et al., 2006). The risk of coronary heart disease is higher in low-income neighborhoods when compared to more affluent neighborhoods (Diez Roux et al., 2001). The prevalence of diabetes among African Americans was 13.1% in 2005 (Centers for Disease Control and Prevention, 2005), with substantially higher diabetes rates than Caucasians (Marshall, 2005).

The high rates of obesity and diet-related chronic diseases among ethnic minority populations are related to environmental factors that increase the availability of and accessibility to high-energy and high-fat foods at the expense of affordable and acceptable healthier alternatives (French, Story, & Jeffery, 2001). Environmental factors are associated with diet-related chronic diseases and their risk factors (McNeill, Wyrwich, Brownson,

Health Promotion Practice
Month XXXX Vol. XX, No. XX, xx-xx
DOI: 10.1177/1524839908329118
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Clark, & Kreuter, 2006; Morland, Diez Roux, & Wing, 2006). In Baltimore City, inner city areas are notable for the relative absence of large grocery stores. Many residents lack personal transportation and rely heavily on small- and medium-sized food stores in their neighborhoods. Many of these stores lack variety of healthy food options and are usually more expensive than larger stores. In addition, there are many carry-out and fast-food restaurants in the city that offer fried foods and high-calorie foods at cheap prices (Gittelsohn et al., 2007). Most corner stores in Baltimore City are owned and operated by Korean Americans. The Korean American Grocers Association (KAGRO) estimates that there are more than 1,200 Korean American grocery stores in Baltimore City (<http://www.kagromd.com/>).

Health educators have long viewed food stores as a promising venue for providing health information and encouraging the purchase and consumption of healthy foods. Programs in food stores have the potential to

influence point-of-purchase decision making regarding household food choices. Supermarket intervention trials have shown success in improving consumer knowledge and increasing the purchase and consumption of healthy foods (Seymour, Yaroch, Serdula, Blanck, & Khan, 2004). Work in small to medium food stores in low-income urban settings is in its infancy, with a number of small pilot trials showing limited success in working with corner stores, bodegas, and small supermarkets (Cummins, Pettecree, Higgins, Findlay, & Sparks, 2005; Reger, Wootan, & Booth-Butterfield, 1999).

In the literature on food store diet interventions, three main strategies have been used: (a) creating supermarkets in areas where none currently exist, (b) upgrading the facilities of existing small stores to enable them to carry fresh produce and a wider range of healthy foods, and (c) increasing the availability of healthy food options at small stores using existing facilities. All of these strategies have their respective strengths and limitations: establishing supermarkets in low-income urban areas can take considerable time and cost (The Food Trust, 2004) and lack of ready transportation can still keep access low; improving the ability of small stores to stock healthier food options (e.g., by installation of refrigerators) is also costly and has difficulties associated with identifying suppliers and lagging customer demand; and increasing the availability of healthy foods may foster store owner resistance based on expected lack of consumer demand.

In Baltimore City, we chose the third approach. In our formative research (Gittelsohn et al., 2007), we identified several challenges to working in and with small food stores. The primary challenge articulated by small store owners was a "if they don't buy it, we don't stock it" perspective. Many store owners stated that the primary deterrent to stocking healthy food options was a lack of consumer demand. Furthermore, they said that when they did stock healthy foods, the foods were not purchased. Conversely, local community member consumers reported that they did not buy healthier foods in small stores because they were not available, and when available they were too costly or of poor quality. Thus a primary challenge of the Baltimore Healthy Stores program was to create both supply and demand for healthy foods.

BALTIMORE HEALTHY STORES INTERVENTION

The Baltimore Healthy Stores (BHS) food store intervention trial was conducted from February to November 2006 in nine East Baltimore stores. East Baltimore is composed of 21 census tracts. In 2000, the population

TABLE 1
Phases of the Baltimore Healthy Stores Program

<i>Phase</i>	<i>Theme</i>	<i>Behavioral Objective</i>	<i>Promoted Foods</i>	<i>Minimum Standard</i>
1: February to March	Healthy breakfast	Consume low-sugar, high-fiber cereals and low-fat milk	Low-sugar cereals: Cheerios, Wheat Chex, Toasted O's, Special K, Cornflakes, Kix High-fiber cereals: Wheaties, Wheat Chex, Grapenuts, Total Whole Grain, etc. Milk: 1% and skimmed milk	One type of low-sugar and high-fiber cereals One type of 1% or skim milk
2: April to May	Cooking at home	Use cooking spray for eggs, pancakes, and vegetables	Cooking spray	One type of cooking spray
3: June to July	Healthy snacks	Consume low-fat snack alternatives and fresh fruits	Fresh fruits: apple, bananas, oranges Low-fat snacks: baked chips, UTZ baked tortilla chips, low-sodium pretzels, etc.	One type of fruit One low-fat snack
4: August to September	Carry-out	Choose whole wheat bread Use low-fat mayonnaise, fat-free mayonnaise	Whole wheat bread, split-top bread Low-fat or fat-free mayonnaise	One type of whole wheat bread One type of low-fat or fat-free mayonnaise
5: October to November	Healthy beverage	Choose water or diet sodas over regular sodas	Diet Sodas Water	One type of diet soda; one type of bottled water

in East Baltimore was 91.4% African American and the median household income was \$17,067 (Baltimore Metropolitan Council, 2006). East Baltimore has many small businesses, which consist predominately of carry-out restaurants and corner and liquor stores. Other food sources include an indoor market and several supermarkets.

The BHS trial used a conceptual framework derived from social cognitive theory, which combines environmental, individual, and behavioral components (Bandura, 1986). The BHS program focused on changing the local food environment by directly influencing the availability of healthier food options in stores and increasing awareness of and skills for selecting and preparing these foods through point-of-purchase promotions. Exposure to the intervention was anticipated to lead to increases in knowledge, self-efficacy, and to behavioral intentions to select, prepare, and consume healthier foods.

The trial was conducted in two supermarkets and seven Korean American-owned corner stores, representing the main types of retail food establishments in East Baltimore. The BHS program ran in five themed phases, each about 2 months in duration and focusing on specific foods and food-related behaviors (Table 1).

We focused on corner stores and supermarkets as intervention venues as they are the most commonly used retail food sources in this setting. Store owners were requested to stock minimum quantities of healthy food options. To incentivize their stocking of promoted foods and to minimize their financial risk, all seven small store owners were provided with \$25 or \$50 gift cards for food wholesale stores during each intervention phase, and were supplied with cans of cooking spray, fruit baskets containing 5 pounds of fresh fruit and five to seven loaves of whole-wheat breads according to the size of stores at the beginning of Phases 2, 3, and 4, respectively. When promoted foods were given to the stores directly, the stores received the smaller \$25 gift card.

The selection of foods for promotion was based on a two-stage process. First, extensive dietary recalls from community members were conducted to identify the foods that contributed the most fat, sugar, and total calories to the diet (Sharma et al., in press). Second, three community workshops were conducted to identify alternatives to these foods. Workshops were organized and run by the lead author and the study team to prioritize which foods were the greatest problem and then to suggest and vote on healthier, affordable, and

culturally acceptable alternatives for each of the top mentioned foods. Workshop participants included East Baltimore community leaders, representatives from community organizations, and Baltimore city and Maryland state health and social services staff.

Within the stores, shelf labels (lower in fat, lower in sugar, higher in fiber, healthy choice), posters, fliers, and other print materials were used to promote these foods. During selected phases, limited numbers of incentive cards and coupons were given to store customers to increase initial demand. Ten incentive cards (“buy three of the BHS-promoted foods and get the fourth free”) were provided to each corner store owner during Phases 1 and 3, with the request to give them out to their regular customers. However, most corner store owners decided to retain the cards behind the counter out of concern that the customer would lose or misuse them. Store owners were asked to provide the free item to the customers and were reimbursed for the food by the BHS interventionist. Interventionists visited each of the intervention stores regularly and conducted taste tests, distributed food samples, fliers, giveaways, and interacted with visitors to explain the message for that phase and to answer queries.

Educational materials and a nutrition education session were provided in Korean to corner store owners to enable them to identify nutritious foods and include them in their diet as well in their store for their customers. General guidelines to encourage and support the stocking of healthier food options and cultural guidelines to encourage positive interaction between store owners and their customers were also provided as posters in Korean. Store owners were incentivized to initiate the stocking of requested healthier foods through the use of wholesaler gift cards and/or the provision of small amounts of the food for promotion.

The BHS program was associated with increased sales of healthy foods (Song et al., 2008b). Exposure to the program was associated with increased purchase of promoted foods and with improvements in cooking methods (Gittelsohn et al., 2008). This article presents the results of the process evaluation of the Baltimore Healthy Stores program. We use this information to present challenges and lessons learned about the implementation of a food store program in a low-income urban setting.

METHOD

Process evaluation assessments of health intervention programs are normally assessed according to three primary constructs: reach (the number of target audience members exposed to any component of the intervention),

dose (the number of times each target audience member was exposed to any intervention component), and fidelity (how well components of the intervention were delivered according to plan) (Steckler & Linnan, 2002). These definitions work well for programs with well-defined and accessible target populations, such as school classrooms. In urban community-based environmental interventions, it is challenging to assess reach and dose using these definitions, because of the difficulty in determining a measurable denominator. To address this issue, we decided on a set of standards for the numbers of people to be contacted in the community setting and the types of interactions preferred. These numbers were based on our previous work on two Apache reservations (Curran et al., 2005) and on four First Nations reserves (Rosecrans et al., 2007), where we were able to achieve psychosocial and behavioral impacts (Ho et al., 2008). Our intervention area (East Baltimore) has a population of approximately 55,000 persons. Reach was defined in our study as the number of East Baltimore residents contacted through the interactive sessions. We set a standard of reaching 5% of the total population (the number achieved in the Apache study). Dose was defined as the number of different intervention elements delivered to each of the visitors at the interactive sessions, including a long interactive visit (implying delivery of health messages), food samples for taste tests, flyers, and giveaways. We set a standard of 75% of participants in the interactive sessions receiving at least two of these four intervention components.

Instruments

Four instruments were used to collect the process evaluation data (Table 2). Process data were collected by trained public health graduate students, who did not participate in the delivery of the intervention.

Store visit evaluation form. The store visit evaluation form was to be completed a minimum of four times per phase per intervention store during all five phases by the process evaluator. It assessed fidelity by evaluating promoted food availability, accurate placement of shelf labels, and presence and visibility of posters and educational displays. The evaluator could provide textual remarks on additional factors (e.g., vendor shelving of snacks) contributing to the success or failure of the in-store implementation. Promoted food availability was assessed during and after its promotional phase. The stocking status of the promoted food before the promotional phase was assessed by a weekly food sales form.

TABLE 2
Baltimore Healthy Stores Process Evaluation Instruments

<i>Form</i>	<i>Administered by</i>	<i>Intervention Component</i>	<i>When Planned</i>	<i>Process Component</i>
Store visit evaluation	Process Evaluator	Stocks of promoted foods in stores	Minimum of four times per phase per intervention store	Fidelity (promoted food availability; placement of shelf labels, posters, displays)
Taste test observation	Process Evaluator	Observation of taste tests Distribution of food samples Display of visual materials	Half of all taste test per interactive sessions	Reach (no. and characteristics of participants) Dose delivered (no. of food samples, fliers, and giveaways distributed)
Interventionist log	Interventionist	Record of taste tests Distribution of fliers, food samples, and giveaways	A minimum of four times per phase in supermarkets and two times per phase in corner stores	Fidelity (duration of activity) Reach (no. of participants) Dose delivered (no. of food samples, fliers, and giveaways distributed)
Weekly progress report	Interventionist	Checking stocking status of promoted foods and placement of shelf labels, posters	At the end of each week per phase per store	Fidelity

Taste test observation form. The process evaluator conducted observations on approximately half of all taste tests performed by the interventionist during each phase. This instrument assessed the fidelity and reach of the taste tests and recorded the dose of visual communication materials delivered by the interventionist and received by community participants. The process evaluator observed the duration of the taste tests, recorded the number and types of taste test participants, including those missed, and made notes on the discussion content of the interaction. In addition, the process evaluation documented the number of food samples, fliers, and giveaways that the interventionist distributed. Finally, the process evaluator used this form to assess reactions to and interest level in the promoted food.

Interventionist log and field notes. The BHS interventionist kept a record of all store visits completed and what had been accomplished during that visit, including numbers of fliers, food samples, giveaways handed out, interactions with customers, and number and duration of visits. As part of the log, interventionists filled out field notes after each intervention visit, describing implementation of intervention, and interactions with store owners and customers.

Interventionist weekly progress report. The interventionist paid a visit to all of the stores at the end of each week of the promotional phase to see if the promoted food was being stocked and documented her findings in a brief text report. If promoted foods were not available, the interventionist would request the store owners to do so or inquire if they needed any assistance. The interventionist would ensure that the shelf labels are appropriately placed and if not, would place them under the correct foods and add new ones if the old shelf labels were not present or were damaged or faded. She would also check on the placement of the poster and if it were torn or faded, she would make arrangements to have it replaced.

Process Evaluation Data Collectors

Data collectors were trained to administer the store visit and taste test forms. In total, 158 process evaluation visits were made, an average of 31.6 visits per phase—or 3.5 visits per intervention store per phase. Supermarkets were visited with greater frequency than the corner stores, as interventionists were instructed to visit supermarkets more frequently than small stores because of their higher customer volume, with 4.4 versus 3.3 visits per phase, respectively.

TABLE 3
Fidelity for Availability of Promoted Foods and Placement of Shelf Labels, Posters, and Educational Displays by Phase

<i>Characteristic</i>	<i>Phase 1</i>			<i>Phase 2</i>		<i>Phase 3</i>		<i>Phase 4</i>		<i>Phase 5</i>
Foods promoted	Low-sugar cereals	High-fiber cereals	Low-fat milk	Cooking spray	Fresh fruits	Low-fat snacks	Whole wheat or split-top bread	Diet soda	Water	
Availability of foods during the phase (% times stocked)	91	91	67	100	98	5	52	100	100	
Shelf labels (% times shelf labels correctly placed)	84	84	50	88	77	9 ^a	10 ^a	58 ^a	NA	
Poster (% times posted)		30		94	95		69		19	
Taste tests observed (no.)		14		18	40		14		25	
Education displays (no.)		14		13	39		18		25	

Note: Total no. of store visits by the process evaluator: Phase 1 = 26; Phase 2 = 35; Phase 3 = 44; Phase 4 = 28; Phase 5 = 25.
a. Foods were restocked by vendors and so there was frequent misplacement of shelf labels.

Data Management and Analysis

The SAS 9.1 statistical software package (SAS Institute Inc., Cary, NC) was used to calculate summary statistics for the quantitative data. Stocking status of specific promoted foods was calculated as a percentage of times a food was available during the process evaluator’s store visits. Appropriate placement of shelf labels was reported as percentage of times the label was correctly placed under the promoted food whenever the food was available. Number of visitors, fliers, food samples, and giveaways is presented per visit and by phase so trends in implementation can be seen. We have reported the reach of the program based on the interventionist’s taste test logs. Reach, dose, and fidelity for each intervention component were calculated as percentage of a set standard met (when applicable). Low fidelity was defined post hoc as 0% to 49%, moderate as 50% to 74%, and high as 75% to 100%.

RESULTS

Stocking of Foods

Availability of promoted foods at baseline (i.e., 7 days before the commencement of the promotional phase) was determined using the weekly food sales data. The percentage of stores stocking the promoted foods prior to the start of the intervention was 67% (low-fat milk), 89% (high-fiber cereal), 89% (low-sugar cereal), 44% (cooking spray), 0% (baked or reduced-fat chips), 0% (low-sodium pretzels), 67% (fresh

fruits), 33% (whole wheat bread), 44% (split-top bread), and 100% (diet sodas and water), respectively.

The program achieved a moderate to high level of fidelity in terms of promoted food availability. Availability of promoted foods *during* the intervention phase ranged from 52% to 100%, with a mean availability of 86% across all food items, indicating high fidelity overall (Table 3). The greatest success was in Phase 3, where originally none of the stores stocked baked or reduced-fat chips and low-sodium pretzels, but at the end of the phase most of the stores stocked these promoted snacks. Success during this phase was largely due to interventionists actively interacting with the store owners and encouraging them to request their vendors to bring in the promoted snacks. Phase 4 was challenging as whole wheat bread was not in demand and we did not get a positive response to the taste tests. As suggested by store owners, we chose to promote split-top (mixed whole and white flour bread) over white bread.

Print Materials in Stores

We adapted to the small amount of wall and shelf space in corner stores by creating smaller versions of posters and shelf labels. Shelf labels were found to be incorrectly located on many occasions after external vendors had rearranged food stocks. We also had to think of creative solutions in the use of print materials to deal with the layout limitations of certain corner stores. For example, in two of the corner stores, the majority of customers were not permitted to enter the

TABLE 4
Reach and Dose of Taste Tests Delivered by the BHS Interventionists

<i>Phase</i>	<i>Total No. of Intervention Visits^a</i>	<i>Mean No. of Brief Visitors per Visit^b (Reach)</i>	<i>Mean No. of Long Visitors per Visit^c (Reach)</i>	<i>Mean No. of Food Samples per Visit</i>	<i>Mean No. of Fliers per Visit</i>	<i>Mean No. of Giveaways per Visit</i>	<i>Mean No. of Intervention Components Received per Visitor (Dose)^d</i>
1	14	7	5	11	1	3	1.7
2	23	8	8	1	10	21	2.5
3	39	7	5	23	9	8	3.8
4	73	15	3	6	16	17	2.3
5	48	4	9	22	9	8	3.7
Overall Mean		9	6	13	11	12	2.8

a. Standard was 22 store visits per phase.

b. 10 to 60 s duration.

c. >1 min duration.

d. Standard was minimum 2 components received by each visitor.

store itself, and so shelf labels were for the most part ineffective. In these settings, we devised additional posters and signage that indicated the availability of specific healthy foods in the stores.

Considerable variability was observed in the placement of print materials in stores during the trial (Table 3). Shelf labels were appropriately placed with moderate to high fidelity during the first three phases but showed low fidelity in later phases. Foods that were stocked by outside vendors (snacks, bread, and soda), were less likely to have accurately placed shelf labels, as vendors and store staff sometimes restocked foods without changing the location of the shelf label. Appropriate poster placement (in a visible location) increased in fidelity from Phase 1 to 4 but then decreased in the final phase, in which the interventionists relied on the store owners to put up posters.

Coupons and Incentive Cards

The coupons and incentive cards were distributed at corner stores only and were implemented with low reach and dose and moderate fidelity. Of the 60 and 40 cards handed out to corner store owners in Phases 1 and 3, respectively, only 25% and 13% were returned by the store owners for reimbursement. In Phases 2, 4, and 5, 50 to 60 coupons per phase (offering 50 cents to a dollar off a promoted food) were distributed to corner store owners. However, store owners infrequently gave them to their customers, so dose received was low and less than 20% of the coupons were returned for reimbursement by store owners.

Taste Tests and Other Interactive Activities

Standards for reach, dose, and fidelity were achieved for the taste tests (Table 4). The interventionists conducted a total of 197 taste test store intervention visits, representing 179% of the goal of 110 visits (goal: 22 visits per phase). The total reach was 2,942 interactions with participants (5.3%), achieving the standard for number of interactive session contacts. It must be noted however that the frequency of the taste test visits and numbers of participants varied considerably by phase and by store, depending on the availability of interventionists to do the store intervention visits. The ability to meet the standards set for number of store visits also varied by store, as some of the small stores kept highly irregular and unpredictable hours.

On average, each intervention visit included nine brief (10 to 60 s) and five prolonged (>1 min) interactions with consumers. Dose delivered was high, with an average of 2.8 of the intervention components delivered to each store visit participant, achieving the standard of 2+ intervention components delivered per contact. An average of 13 food samples were given away each visit, with a wide range by phase. An average of 11 fliers and 12 giveaways were given out each visit. On average, during a phase about 356 brief and 212 long visitors were reached, and 506 food samples, 451 fliers, and 491 giveaways (e.g., chip clips, water bottles, refrigerator magnets) were delivered.

Intervention Components Targeting Korean American Store Owners

Components of the BHS intervention targeting Korean American small store owners were implemented with high reach, dose, and fidelity. The Korean language nutrition education session was delivered to all seven Korean American store owners. Store owners interpreted the information primarily in the context of their own diet and food purchasing. The stocking and cultural guidelines were received by all store owners and all were posted/kept behind the counter for reference. As one store owner remarked, “We know how to welcome our customers. However, we often forget about that. I think these materials will remind me of that.”

DISCUSSION

To our knowledge, Baltimore Healthy Stores program is the first urban food store intervention trial to work with both large supermarkets and small neighborhood corner stores, and the first to provide detailed process evaluation data. The experience of the first year of intervention provided useful insights and there were many lessons learned. The most important for our purposes was that successful implementation of such a store-based program is feasible. The program was implemented overall with moderate to high fidelity, dose, and reach. Corner store owners and supermarket management worked with us to enable a successful program, permitting us access to their stores and to interact with their customers, and permitted the BHS team to contribute to their stocking decisions (Song et al., 2008a).

We were able to increase the availability of many of the healthier food alternatives in the stores during the intervention. It should be noted, however, that both supermarkets and several of the corner stores were already stocking certain of these food items. Other small store-centered programs have seen success in increasing the stocking of specific foods, such as milk (Reger et al., 1999) and fruits (Seymour et al., 2004).

Posters, fliers, shelf labels, and other print materials were implemented with high fidelity. On the other hand, incentive cards and coupons were weakly implemented, and were used by few store customers, owing in part to concerns of misuse expressed by store owners. These were used in the seven corner stores only, and a wider implementation of the approach to include supermarkets, where customers more often use coupons, might have had greater success. Nevertheless, we do not recommend their use in small store settings.

The taste tests and interactive sessions had high attendance and participation by customers, as they have in our other store programs (Curran et al., 2005; Rosecrans et al., 2007). The use of colorful displays, giveaways, and free samples were part of the success of this component. In the smaller stores, because of space constraints, it was sometimes challenging to find a satisfactory time to conduct the interactive sessions. Interventionists aimed to conduct taste tests at times when there would be many shoppers to interact with. However, some store owners did not want interventionists to conduct taste tests at those times, because there was the least space in the stores then. Despite these challenges, providing taste tests was essential for giving local consumers the opportunity to sample healthier food options and appears to have led to increased sales of these foods (Song et al., 2008b).

Probably the most unique aspect of this project was the development of intervention components directed specifically at the Korean American store owners themselves. All of the store owners in our study were first-generation immigrants, with variable English-language skills. Although there are harmonious aspects between corner stores and customers' cultural differences and misunderstandings with the local communities they serve do exist (Chang, 1999; Yoon, 1997). Our store owner-oriented intervention components were developed and delivered by a Korean doctoral student (H.J.S.) in the Korean language. We feel the high level of cooperation we received is related to the personal trust she developed with those store owners.

Supplying Korean American store owners with small incentives was essential to “prime the pump” in terms of initiating the stocking of key healthier foods. Most small corner stores in Baltimore have small profit margins, and there was initial resistance to stocking foods that owners were concerned would not sell. Korean American store owners have multiple strategies for obtaining foods, including the use of selected wholesalers, buying foods on sale at local supermarkets, and relying on vendors to drop off foods. This variation meant that each food required a different incentivization strategy. For foods that were purchased at supermarkets or wholesalers, we could supply a gift card. For foods that were supplied by external vendors (e.g., low-fat milk), we had to negotiate with both the store owner and the vendor. For foods that the store owners did not know how to access (e.g., cooking spray), we supplied a few units of those foods initially while working with store owners to locate a more regular supply. We recommend that future efforts to work with small stores to increase healthy food stocking be flexible in their use of incentives, depending on the type of foods targeted.

A final challenge related to intervention delivery. Owing to resource limitations, our interventionists were primarily public health students. Because of their busy schedules, each student was assigned only one to three stores and would visit stores when their schedules permitted it. Many interventionists left the university over the summer, such that most stores had two to three different interventionists over the course of the study. We recommend having the same interventionists throughout the study, working with the same stores, in order to build a prolonged positive relationship and promote consistency in the delivery of intervention components.

The study has limitations in terms of its assessment of process evaluation indicators. Working in a large urban community with many small stores, it was not feasible to track intervention reach and dose delivered to the entire target population (all of East Baltimore) in the traditional way (as a proportion of the total eligible population). Instead, we set standards for the number of contacts to be made (reach) and for the number of different intervention elements for each participant to receive (dose). Overall, we were successful in reaching these newly defined targets of reach and dose.

CONCLUSIONS

In conclusion, Baltimore Healthy Stores was successfully implemented in small and large stores in a low-income area of Baltimore City. Food store-based interventions in both small and large stores are a viable means of increasing the availability of health foods choices and for conducting point-of-purchase promotions targeting low-income minority populations in urban settings. Korean American stores are a special subgroup of food stores that should be explored as potential intervention sites, as they are often located in poor, ethnic-minority neighborhoods of cities. Strategies need to be adapted to specific types of stores depending on size, layout, and how store owners make decisions about stocking of foods, among other factors. Future research in other urban settings is needed to assess the best ways to approach and work with different types of food stores in a manner that will lead to their sustained stocking of healthy food options. Detailed process evaluation is essential to determining how well intervention approaches in food stores were implemented, and to determine best practices for further, expanded studies.

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