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### Understanding a Key Feature of Urban Food Stores to Develop Nutrition Intervention

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## Understanding a Key Feature of Urban Food Stores to Develop Nutrition Intervention

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*The food environment in low-income communities may be attributable to the increased prevalence of diet-related chronic diseases. The purpose of this study is to describe the key features of urban food stores. For our descriptive study, 13 corner store owners and 4 supermarket managers were interviewed. Most urban corner stores had closed-store layouts, limiting accessibility to foods. Foods stocked at the corner stores included canned foods, soda, and chips; low-fat, low-sodium, and fresh produce were rarely available. Limited shelf space and a lack of a variety of healthy foods in wholesale stores were mentioned as barriers for stocking healthy foods. Corner stores are a potential venue to improve the food environment, and tailored interventions at multilevel*

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*focusing on store owners, wholesalers, and customers are urgently needed.*

**KEYWORDS** *corner stores, urban food environment, African Americans*

## INTRODUCTION

Urban ethnic minority populations in the United States have relatively high levels of diet-related chronic diseases.<sup>1</sup> Increased prevalence of diet-related chronic diseases in urban communities may be partly attributable to the lack of availability and inaccessibility to healthy foods. Indeed, studies have shown that communities residents' dietary patterns are closely related to their food environment.<sup>2-4</sup> Poor urban communities tend to have more fast-food restaurants and small corner stores with limited selection of foods. This makes it challenging for community residents to obtain healthy foods. Conversely, affluent communities are likely to have easy access to a greater number of supermarkets that provide a wide variety of foods at relatively cheaper prices.<sup>4-9</sup>

To address this environmental disparity, researchers have used food stores as a potential venue for nutrition interventions at the community level, with common approaches such as providing nutrition information at the point of purchase, reducing food prices, and increasing the availability of healthy foods.<sup>10-18</sup> Despite such emerging intervention studies, the food environment in low-income inner cities as an intervention venue is rarely explored. Understanding the characteristics and operation of corner stores and various aspects of store owners' perceptions and decision making related to food stocking should be examined to develop sustainable community-based nutrition interventions. Further, small businesses in inner cities have been dominated by ethnic minority immigrants.<sup>19</sup> Despite language barriers and acculturation stress, other practical reasons such as low rents, small investment to initiate small businesses, and less competition attract ethnic minority immigrants to choose these small businesses.<sup>20</sup> Corner stores owned by ethnic minority immigrants in the United States have also been involved in a series of events in major inner cities that have exacerbated tensions and conflicts between ethnic minority merchants and community residents.<sup>19-21</sup> The underlying dynamics between ethnic minority merchants and community residents are another factor affecting food supply and demand in small store settings.<sup>22</sup>

The purposes of this article are to (1) describe the characteristics of corner stores in low-income urban areas, the stocking status of promoted foods, and the stocking decisions of store owners and (2) compare corner store

owners' psychosocial variables related to food stocking and food acquisition patterns to supermarket managers.

## METHODS

### Study Setting and Store Recruitment

Baltimore Healthy Stores (BHS) is a food store-based nutrition intervention program with a quasi-experimental design to improve the availability of healthy foods in Baltimore City. The pilot trial of the program was initiated to assess the feasibility of the nutritional intervention program for 10 months. In Baltimore City, a majority of corner stores are owned by Korean Americans; about 750 Korean American merchants are members of the Maryland Korean American Grocers Association (MD KAGRO). We collaborated with the MD KAGRO to recruit local Korean American corner stores in East and West Baltimore, 2 low-income areas of Baltimore City. Because this was a pilot trial to test the feasibility of healthy food stocking at urban corner stores, we invited a limited number of stores: 8 to 10 stores in each area. A total of 17 stores (13 corner stores and 4 supermarkets) were included in our study.

### Intervention Strategies and Promoted Foods

The BHS intervention program consisted of 5 themed phases; each phase lasted 2 months. For each phase, specific themes were emphasized and certain healthy foods and behaviors were promoted. Promoted foods included low-sugar cereal, high-fiber cereal, low-fat milk (1% or skim milk), cooking spray, baked/low-fat chips, low-salt crackers, whole wheat bread, diet soda, fresh fruits, 100% fruit juice, and water. The promoted foods were selected based on the findings of 24-hour dietary recall of community residents conducted during formative research to substitute foods that most contributed to the consumption of total energy, dietary fat, and sugar.<sup>23</sup> As intervention strategies, a variety of intervention materials including posters, shelf labels, and educational displays were used to promote specific healthy foods at point-of-purchase for African American community residents and additional intervention strategies were developed for Korean American store owners. Detailed information related to the intervention implementation and study findings is available in the literature.<sup>24,25</sup>

### Measurements

Participating store owners were asked a series of questions about store operations, store characteristics, food stocking decisions, relationships with

surrounding community, and psychosocial variables regarding healthy food stocking and sales. The main instruments used to collect data on food stores included (1) the Store Impact Questionnaire (SIQ) and (2) weekly food sales records. The quantitative instruments were piloted with 4 participating store owners for face validity and relevance.

#### STORE IMPACT QUESTIONNAIRE

The SIQ was developed based on similar instruments used in other food store-based interventions<sup>26</sup> and modified to reflect urban food environment and corner store settings in Baltimore City. The SIQ included both open-ended questions and several Likert-type scales. Store characteristics included store type and layout (“Checkout counter enclosed in Plexiglas, need to be buzzed in, can’t touch/see foods”), foods stocked, and ethnicity of employees. Psychosocial factors assessed store owners’ self-efficacy for stocking healthy foods, food-related knowledge, and outcome expectations for the sale of promoted foods and perceived program effects. The SIQ also assessed how often and where store owners obtained foods for stocking their stores.

#### WEEKLY FOOD STOCKING AND SALES RECORDS

Because sales records were not computerized at corner stores, we developed a form to capture the sales and stocking status of a range of healthy foods. Based on pilot tests, we determined that a weekly period was most appropriate to recall food sales and stocking status. To assess the sales and stocking of each promoted food, we asked store owners to recall whether they had the promoted food in stock in the last 7 days and to estimate the number of units sold in that period.

#### Scale Construction and Data Analysis

A series of scales was developed to measure store layout, psychosocial factors, and outcome expectations on food sales. Internal consistency of scales was assessed using the Cronbach’s alpha statistic.

*Store layout* summed scores for questions related to store characteristics to identify how closed the store’s layout was to customers such as “need to be buzzed in” and “customers can’t touch/ see food.” The interviewer checked one of the response categories, *always*, *sometimes*, or *never*. The highest score, 2, was given to Never. The scores of store layout ranged from 0 (*totally closed*) to 8 (*totally open*).

*Outcome expectations on food sales* summed scores for 23 healthier foods including the foods promoted by the nutrition intervention program.

Using a 5-point Likert scale, respondents were asked to specify their level of agreement to statements such as “Fresh fruit will sell well in my store.” The highest score, 5, was assigned to the response *strongly agree*. Scale scores ranged from 23 to 115 ( $\alpha = .89$ ).

*Outcome expectations of BHS promotion effect* summed scores for 5 items. Using a 5-point Likert scale, respondents were asked how much they agreed with statements such as “If I stock the healthy foods promoted by BHS, overall food sales will increase.” The highest score, 5, was assigned to the response *strongly agree*. Scale scores ranged from 5 to 25 ( $\alpha = .82$ ).

*Self-efficacy* was assessed using 23 statements about stocking healthy foods. Respondents were asked how much they agreed or disagreed with statements such as “I can stock fresh fruit in my store.” The highest score was assigned to the response *strongly agree*. Scale scores ranged from 23 to 115 ( $\alpha = .75$ ).

*Food knowledge* was assessed by adding scores for correct answers to 9 questions such as “Which food is lowest in fat?” Scores ranged from 0 to 9 ( $\alpha = .70$ ).

*Healthy food stocking scores* were created by adding one point for each type of promoted healthy foods stocked at baseline. The stocking score was used to assess the feasibility of stocking types of health foods at corner stores rather than evaluating the magnitude of healthy foods stocked or healthy food sales. Based on healthy foods promoted by the intervention program, the following were selected to calculate the score, which ranged from 0 to 10, with a mean of 4.7 ( $\alpha = .62$ ): low-sugar cereal, high-fiber cereal, low-fat milk (1% or skim milk), cooking spray, baked/low-fat chips, low-salt crackers, fresh fruits, whole wheat bread, diet soda, 100% fruit juice, and water.

Descriptive statistics were used to summarize the sample characteristics; specifically, means plus or minus standard deviations and frequencies were used to describe quantitative data such as the store layout, several aspects of operations of the participating corner stores, and store owners’ psychosocial variables. Spearman’s correlation tests were conducted to examine the association among store owners’ psychosocial variables, store layout, and healthy food scores.

The study was approved by the Johns Hopkins Bloomberg School of Public Health Committee on Human Research; informed consent was obtained from all respondents.

## RESULTS

### Store Characteristics

Table 1 shows the characteristics of participating stores by comparing stores according to store type. Compared to supermarkets, corner stores were

**TABLE 1** Characteristics of Participating Stores at Baseline

Variables	Supermarkets ( <i>n</i> = 4)	Corner stores ( <i>n</i> = 13)
Overall store layout (openness) score (range: 0–8)	7.5 ± 0.6	4.5 ± 2.1
Food products are not marked for price (%)	50.0	92.3
Checkout counter enclosed in Plexiglas (%)	0	77.0
Need to be buzzed into store (%)	0	38.5
Cannot touch/see food (%)	0	30.8
Store owners' perceived relationship with customers (%)		
Excellent	25	38.5
Good	75	53.9
Fair	0	7.7
Poor	0	0
Impact of hiring African American employees on food sales (%)		
May increase	33.3	15.4
No impact	66.7	76.9
May decrease	0	7.7
Impact of hiring African American employees on the relationship of the store with its customers (%)		
May increase	66.7	58.3
No impact	33.3	41.7
May decrease	0	0
Mean number of years operating/managing the store (years)	0.6 ± 0.5	9.5 ± 8.8
Mean number of years operating/managing any food stores (years)	9.8 ± 4.5	13.9 ± 8.6

far less likely to have an open-store layout. About 77% of participating corner stores had a checkout counter enclosed in Plexiglas that was already installed when they took over the stores or the Plexiglas was installed for security reasons. Thirty-nine percent kept customers from entering the stores and 31% did not allow customers to touch or see food prior to sale. Despite the closed-store layouts, the majority of corner store owners (92.4%) perceived that they had excellent or good relationships with their customers.

### Promoted Food Stocking Status

Most of the promoted foods, except baked/reduced-fat chips and low-salt crackers, were available at the participating supermarkets; a majority of foods stocked at the corner stores were canned foods, soda, and chips. Relatively healthier versions of foods, such as low-fat, low-sodium, and low-sugar foods and fresh produce were rarely available at corner stores. Healthy foods stocked at corner stores included diet beverages, 100% fruit juice, water, and the ones promoted by Special Supplemental Program for Women, Infants and Children (WIC) program because a majority of the participating

stores accept WIC vouchers. Although some healthier foods were available at corner stores, the variety and amount of healthy foods were very limited compared to the proportion of regular versions of foods. The store owners responded that they limited and regulated healthy food stocking on purpose due to a lack of customer demand, slow turnover of healthy foods, and limited store space. Most corner stores had 2 to 3 units of low-fat milk but there were more than 10 units of whole milk. Also, only one or two types of fresh fruit were available at corner stores. Foods such as whole wheat bread and baked or reduced-fat chips were rarely available. Even at the participating supermarkets, baked or reduced-fat chips were unavailable.

### Most/Least Profitable Foods in Corner Stores Based on Sales Volume

Corner store owners reported that the most profitable foods included carry-out foods, beverages, and chips; the most profitable foods in supermarkets were reported as meats, bread, and perishable items. In corner stores the least profitable food items were milk, bread, and canned vegetables; in supermarkets the least profitable food items were dry groceries, seafood, and canned products. Corner store owners agreed that they could not make a profit on milk and bread because those are staple foods.

### Determinants of Food Stocking in Corner Stores

Corner store owners often reported practical difficulties and systematic barriers to ordering and stocking the promoted healthy foods. Limited shelf space, lack of a variety of healthy foods (low-sugar, low-sodium, low-fat) in wholesale stores designed for business owners, troublesome ordering procedures for vendors, and the short shelf life of fresh produce were reported as barriers to stocking healthy foods. Despite these barriers, several critical determinants prompted the corner store owners to stock healthy foods. At corner stores, customer requests or how well an item sold were identified as the main determinants for making current stocking decisions; previous owners' recommendations were the major determinant of food stocking decisions when the store owners took over the business (Table 2). In terms of customers' requests, the store owners responded that they could stock any kind of foods if there was a customer demand. Promotional strategies and business tactics to increase the sales of certain food items were usual at supermarkets; similar strategies were infrequently used at corner stores. Among the participating stores, some store owners have promoted target foods by changing the setup of merchandise, having regular sales, or by lowering prices compared to neighboring corner stores. On the other hand, about one third of corner store owners reported that they had never used any strategies to promote the sale of certain foods.

**TABLE 2** Decision Making Related to Previous and Current Food Stocking at Corner Stores (%)

Variables	Corner stores ( <i>n</i> = 13)
Determinants of food stocking decision when starting the store (%)	
Previous owners' recommendation	84.6
Other (previous experience, owner's own decision)	38.5
Other merchant's recommendations	23.1
Store size or shelf space	0
Determinants of current food stocking decisions (%)	
Customer's request	92.3
How well an item has sold	92.3
High profit margin	46.2
Others (want to try new foods, devoted to the community, buy cheaper brand, no change of food stocking after opening the store)	30.8
Promotion price	23.1
Store or shelf space	7.7
Strategies for promoting the sale of certain foods (%)	
Setup of merchandise	46.2
Regular clearance sales	30.8
None	30.8
Lowering prices compared to competitive stores	15.4

### Store Owners' Psychosocial Factors and Store Layout Related to Stocking Healthy Foods

Table 3 compares the psychosocial variables between corner store owners and supermarket managers. Compared to supermarket managers, participating corner store owners tended to have much lower outcome expectation scores on promoted food sales or the healthy food intervention program effect on store sales. Also, self-efficacy for stocking healthy foods and food-related knowledge scores of corner store owners were lower.

When corner stores were compared, more open corner stores and store owners with higher self-efficacy for stocking healthy foods had significantly higher healthy food stocking scores. Higher outcome expectations for the nutrition intervention program's effect and promoted food sales and food-related knowledge were also positively associated with healthy food stocking scores.

### Hiring African American Employees From the Community

All participating corner store owners were first-generation Korean American immigrants; all 4 supermarket managers were African American. A majority of the corner store owners and supermarket managers responded that hiring African American employees was likely to improve the relationship of their stores with their customers but would not impact food sales. Corner store

**TABLE 3** Comparison of Psychosocial Factors Between Supermarket Managers and Corner Store Owners

Variables	African American supermarket managers ( <i>n</i> = 4)	Korean American corner store owners ( <i>n</i> = 13)
Overall outcome expectation score: How well promoted foods will sell (range: 23–115)	89.5 ± 9.1	69.5 ± 12.2
Low-fat milk will sell well in my store <sup>a</sup>	3.5 ± 1	2.1 ± 1.0
Fresh fruit will sell well in my store	4.3 ± 0.5	2.8 ± 1.2
Cooking spray will sell well in my store	4.3 ± 0.5	1.8 ± 0.9
Overall outcome expectation score: BHS promotion effect on store sales (range: 5–25)	18.5 ± 3.4	14.7 ± 4.8
If I use BHS shelf labels to indicate healthy foods, overall food sales will increase <sup>a</sup>	4.3 ± 1.0	3.0 ± 1.0
Self-efficacy scores for stocking promoted foods (range: 23–115)	95.5 ± 4.1	81.5 ± 15.1
I can stock low-fat, low-salt crackers in my store <sup>a</sup>	4.5 ± 0.6	3.5 ± 1.0
Food-related knowledge score (range: 0–9)	7 ± 1.6	5.4 ± 2.1

<sup>a</sup>The score for each statement ranged from 1 to 5.

owners operated their stores for a much longer period (about 10 years) compared to a majority of supermarket managers (less than 1 year).

Although all of the participating corner stores were operated mainly by married couples, more than half of the participating corner stores hired full- or part-time employees. Among the 13 corner stores, 8 had full-time or part-time employees in addition to family members. The ethnicities of employees were African American (5 stores), Korean American (2 stores), Indian American (1 store), or Hispanic American (1 store).

### Corner Stores' Food Acquisition Patterns

Corner stores varied in acquiring and ordering foods. Seventy-seven percent of corner store owners shopped for their stores every day. All participating corner stores used a variety of stores to stock their stores, including wholesale stores designed for business owners, wholesale stores designed for the public such as Costco or Sam's Club, vendors, or supermarkets. At wholesale stores designed for business owners, healthy foods reportedly were rarely available and healthier foods were available only in bulk, making it more difficult for the store owners to purchase these foods. Certain food items—bread, beverages, and chips—were routinely ordered from vendors. The corner store owners reported that vendors only carried regular versions of foods such as white bread or regular chips for low-income urban areas; healthier versions of these foods can be delivered only when specifically

requested by store owners. Once chips were delivered to stores, vendors set up the displays, prioritizing the placement based on sales. Store owners also reported frequent trips to supermarkets to take advantage of promotional items, purchase items requested by customers, or try new items in small quantities.

## DISCUSSION

This article presents findings regarding the food environment of corner stores to develop a community-based nutrition intervention targeting ethnic minority store owners and low-income African Americans to improve the availability of healthy foods. In Baltimore City the majority of corner stores we examined had at least a partially closed-store layout that contrasted with the store owners' perceived positive relationships with customers. Also, more than half of the store owners hired their employees from the community. Although healthier foods were rarely available at corner stores due to barriers such as limited shelf space and lack of healthier versions of foods in wholesale stores, the store owners reported that customer requests were the main determinant for current food stocking. Compared to supermarket managers, corner store owners operated their stores for a longer period, but they were more likely to have lower self-efficacy for stocking healthy foods and poorer food-related knowledge. Also, corner store owners were less likely to expect a positive intervention program effect on store sales and on the promoted food sales.

Studies have implied that closed-store layouts can contribute to tensions between Korean American merchants and African American customers.<sup>27,28</sup> According to Stewart,<sup>29</sup> Korean Americans and African Americans have different sets of standards concerning appropriate attitudes and behaviors in business settings. For example, African American customers complain that Korean merchants ignore African American customers and throw their change on the counter; Korean merchants consider loudness and coarse language as unacceptable behaviors. Intercultural misunderstandings and language barriers play an underlying role in business settings, and closed-store layouts exacerbate these conditions by blocking an initiation of relationship or interaction between store owners and customers. However, in this study, store owners' positive perceptions toward their customers suggests that to some degree and with some customers the drawbacks of closed-store layouts are overcome by personal interactions with regular customers regarding customer food requests. Unlike in the supermarket setting, regular customers often interacted with corner store owners, frequently made small talk, and visited corner stores several times a day.

In poor urban community settings, Korean merchants possess an economically powerful position as employers. A common complaint from

African American communities is that so much is related to economic issues, such as “Korean merchants do not hire African American employees, and they do not contribute their profits to the African American communities.”<sup>19,27</sup> In our study, about 40% of participating corner stores hired African American employees from the community. Because strong relationship-building with community partners should precede community-based interventions, hiring store personnel from the community would not only facilitate effective intervention implementation but would also improve interracial relationships, improving the sustainability of the nutrition intervention program.

Customer requests, the main determinant affecting food stocking decisions at urban corner stores, has been also found in store intervention studies targeting other ethnic minority populations.<sup>30–32</sup> This suggests that community members can directly exert a significant influence on food availability at corner stores. Studies have also noted discrepancies between corner store owners and customers who report that community residents complain about the lack of healthy foods and the plethora of unhealthy foods, whereas store owners insist that there is no customer demand for healthy foods in their communities.<sup>25–33</sup> Future store-based interventions should focus on reducing the perceptual gap between customers and store owners in understanding the absence of healthy foods at corner stores. As suggested by Hosler et al,<sup>14</sup> successful store-based interventions depend on building a reciprocal relationship of supply and demand for healthy foods. It is not yet clear whether increased availability of healthy foods alone brings increased consumption or vice versa. Thus, a unilateral intervention approach targeting only customers or corner stores would be less effective than a multilevel approach working with both.

Corner stores in Baltimore City rarely carry healthy foods such as low-sugar, high-fiber, or low-sodium products with the exception of WIC-approved foods with limited amounts or variety, whereas high-fat, high-sodium, and/or high-sugar snacks are dominant. Selecting appropriate target foods at corner stores based on seasonality, potential profit to the stores, and outcome expectation of the store owners on healthy foods and expanding the variety of promoted foods would be key aspects for successful implementation of corner store-based interventions. For example, targeting snacks at corner stores is an appropriate strategy because snacks such as sodas and chips are not only the best-selling, most profitable foods, but they also contribute to about 20% of energy consumption of community residents.<sup>23</sup> In addition to snacks, low-fat milk, or low-sugar, high-fiber cereals can also be selected as the promoted foods because most corner stores accept WIC vouchers.

According to the findings of the BHS intervention study,<sup>24</sup> corner store-based nutrition interventions in urban communities would be more acceptable by stores who accept WIC vouchers because it is likely to reduce

the store owners' psychosocial burden related to stocking new, healthy foods for promotion at first. The corner stores would be able to expand the number and variety of healthier foods gradually. In addition, these stores can serve as an exemplary model to encourage future participation of other stores in the community.

In our study, healthy food stocking scores at baseline were positively associated with the openness of store layout and store owners' self-efficacy and food-related knowledge. Although closed stores cannot be forced to modify the layouts, with the establishment of good relations with community members, some alternative steps may be taken, such as better signage regarding the availability of healthy foods and allowing more customers to be permitted into closed stores.

This study had some limitations. In this setting, randomizing urban corner stores and recruiting representative sample stores were not feasible. However, we attempted to include a variety of corner stores with different sizes and store layouts to represent a range of types of corner stores from very closed to very open stores. Understanding urban food environments and examining the characteristics of corner stores in a low-income urban area are closer to hypotheses generating than providing substantive information. The findings also underscore the importance of a more systematic approach for the development of multilevel nutrition interventions including customer-level and merchant-level education and a reevaluation of environmental factors.

As a determinant of poor diets, the food environment in poor urban areas should be understood first for prevention and treatment of some diet-related chronic diseases. Further, nutrition interventions to improve the food environment is crucial to stop the current obesity epidemic.<sup>34,35</sup> Our findings shed light on how urban corner stores operate, make decisions about food stocking, and perceive the community at large. This information is important for the development of effective environmental interventions to improve healthy food availability in inner cities and to reduce the risk of chronic disease in some of the most disadvantaged groups in the United States.

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