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Permalink

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Journal

Journal of Community Health, 40(2)

ISSN

0094-5145

Authors

Ortega, Alexander N
Albert, Stephanie L
Sharif, Mienah Z
et al.

Publication Date

2015-04-01

DOI

10.1007/s10900-014-9941-8

Peer reviewed

Proyecto MercadoFRESCO: A Multi-level, Community-Engaged Corner Store Intervention in East Los Angeles and Boyle Heights

Alexander N. Ortega · Stephanie L. Albert · Mienah Z. Sharif · Brent A. Langellier · Rosa Elena Garcia · Deborah C. Glik · Ron Brookmeyer · Alec M. Chan-Golston · Scott Friedlander · Michael L. Prelip

Published online: 11 September 2014
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Abstract Urban food swamps are typically situated in low-income, minority communities and contribute to overweight and obesity. Changing the food landscape in low income and underserved communities is one strategy to combat the negative health consequences associated with the lack of access to healthy food resources and an abundance of unhealthy food venues. In this paper, we describe *Proyecto MercadoFRESCO* (Fresh Market Project), a corner store intervention project in East Los Angeles and Boyle Heights in California that used a multi-level approach with a broad range of community, business, and academic partners. These are two neighboring, predominantly Latino communities that have high rates of overweight and obesity. Located in these two communities are approximately 150 corner stores. The project used a community-engaged approach to select, recruit, and convert four corner stores, so that they could become healthy community assets in order to improve residents' access to and awareness of fresh and affordable fruits and vegetables in their immediate neighborhoods. We describe the study framework for the multi-level intervention, which includes having multiple stakeholders, expertise in corner store operations, community and youth engagement strategies, and social marketing campaigns. We also describe the evaluation and survey

methodology to determine community and patron impact of the intervention. This paper provides a framework useful to a variety of public health stakeholders for implementing a community-engaged corner store conversion, particularly in an urban food swamp.

Keywords Food deserts · Hispanic health · Mexican · Environmental intervention · Convenience stores · Bodegas

Adequate consumption of healthy food is a major factor in the prevention of obesity, a contemporary public health problem disproportionately affecting low income, racial and ethnic minority, and underserved communities. People living in these communities often lack access to affordable, fresh, and unprocessed foods. One term used for this phenomenon is 'food deserts' [1, 2]. Another term applied to some urban neighborhoods is 'food swamps' defined as communities with a disproportionate amount of unhealthy food venues and choices [3, 4]. Both food deserts and food swamps are increasingly receiving attention in health disparities research and practice, as they have been correlated with high community-level overweight and obesity [5–8].

In response to the rise of obesity and obesity-related chronic diseases, such as diabetes and heart disease, public health researchers and practitioners have been working toward improving access to and purchasing and consumption of healthy food in food swamps. One promising strategy has been to improve the food environment by transforming corner stores so that they provide healthy food options to community residents [9–14]. There have been a range of strategies implemented to convert corner stores, of which some have included small changes to the inventory whereas others have done extensive physical remodeling of stores.

A. N. Ortega (✉) · S. L. Albert · M. Z. Sharif · R. E. Garcia · D. C. Glik · R. Brookmeyer · A. M. Chan-Golston · S. Friedlander · M. L. Prelip
Center for Population Health and Health Disparities, Fielding School of Public Health, University of California, Los Angeles, Los Angeles, CA 90095-1772, USA
e-mail: aortega@ucla.edu

B. A. Langellier
Health Promotion Sciences Division, Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ, USA

In this paper, we describe a multi-level community-engaged corner store intervention project in East Los Angeles (East LA) and Boyle Heights called *Proyecto MercadoFRESCO* (Fresh Market Project). These are urban communities that are approximately 95 % Latino, almost half (48 %) foreign-born, and with approximately 85 % of residents having Mexican heritage. East LA in particular is the largest, in terms of proportion, Latino community in the US [15]. These communities are food swamps with high concentrations of fast food restaurants and other venues that serve foods that are high in fat and sugar (e.g., taco stands, sweet-bread stores, other places selling tamales or fried food, as well as fast food franchises). While there are a few supermarkets, there are approximately 150 sole-proprietor owned corner stores in these communities. These small stores largely sell energy-dense foods, sugar-sweetened beverages, alcohol and little, if any, fresh fruits and vegetables.

A Multi-level Corner Store Intervention in a Food Swamp

Components for a Successful Corner Store Conversion

Three components guided our corner store intervention. First, East LA and Boyle Heights have histories of social action and strong community identities. Therefore, we engaged community leaders in our project from its inception. Second, we were able to retain a consultant who served as a project partner with expertise in corner store operations and retail of fresh produce. Third, we developed extensive social marketing and health education capacity among youth living in these areas, and they helped to promote the project (See Fig. 1).

Our multi-level, community-engaged design involved a broad range of stakeholders, or partners, such as business owners, schools, community-based organizations, local politicians, a local health center, a county public health department, and residents that each brought to the project their unique perspectives, experience and expertise (See Table 1). From the earliest stages, we prioritized creating a

strong network among our partners. These partners were identified because of their dedication to our shared goal of improving health in East LA and Boyle Heights. In addition to our community partners, we worked with an expert in corner store operations who was a former corner store owner and who had experience in converting stores into healthy stores. Our strong partnerships helped engage the community and store owners, at all phases of both the intervention and associated research, which is the cornerstone for a successful project. The project team engaged multiple community and academic stakeholders in formative research activities to determine community needs, demands, and interests. The community-engaged approach of the research project strived to cultivate a sense of ownership within the community, including store owners, residents, and organizations, that this was “their” project.

Unlike other food environment interventions in low income food swamps, our project also emphasized continuous community-driven social marketing and health education efforts as key intervention components [16]. Specifically, we prioritized building community demand for healthy fruits and vegetables by using a small media or narrowcast approach to attract new store patrons as well as to tout ongoing benefits of shopping local and learning to eat healthy [17]. For example, in addition to changing products sold and the physical appearance of each store, we also had ongoing activities such as cooking demonstrations and other community events.

Store Selection and Store Owner Participation

We defined neighborhood corner stores as sole-proprietor owned and managed stores that sell a variety of items such as groceries, snack foods, candy, soft drinks, and non-food items including tobacco products, alcohol, and lottery tickets. While stores eligible for conversion were able to sell liquor, they could not exclusively sell liquor. We also excluded stores that were attached to gas stations, which are typically known as convenience stores. Using Dun and Bradstreet and Reference USA listings, government agencies’ and other publicly available data (e.g., California Department of Public Health), as well as on-the-ground

Fig. 1 Three key components of a successful neighborhood corner store intervention

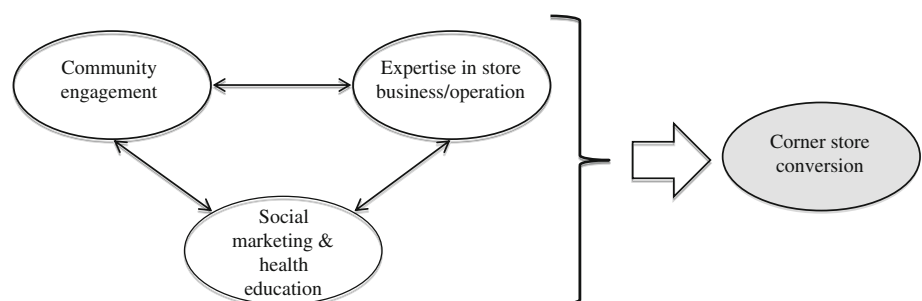


Table 1 Levels of partnerships developed by Proyecto MercadoFRESCO

Academic/research	Government	Business	Healthcare system	Community	Individual/family
UCLA	County department of public health	Corner store owners	Community health clinics	Community activists	Patrons
USC	Local government	Corner store conversion consultant		Civic and arts engagement organization	Community residents
Urban Institute	Law enforcement	Community bank		Community based organizations	Households
Scientific Advisory Board (SAB)	WIC			Rotary club	Principals/teachers
				Local health and education consortia	Students
				Local public high schools	

observations, we established a catalog of approximately 150 corner stores in the adjacent neighborhoods of East LA and Boyle Heights.

We considered the following criteria when selecting corner stores for conversion: (1) location in a residential area, (2) distance from a comprehensive grocery store/supermarket, (3) retail square footage of more than 500 square feet with ample room for produce refrigeration units and display cases, (4) sufficient customer flow, (5) patronage among neighborhood residents, (6) quality customer service, (7) clear need for physical transformation of the store, (8) low availability or absence of high quality fruits and vegetables in the store, (9) day-to-day store owner operation, (10) store owner buy-in, (11) regular hours of operation, and (12) absence of criminal activity in the immediate area. These eligibility criteria were identified a priori as necessary characteristics for an ideal intervention store, based on a review of the literature and recommendations by our corner store conversion consultant [1].

The consultant helped recruit local store owners to participate in the intervention. This process began with canvassing all stores initially identified in the neighborhoods to determine eligibility. A checklist was created using the criteria described above. The consultant visited the stores at multiple times and days of the week to observe the physical characteristics of stores (e.g., square footage, availability of space for produce displays) and to assess patronage and purchasing patterns, and delivery and product stocking patterns. Additionally, customer service was observed as an indicator of store owner engagement in the day-to-day operations of the stores.

The goal of the canvassing was to identify and recruit a total of eight stores, four to receive the intervention and four to serve as comparison stores. Intervention stores were selected based on eligibility criteria and store owners' willingness to participate. Once intervention stores were

recruited, suitable comparison stores were identified based on the eligibility criteria, geographic location (e.g., proximity to schools, location along a major road versus side street), and similarity to its matched intervention store (e.g., store size, location within its respective neighborhood, and types of food sold). Comparison stores were located roughly one mile from intervention stores. The decision regarding the location from where to recruit comparison stores was done a priori based on similarity to the intervention neighborhood and other geographic and socio-demographic characteristics of neighborhood residents. The distance was important in order to minimize the possibility that residents in the intervention neighborhood shopped at comparison stores or vice versa. Additionally, we selected comparison store neighborhoods that were separated from the intervention neighborhoods by two major freeways. Once a store was identified as an eligible intervention or a comparison store, the consultant approached the store owner to describe the overall project, explain participation requirements, and to secure participation and memoranda of understanding among participating owners.

Store Conversions

The conversions of the intervention stores started with site restoration. These activities included general repairs of the physical facility, exterior and interior paint jobs, adding windows and removing window bars to increase light, removing alcohol and tobacco marketing materials, installing refrigeration units for fresh fruits and vegetables, and providing security systems when needed (see Fig. 2). Stores' layouts were rearranged so that unhealthy items were moved to the back of the store while healthy items, such as the newly available produce, were featured near the entrance. Furthermore, in order to promote the purchasing and consumption of these healthy items, social marketing and health education materials, which were designed as

Fig. 2 Before and after photographs of a converted corner store



Fig. 3 Marketing materials displayed inside of a converted corner store



part of this community intervention, were displayed throughout the stores (See Fig. 3). The store conversions took approximately 1 month to complete and stores were able to remain open throughout the process.

Technical Assistance, Training and Maintenance

To facilitate engagement of the store owners and sustainability of the project, our team worked with store owners to improve their business skills and ability to market and sell healthy foods in their stores. For example, while corner store owners are used to stocking a non-perishable inventory, such as chips and candy, many owners lacked experience with perishable inventory including fresh produce. The technical assistance component for the store owners developed their skills to minimize waste, to keep supply consistent with community demand, and to cull or remove spoiled inventory. Additionally, we offered training in bookkeeping and accounting practices. Another key part of working with store owners was developing business relationships with produce wholesalers and local farmers markets. This relationship was important so that healthy food, such as fresh fruits and vegetables, could be sold to store owners at prices that maintain profitability for the owner yet prices charged are affordable for patrons. Furthermore, store owners were trained to negotiate with vendors who sell unhealthy items, such as soda, liquor, chips, and candy, so that their products are not displayed in the front of the stores, as these front areas are changed to display fresh fruits and vegetables and other healthy items. Store owners who agreed to participate as comparison stores also received training on improving bookkeeping and other business skills.

Community Advisory Board

Although members of our intervention team had long-standing relationships with East LA community agencies, we convened a new Community Advisory Board (CAB) to expand upon existing relationships and to identify new community partners for our project. CAB members included participants from the county's public health department, community health clinics, which included health providers and administrators, the Supplemental Nutrition Program for Women, Infants, and Children (WIC), public schools, social service agencies, law enforcement, small business owners, community activists, a community-based volunteer organization, a local service organization (e.g., Rotary Club), a local health and education consortia, and community residents. Community advisory meetings were conducted in both English and Spanish and held in community venues. Local businesses supplied food and space for the meetings. The CAB advised on study rationale and implementation,

study protocols, recruitment and retention efforts, participated in focus group and key informant interviews, and help raised community awareness about the project.

Scientific Advisory Board

We also convened a national Scientific Advisory Board (SAB) comprised of leading scholars in health disparities and community-based research, community-level food and nutrition interventions, survey science, health care delivery, Latino health and Chicano studies, and community arts. The SAB advised on study implementation, scientific impact, and policy and program relevancy. Together, with the input from the community, our SAB helped inform our project throughout the process.

Youth and School Engagement

Corner stores are often situated near schools, and students are common patrons of these stores. Therefore, participating corner stores were near local high schools facilitating the inclusion of high school students in our community health education and social marketing activities. To do this, we realized that taking a traditional, strict nutrition education approach would not motivate youth to be actively engaged. Thus, we framed the effort as a food justice and health disparities issue with media and social marketing components. In collaboration with local high schools, the YMCA, and an arts and civic engagement organization, we developed and implemented a variety of youth-led activities including outreach, health education and social marketing in the community. Our work with high schools involved partnering with teachers and principals at two local high schools and developing a semester-long elective course. The curriculum included components on nutrition, food justice, health disparities, media literacy, the creation of art and videos for social change, social advocacy skills, and social marketing strategies and techniques. Students not only learned about community food issues and intervention strategies but they also developed the skills necessary to participate in all intervention activities, including designing the new store layouts, physically converting the stores, assisting in short- and long-term store maintenance, and developing and disseminating social marketing and health education materials. They also increased their media literacy by learning about the ways large food corporations market unhealthy and junk foods.

As part of the training, we encouraged students to develop a brand name for the project. The students worked in teams and developed a public social marketing campaign. Students developed the project name, logo, and promotional materials (see Fig. 4). They named the project *Proyecto MercadoFRESCO* (Fresh Market Project).



Fig. 4 *Proyecto MercadoFRESCO* logo developed by high school students and civic and arts engagement organization

Social Marketing and Community Activities

After the students completed their training, they led and participated in frequent store- and community-based events (e.g., Friday night movie screenings at the park where students played their videos and performed theatrical skits, Mexican Independence Day parade, health fairs, and school and church presentations). The social marketing and community activities included designing and distributing health education and promotional materials. For example, the students developed posters, flyers, and calendars that promoted healthy eating in the community as well as in the converted stores. These materials were prominently displayed in the stores and were widely distributed throughout the community. The city's public works department provided free media space for displaying the youth-developed posters at local bus stop shelters (see Fig. 5). Videos that were created by the students on healthy eating and that promoted the converted stores were played on city buses and shown at community events and schools. Students also went door-to-door distributing store flyers and coupons to incentivize patronage and garner support for the stores. High school and public health undergraduate and graduate students worked with dietitians and nutritionists and organized most aspects of cooking demonstrations and nutrition education events conducted at the intervention stores. At these events, students would dress in colorful fruit and vegetable costumes that became well-recognized in the neighborhoods as part of *Proyecto MercadoFRESCO*. The students also developed and provided numerous promotional materials such as reusable shopping bags, healthy recipe cards, and store coupons all displaying project and store name and logo.

As part of the dissemination activities, students were trained in public speaking and presented the project and the importance of healthful eating and food justice at a variety



Fig. 5 Social marketing materials displayed on bus shelters

of community events (e.g., school assemblies and health fairs). They also spoke to a variety of media, including local news, National Public Radio (NPR), British Broadcasting Corporation (BBC) radio, and *CNN en Español*.

Academic and Career Pipeline

The corner store community intervention research project is affiliated with a larger research and training program that includes two different but complementary National Heart, Lung, and Blood Institute (NHLBI) training and career development programs (i.e. P50 and R25 grants) in health disparities research. In addition to involving high school students in their training and intervention activities, the students participated in academic advising and career development. Undergraduate, graduate, and post-doctoral students participated in these activities with high school students, giving them the opportunity to be both mentors and mentees.

In framing the intervention, we also aimed to increase community capacity and professional development beyond the intervention activities. We collaborated with a community-based organization called Volunteers of East Los Angeles (VELA) to identify, recruit, and train community residents in survey administration techniques. University investigators conducted training on standardized survey interviewing, human subjects and ethics, and data collection. The training and skill sets that were developed allowed the residents to apply for future employment at any major survey firm, thereby increasing professional development and opportunities.

Evaluation

To evaluate the impact of this intervention, we implemented a number of data collection efforts aimed at

capturing changes among neighborhood residents, store patrons, and other corner stores in the area. All study protocols were approved by the Institutional Review Board (IRB) of the UCLA Office of the Human Research Protection Program (OHRPP).

Community Survey

The study aimed to determine whether there were changes in community-level availability, purchasing, preparation and consumption of fresh fruits and vegetables, as well as to determine the profitability and sustainability of the corner store intervention. In order to assess changes over time, we employed a longitudinal design of households in the neighborhoods around the eight stores and conducted face-to-face computer-assisted personal interviewing (CAPI) in both Spanish and English depending on the respondent's preference. Interviews lasted approximately 1 hour. Interviews were conducted at baseline prior to the conversion of the store and then repeated approximately 1–2 years after the conversion. Participants were offered \$25 as an incentive.

The sampling plan of the community survey required interviews to be conducted with 125 household participants in each of the neighborhoods (i.e., corner store catchment areas) immediately surrounding the four intervention and four comparison stores. Participants were recruited into the community survey using the following sampling schema. First, we created a separate catchment area for each corner store used in the study by identifying the contiguous or nearly contiguous blocks closest in proximity to the corner store, typically totaling about 300 households per area and including blocks within 2–3 blocks of the target corner store. For the baseline interview, households were randomly sampled from each catchment area to secure at least 125 participants for a total of 1,000 completed interviews across all areas. Within a household, we selected and interviewed the adult (18 years or older) who identified as the primary purchaser or preparer of food for the household. If more than one adult was eligible, we interviewed the person who was available and willing to participate. Our American Association for Public Opinion Research (AAPOR) response rate (those who completed/ those who were eligible) at baseline was 80 %.

At time two, we went back to the same households interviewed at baseline and attempted to interview the same participant from baseline. If there was a new primary food purchaser/preparer in the home, we interviewed that person. If the family had moved and the new family had resided at that address for at least 1 year, we interviewed the primary food purchaser and preparer now living in the home, if he or she was willing and available to participate in the survey. If the household at time two (regardless of

Table 2 Community survey characteristics

Measure	n (%)
<i>Response rate</i>	
Baseline	1,035 (80) ^b
Follow-up ^a	424 (71) ^b
<i>Female respondent</i>	
Baseline	808 (78)
Follow-up ^a	352 (83) ^c
<i>Interview in Spanish</i>	
Baseline	626 (60)
Follow-up ^a	236 (56)
Same household at both time points ^a	337 (79)
Same person at both time points ^a	285 (67)

^a Follow-up measurements based on four stores

^b Based on AAPOR response rate 1

^c This value was estimated from the percentage of females sampled at both time points

old or new family) refused or was ineligible (e.g., the home was vacant, no food purchaser in the home), we interviewed a new eligible household from the sampling frame. While time two data collection is still ongoing, the preliminary response rate is 71 % (See Table 2).

Patron Survey

In addition to community-level changes, we were also interested in the direct impact of the corner store conversions on patrons who lived in the neighborhoods and frequented the stores. Specifically, we were interested in changes in the profile of those who frequented the stores, their food purchasing and eating behaviors, and nutrition knowledge. We conducted intercept surveys at each of our eight corner stores with the goal of interviewing 80 patrons per store for a total of 640 patrons before and after the store conversions. Patrons were screened for eligibility, which included living within four blocks of the store, being over 18 years old, and having purchased food during the current visit to the corner store. They could not have only purchased alcohol, tobacco, or other non-food items; the rationale being to have them resemble community members who shopped for food. Unlike the community survey, we used a repeated cross sectional design, where data were collected at baseline and at 6–12 months later. These face-to-face interviews were conducted in Spanish and English and took approximately 12 minutes to complete. The AAPOR response rate at baseline was 65 and 57 % at time two (see Table 3). Participants were offered a \$5 voucher to be used at the study corner store, which was also an incentive for the store to allow us to conduct the study onsite, at \$400 store per study time point.

Table 3 Patron survey characteristics

Measure	n (%)
<i>Response rate</i>	
Baseline	641 (65) ^b
Follow-up ^a	241 (57) ^b
<i>Female respondent</i>	
Baseline	325 (51)
Follow-up ^a	134 (56)
<i>Interview in Spanish</i>	
Baseline	362 (56)
Follow-up ^a	141 (59)

^a Follow-up measurements based on three stores

^b Based on AAPOR response rate 4 = completes/(screened eligible + 0.5*individuals not screened who may have been eligible)

Questionnaire Modules

To develop the questionnaires, we conducted a comprehensive review of the peer-reviewed scientific and grey literature on neighborhood corner store and grocery store interventions. This literature review aided in identifying key variables and modules that were either maintained in their original form or adapted by the research team. We also constructed new measures when necessary. The community survey had 25 modules, and the patron survey had 7 modules (see Table 4). The English and Spanish versions of the instruments were pretested with 20 community respondents similar to our survey respondents to identify problem questions and concepts and to obtain survey length estimates. Following the pretesting process, minor modifications were made to some questions to improve clarity and parsimony.

Neighborhood-level Corner Store Assessments

We wanted to determine community-level corner store changes over a 2-year period independent but concurrent with our intervention activities. This information aided in establishing causality and assisted in determining if there were spillover effects from our intervention. Thus, trained staff cataloged and followed five corner stores closest to each of our eight study stores. We created an observation tool that assessed store size, facilities, cleanliness, inventory and inventory display (e.g., layout, shelving, lighting), and internal and external store marketing, including signage, banners, and posters. In particular, we focused on canned, frozen and fresh fruit and vegetable availability.

Store Owner Interviews

We also conducted key informant interviews of the store owners to determine their levels of satisfaction and perceived benefits or challenges associated with participation. Interviewees included both store owners and a family member of one of the owners. In total, four interviews were

Table 4 *Proyecto MercadoFRESCO* questionnaire modules

Module	Community survey	Patron survey
Household composition ^a	✓	
Neighborhood and social cohesion ^b	✓	
Home food preparation ^a	✓	
Healthy food environment ^c	✓	
Food consumption ^d	✓	✓
Food purchasing ^a	✓	✓
Usual food store ^a	✓	
Corner store purchasing patterns and attitudes ^a	✓	
General corner store attitudes ^a	✓	
Corner store 1 ^a	✓	✓
Study store purchasing patterns and attitudes ^a	✓	✓
Nutrition knowledge and information sources ^a	✓	✓
Nutrition label show card questions ^c	✓	
Food self-efficacy ^f	✓	
Food security ^g	✓	
Healthcare utilization, access and sources of care ^b	✓	
CVD knowledge, attitudes and beliefs ^h	✓	
Health conditions ^a	✓	
Depressive symptomatology ⁱ	✓	
Physical activity and exercise ^j	✓	
Height and weight ^b	✓	
Demographics ^b	✓	✓
Citizenship and immigration ^b	✓	
Poverty ^b	✓	
Program participation ^b	✓	
Social marketing ^a	✓	✓

^a Questions developed by *Proyecto MercadoFRESCO*

^b Questions primarily drawn from the 2009 California Health Interview Survey

^c Questions primarily drawn from the Fulkerson Home Food Survey

^d Questions primarily drawn from the Townsend Food Behavior Checklist

^e Questions primarily drawn from the Newest Vital Sign

^f Questions primarily drawn from the Network for a Healthy California LAUSD Parent Survey

^g Questions primarily drawn from the U.S. Household Food Security Survey Module: Six-Item Short Form

^h Questions primarily drawn from the 2001 California Health Interview Survey

ⁱ Utilizes the PHQ-9 Patient Depression Questionnaire

^j Questions primarily drawn from the International Physical Activity Questionnaire

completed. Three interviews took place in the store, and a telephone interview was conducted with one individual. Graduate students conducted the interviews using a semi-

structured interview protocol. Interviews were conducted in both English and Spanish depending on the respondent's preference. The interviews lasted roughly 30 minutes, and respondents were given a gift card for their participation.

Challenges in Implementation

We faced a few important challenges during the implementation of our intervention. Although we successfully recruited eight stores, we reached out to a number of stores that ultimately decided not to be involved. Some store owners appeared not to trust our motivation and seemed to fear that we would “take over” their businesses. Others were concerned about a potential loss of revenue during the time of conversion. As mentioned above, having a former corner store owner as a consultant and partner in our efforts mediated some of these concerns. However, it is important for anyone considering engaging in an effort like this to understand that there are challenges with store recruitment and retention. For example, while we converted four stores, one store owner, who was originally fully committed to the program and the philosophy of improving healthy food access, dropped out of the project early and became a liquor store. This situation is somewhat common, however, in community intervention work, where there are many community and business factors that can impact project implementation.

An additional challenge that emerged throughout the intervention was that the store owners needed more assistance and support than we initially anticipated. As part of our selection process, we identified stores with a strong customer base and an owner that had good business skills; therefore, following the initial training and store conversion ongoing support was offered on ad hoc bases. Nevertheless, we learned that it would be better to provide more systematic ongoing training and booster sessions in order to improve the likelihood that changes would be sustainable. This lesson suggests that a more “swat-like” approach, where organizations or public health practitioners go in and quickly “make-over” a store and then leave, is inadequate. In the short-term, community access to fresh and affordable fruits and vegetables may increase, but stores will likely have difficulty maintaining changes to procurement, discarding spoiled inventory, and have problems in other business issues like bookkeeping and negotiating with wholesalers.

Conclusion

Corner store conversions provide the opportunity to improve the food environment in food swamps and food deserts by increasing access to fresh fruits and vegetables and by raising awareness of the importance of healthy

eating among community residents. The public health field is just beginning to learn about best practices for implementing corner store conversions. Our study offers a somewhat unique approach to engaging the community, especially through our work with youth, in improving their local food environment. As in many community intervention projects, there are unanticipated benefits and challenges to designing and implementing corner store conversions. Therefore, we employed a community-engaged approach that allowed for ongoing feedback from our partners to make any necessary modifications to improve service delivery and to help sustain the project's efforts. Success will be dependent on a myriad of factors, including neighborhood demand for healthy foods, store owner buy-in and commitment to the project, effective social marketing campaigns to drive patronage to the stores, the ability of store owners to work with wholesalers, vendors, and other food suppliers so that food can be purchased at prices competitive with unhealthy snack foods, and the overall profitability to the stores.

We have identified three main facilitators for a successful store conversion. First, having strong community involvement throughout all phases of the intervention strengthens community trust and awareness and allows for tailoring the intervention specific to community needs and contexts. It is essential to have an understanding of community experiences, perceptions, needs, and demands in order to implement effectively the intervention and to increase patronage and purchasing of healthy foods. Second, a key part of identifying and working with stores is to partner with someone who is familiar with the business of corner stores, including merchandising, marketing, working with wholesalers, bookkeeping, and other general business practices specific to operating a corner store. Benefits to working with someone who is experienced with the corner store industry are that they generate trust with the store owners and help build store owner confidence in taking risks in their short- and long-term involvement in the project. Moreover, having an experienced corner store expert facilitates communication between researchers and business owners. Third, any corner store or food venue intervention needs to have social marketing and health education strategies, such as media campaigns, community events, and positive health messaging. A limitation of similar food environment interventions has been an absence of these components [16]. Simply converting stores without these components will be insufficient. Social marketing and health education will raise awareness about healthful eating and where to purchase healthy food, which, in turn, can increase and sustain demand for the healthy food made available at the converted stores.

In our framework, we chose to work closely with students from local high schools to carry out many of the

intervention activities including participating in the physical store conversions, social marketing efforts, and providing health education in the community. The youth were committed partners and brought a tremendous amount of enthusiasm to the work. Their involvement also generated much community interest and buy-in. Working with youth, however, is just one of many viable models for community engagement. Program developers might choose to work with different partners, such as faith-based organizations, Rotary Clubs or other community-based volunteer organizations. The important lesson is to develop a team of dedicated individuals who will generate community interest and involvement and who are committed to transforming the health of their communities.

Creating innovative and successful interventions to improve a community's food environment can be challenging, but such interventions are fundamental if researchers, practitioners, and policymakers want to stymie the obesity epidemic and improve health disparities. Converting corner stores into healthy community assets is one strategy that holds promise for transforming food deserts and swamps, if converted with all the necessary intervention components and partners. While there is still much to learn about best practices that can be translated across communities and contexts, our project provides some necessary lessons for successful implementation.

Acknowledgments This work was supported by Grants from the National Heart, Lung and Blood Institute (NHLBI) at the National Institutes of Health (NIH) P50 HL105188 and R25 HL108854.

References

- Langellier, B. A., Garza, J. R., Prelip, M. L., Glik, D., Brookmeyer, R., & Ortega, A. N. (2013). Corner store inventories, purchases, and strategies for intervention: A review of the literature. *Californian Journal of Health Promotion*, 11(3), 1–13.
- National Research Council. (2009). *The public health effects of food deserts: Workshop summary*. Washington, DC: The National Academies Press.
- Sturm, R., & Cohen, D. A. (2009). Zoning for health? The year-old ban on new fast-food restaurants in South LA. *Health Affairs*, 28(6), w1088–w1097.
- Rose D., Bodor, J. N., Swalm, C. M., Rice, J. C., Farley, T. A., & Hutchinson, P. L. (2009) Deserts in New Orleans? Illustrations of urban food access and implications for policy. Paper presented at Understanding the Economic Concepts and Characteristics of Food Access, Washington, DC.
- Larson, N., & Story, M. A. (2009). Review of environmental influences on food choices. *Annals of Behavioral Medicine*, 38, S56–S73.
- Chen S. E., Florax R., & Snyder S. D. (2009) Obesity, fast food, and grocery stores: Evidence from geo-referenced micro data. Paper presented at Understanding the Economic Concepts and Characteristics of Food Access, Washington, DC.
- Morland, K., Diez Roux, A. V., & Wing, S. (2006). Supermarkets, other food stores, and obesity: The atherosclerosis risk in communities study. *American Journal of Preventive Medicine*, 30(4), 333–339.
- Powell, L. M., Auld, M. C., Chaloupka, F. J., O'Malley, P. M., & Johnston, L. D. (2007). Associations between access to food stores and adolescent body mass index. *American Journal of Preventive Medicine*, 33(4), S301–S307.
- Gittelsohn, J., Franceschini, M. C., Rasooly, I. R., et al. (2008). Understanding the food environment in a low-income urban setting: Implications for food store interventions. *Journal of Hunger and Environmental Nutrition*, 2(2–3), 33–50.
- Song, H.-J., Gittelsohn, J., Kim, M., Suratkar, S., Sharma, S., & Anliker, J. (2009). A corner store intervention in a low-income urban community is associated with increased availability and sales of some healthy foods. *Public Health Nutrition*, 12(11), 2060–2067.
- Gittelsohn J., Rowan M., & Gadhoke P. (2012). Interventions in small food stores to change the food environment, improve diet, and reduce risk of chronic disease. *Preventing Chronic Disease*, 9, 110015. doi:10.5888/pcd9.110015.
- Cavanaugh, E., Green, S., Mallya, G., Tierney, A., Brensinger, C., & Glanz, K. (2014). Changes in food and beverage environments after an urban corner store intervention. *Preventive Medicine*, 65, 7–12.
- Laska, M. N., Borradaile, K. E., Tester, J., Foster, G. D., & Gittelsohn, J. (2010). Healthy food availability in small urban food stores: A comparison of four US cities. *Public Health Nutrition*, 13(7), 1031–1035.
- Baquero B., Linnan L., Laraia B. A., & Ayala G. X. (2014). Process evaluation of a food marketing and environmental change intervention in tiendas that serve Latino immigrants in North Carolina. *Health Promotion Practice*. doi:10.1177/1524839913520546.
- U.S. Census Bureau. (2010). <http://www.census.gov/2010census/news/press-kits/summary-file-1.html>. Accessed August 7, 2014.
- Cummins, S., Flint, E., & Matthews, S. A. (2014). New neighborhood grocery store increased awareness of food access but did not alter dietary habits or obesity. *Health Affairs*, 33(2), 283–291.
- Glik, D., Prelip, M., Myerson, A., & Eilers, K. (2008). Fetal alcohol syndrome prevention using community-based narrow-casting campaigns. *Health Promotion Practice*, 9(1), 93–103.