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# Partnering with carryouts: implementation of a food environment intervention targeting youth obesity

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## Abstract

**Youth obesity is a major public health problem in the United States, especially among urban-based, minority youth. The B'More Healthy Communities for Kids (BHCK) trial worked at multiple levels of the food environment, including carryouts, to increase access to and demand for healthy, affordable foods. The objective of this article is to describe the development and implementation of BHCK's carryout intervention. Process evaluation was conducted to assess intervention reach (number of interactions with youth and adults either in person or on social media), dose delivered (number of food samples and promotional materials distributed, social media posts and meetings with owners) and fidelity (availability of promoted items). Overall, the carryout intervention showed moderate to optimal reach, moderate to optimal dose delivered and moderate to optimal fidelity. These findings demonstrate a successfully implemented carryout intervention in a low-income urban setting. Lessons learned about new methods for engaging the community and increasing demand for healthy food can be used to inform future studies and programs to improve the food environment.**

## Introduction

Youth obesity is a major public health problem in the United States with 31.8% of youth ages 2–19 considered overweight or obese [1]. Recently, prevalence of youth obesity has risen among elementary school youth, ages 6–11 increasing their risk for hyperlipidemia, hypertension and abnormal glucose tolerance [1, 2]. Urban-based minority youth are more strongly affected by obesity [3]. Between 2011 and 2014 the prevalence of obesity among African American youth aged 2–19 was 19.5%, higher than the prevalence among non-Hispanic white or Asian youth [4].

Obesity risk factors are determined in part by the food environment [5]. The food environment can be defined as the availability, affordability, convenience and desirability of foods and refers to any location where food is acquired, such as grocery, convenience/specialty stores, carryouts, schools, after-school programs and farmers' markets [6, 7]. Supermarket migration to suburbs has led to decreased availability of healthy foods in low-income urban communities [3]. The low-income urban food environment thereby constitutes a major challenge to the public's health, leading to the designation of many of these areas as 'food deserts' [8]. Prepared food sources have become


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increasingly frequented in low-income food environments [9, 10]. Research indicates the mean body mass index (BMI) of people who eat more meals away from the house (i.e. from prepared food sources) is higher than those who eat more often at home [11, 12]. Previous studies in Baltimore City have defined a carryout as an independently owned, limited-service prepared food source with few seats or no seating area, where a patron orders and pays before eating [9]. A study investigating 92 carryouts in Baltimore City found healthy options were rare, with just 38.9% offering a choice of vegetable toppings, 11% whole wheat bread, 21.1% healthy sides and 56.5% automatically including fried side dishes [9]. Additionally, portions from carryouts are larger compared to food prepared at home and carryouts that do offer healthier options don't typically highlight or promote these items on menus [12]. There have been several interventions working to improve the food offered at prepared food sources, including carryouts, fast food restaurants and sit-down restaurants. A systematic review of community-based interventions in prepared food sources described 13 projects [13]. This review included articles published between September 2011 through January 2013 that focused on prepared food sources in public community settings, included an impact evaluation, described the intervention and evaluation findings and described interventions that started after 1990. Most interventions took place in urban settings throughout the United States ($n = 11$); three targeted low-income areas. All interventions sought to increase the sale of healthy menu items and used some type of signage to accomplish this goal. There were 10 interventions that used some form of menu labeling (e.g. a symbol to indicate healthy options) and 4 interventions that implemented a price reduction strategy. There were seven interventions that promoted their programs in the community, using techniques such as newspaper advertisements ($n = 5$), community event promotions ($n = 3$) and newsletters ($n = 3$).

This literature review provides valuable information about implementing prepared food source interventions in a variety of settings. However, there are still gaps that can be addressed with additional investigations, such as testing different methods for promoting intervention activities, increasing reach of the intervention and engaging the community. The aims of this article are to (i) determine the reach, dose delivered and fidelity of a carryout intervention, (ii) describe lessons learned from this trial and (iii) introduce a new method for promoting a carryout intervention program–social media.

## Materials and methods

### Study design

This work was implemented as part of the larger, multi-level, multi-component (MLMC) trial B'More Healthy Communities for Kids (BHCK). The BHCK trial used a group randomized study design, and classified 14 low-income, predominantly African American, geographic zones as either intervention or control. We used Baltimore City recreation centers as the center point for zones and a 1.5-mile surrounding radius as the zone perimeter. BHCK's target population was youth (10–14 years old) and their caregivers ($\geq$18 years) [14]. The overall target sample was composed of youth and caregiver dyads that were recruited from recreation centers and neighborhood sites in each zone. After dyads were recruited, the youth and caregiver were interviewed individually about their eating behaviors. The BHCK trial was divided into five levels: caregiver/social media level, youth leader/recreation center level, food source level (i.e. corner stores and carryouts), wholesaler level and policy level. This article focuses on the carryout component, targeting carryout customers to increase the demand for healthy foods and carryout owners to increase the supply of healthy foods. The study was reviewed and approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board (#4203).

### Carryout recruitment

BHCK used maps developed with the Johns Hopkins Center for a Livable Future Geographic Information System in addition to ground truthing techniques to recruit carryouts [15]. Carryouts were eligible for recruitment if they were within an

intervention or control zone and were frequented by youth (as determined by interviews with carryout owners). The implementation of the intervention occurred in three phases each lasting 8–10 weeks: (i) Menu Redesign (July 2014–September 2014), (ii) Smarter Sides and Beverages (September 2014–November 2014) and (iii) Smarter Combo Meals (November 2014–February 2015). The goals, intervention activities and evaluation measures can be found in Table I.

## Phase 1: menu redesign

In the first phase of this intervention, menu redesign, we determined which foods carryout owners sold and compared the nutritional value of these items to BHCK standards for healthy items. These standards were based on a previous carryout trial, Baltimore Healthy Carryouts (BHC) [9]. Healthy entrees had to be less than 600 kcal and 20 g of fat, side dishes had to be less than 200 kcal and 7 g of fat [9]. Carryout owners were interviewed about recipes for their menu items, which were analyzed for calorie and fat content using the USDA National Nutrient Database (db.nal.usda.gov). Registered dietitians reviewed these menu items to determine which items would meet BHCK standards. Menu redesign was largely based on previous work in the Baltimore Healthy Carryouts Trial [9]. Focus group discussions and interviews conducted during this trial helped to determine promotional methods that would be effective in this setting. New menu boards were created and items meeting standards were highlighted with a green leaf label and paired with the slogan 'select the fresh option' (both methods identified in focus group discussions) [9]. Owners provided feedback and approved all final menus before printing. We brought the completed menus to the carryout and posted them where the owners wanted, in clear view of the customers.

In addition, takeout menus were created to increase customer exposure to the intervention. Carryouts that already had takeout menus were given menu inserts. Inserts included a list of promoted items highlighted with green leaves and photos of the food options on a piece of article that could be inserted into the existing takeout menus. Owners were also given flash drives with the redesigned takeout menus for future printing.

To advertise carryout participation in the program, we posted BHCK posters on carryout doors and promoted them on social media. Social media accounts were open to the entire community; however, intervention participants (those who had participated in the interviews in intervention zones) were specifically invited to join through text messaging. Additionally, social media followers were recruited during interactive sessions at carryouts (described later). Newly designed menus were posted on Facebook and Instagram so that followers (caregivers and other community members) were informed about participating carryouts and the healthy options they offered.

## Phase 2: smarter sides and beverages

In the Smarter Sides and Beverages phase of the intervention, we aimed to increase the variety of healthy sides and beverages sold at carryouts. Based on previous research, BHCK staff created a list of healthy beverages (e.g. water, diet sodas) and sides (e.g. baked chips, vegetables and fruit) [9], for stocking and promotion in intervention carryouts [14]. Study staff distributed this list to carryout owners and encouraged them to stock at least two items (i.e. two healthier beverages and two healthier sides). Owners received $50 wholesaler gift cards to offset some financial risk of adding new items during this intervention phase.

To promote the healthy items among customers, 'interactive sessions' were conducted. An interactive session involved the study team purchasing samples from carryout owners and distributing samples, handouts containing health-themed activities (e.g. word search) and giveaways (e.g. water bottles) to youth and adult customers. Health education was also incorporated into the sessions. For example, during the promotion of healthy drinks, we brought a poster board with popular drinks (soda, energy drinks, juice, etc.) taped to it and the amount of sugar/bottle (real sugar spooned into a bag) stapled below. We were able to discuss the board and the health benefits of drinking low sugar beverages with participants. We conducted at least one interactive session per

**Table I.** *Description of BHCK carryout*

| Phase | Date | Goal | Activities | Evaluation |
|---|---|---|---|---|
| Menu redesign | July 2014 to September 2014 | To work with carryout owners to redesign menus to highlight existing healthy items and to promote intervention carryouts on social media. | Evaluate existing menus for nutritional content.<br>Attain nutrition information from carryout owners.<br>Redesign menus.<br>Post on social media about participating carryouts. | No. of healthy side options available.<br>No. of diet/low sugar beverage options available.<br>No. of carryout specific social media posts.<br>No. of likes/comments/shares per post.<br>No. of meetings with owners. |
| Smarter sides and beverages | September 2014 to November 2014 | Promote lower sugar drinks and lower fat/calorie side dishes. | Present low sugar drink options/low calorie side dishes that fit the BHCK 'healthy' criteria.<br>Give owners gift cards to help offset the risk of buying foods.<br>Post on social media about participating carryouts.<br>Hold interactive sessions at the request of the owner to promote healthy items. | No. of youth (ages 10–14) attending interactive sessions.<br>No. of adults (ages ≥18) attending interactive sessions<br>No. of giveaways/interactive session.<br>No. of handouts/interactive session.<br>No. of likes/comments/shares per social media post.<br>Proportion of carryouts with BHCK menus.<br>No. of carryout specific, social media posts.<br>No. of meetings with owners. |
| Smarter combo meals | November 2014 to February 2015 | Promote lower fat/calorie combo meals (entrée, side, and beverage) at a reduced price. | Develop healthy combination meals with owners.<br>Give owners gift cards to help offset risk of buying healthy foods.<br>Post on social media about participating carryouts. | No. of healthy side options available.<br>No. of diet/low sugar beverage options available<br>No. of healthy combo meals.<br>Proportion of carryouts with BHCK menus.<br>No. of carryout specific social media posts.<br>No. of meetings with owners.<br>No. of likes/comments/shares per social media post. |

carryout, with most taking place directly outside the carryout between 2 and 4 p.m. in order to capture the greatest number of youth heading home after school.

Social media advertised this phase among the caregiver audience. Interactive session times, locations and giveaways were announced on Facebook and Instagram to help increase the number of attendees.

## Phase 3: smarter combo meals

In the Smarter Combo Meals phase, we promoted healthier combination meals at each intervention carryout. Combination meals were comprised of a healthy drink, side and entree and sold at a reduced price (compared to buying all three items individually). Study staff met with owners to develop combination meals, determine prices and create corresponding posters to serve as combination meal 'menus'. Posters contained photos of the combination meal items with prices and a green leaf label. They were positioned next to carryout menus. Owners received a $50 wholesaler gift card to help offset potential financial loss associated with offering reduced prices.

Social media promoted this phase among the caregiver audience. A healthy combination meal poster was advertised on Instagram and Facebook.

### Process evaluation

Process evaluation was conducted in carryouts to assess intervention delivery. Standards, or goals for each intervention activity, were determined before the start of the intervention, based on previous carryout interventions and corroborated by the study staff [9]. For example, the number of available healthy sides in a carryout was a standard. Study staff determined that carryouts with <2 healthy sides met the low standard, those with 2–3 healthy sides met the moderate standard and those with ≥4 healthy sides met the high standard. A similar process was used to define all standards, which can be found in Table II.

The standards were classified into three categories: reach, dose delivered and fidelity [16]. Reach, the number of people who received the intervention, was determined by the number of people participating in the interactive sessions and the number of people who liked, shared or commented on Facebook or Instagram posts. Dose delivered, how well the target group was exposed to the intervention, was measured by the number of social media posts with carryout specific content, the number of visits with carryout owners and the number of handouts, samples and giveaways distributed during interactive sessions. Fidelity, how well the intervention was implemented, was measured by the placement of menu boards and the number of healthy sides, beverages and combo meals available.

We used three forms for recording process evaluation measures: visit forms, interventionist forms and environmental assessments [9]. Visit forms were used to track the rapport building process with the owners, the discussion of menu redesign and to ensure interventionist follow through with owner requests. Interventionists completed the visit form at least monthly, with additional visits by carryout owner request. The interventionist form measured the number of communication materials distributed during interactive sessions and the number of interactions with youth and adults. This form also had space for interventionists to collect qualitative feedback from customers about samples distributed during interactive sessions. Environmental assessments were used to evaluate food availability and menu board placement through direct observation of menu boards. Environmental assessments were recorded during monthly carryout visits. Social media posts, likes, shares and comments were tracked through direct observation of each platform. For all process evaluation assessments owners were unaware of what we were evaluating. Control zone carryouts were also tracked during the intervention period to serve as a comparison to intervention carryouts. The focus of this article will be on intervention carryouts alone.

### Process evaluation scoring

The success of the intervention was defined by how close each process evaluation measure was to reaching the high standard, which has been used elsewhere [17]. Optimal intervention delivery was defined as meeting or exceeding the high standard (i.e. the evaluation measure met ≥100% of the high standard). A moderate intervention delivery was classified as meeting 50% to <100% of the high standard, and an unacceptable intervention delivery was defined as meeting <50% of the high standard. At the end of each phase, study staff met to discuss process evaluation results and make adjustments to improve intervention delivery. A process evaluation score was determined for each phase, as well as, an overall score for each standard.

### Data analysis

Data were entered using Microsoft Access, 2010. Data were analyzed using Stata Version 13.1.

## Results

### Carryout owner demographics

During carryout recruitment, we approached 47 carryouts to determine the owner's interest in participating, 17 carryouts in control zones and 26 in intervention zones. We successfully enrolled six carryouts in intervention zones and eight carryouts in control zones. 57% ($n = 8$) of the owners were Korean speaking and 43% ($n = 6$) spoke English. Carryout owners declined participation for a number of reasons including: no interest in being

**Table II.** *BHCK carryout intervention process evaluation standards*

| Intervention standard | Measure | Low | Moderate | High |
|---|---|---|---|---|
| No. of carryout specific social media posts | Dose delivered | <2 | 2–3 | ≥4 |
| No. of meetings with owners | Dose delivered | <2 | 2–3 | ≥4 |
| No. of giveaways/interactive session | Dose delivered | <5 | 5–10 | ≥10 |
| No. of handouts/interactive session | Dose delivered | <5 | 5–10 | ≥10 |
| No. of samples/interactive session | Dose delivered | <5 | 5–10 | ≥10 |
| No. of youth (ages 10–14) attending interactive sessions | Reach | <5 | 5–10 | ≥10 |
| No. of adults (≥18) attending interactive sessions | Reach | <10 | 10–15 | ≥15 |
| No. of social media likes/comments/shares | Reach | 0 | 1–2 | ≥2 |
| Proportion of carryouts with BHCK menus | Fidelity | <0.2 | 0.2–0.7 | ≥0.8 |
| No. of healthy combo meals | Fidelity | <1 | 1–2 | ≥3 |
| No. of healthy side options available | Fidelity | <2 | 2–3 | ≥4 |
| No. of diet/low sugar beverage options available | Fidelity | <2 | 2–3 | ≥4 |

interviewed or the program ($n = 17$), too busy to participate ($n = 3$), the owner wasn't around ($n = 9$), or the store was going to close soon ($n = 3$).

### Carryout process evaluation results

The process evaluation results for each phase can be found in Table III. Social media recruitment resulted in 310 Facebook followers and 114 Instagram followers. Overall the intervention had optimal reach on social media (133% on Facebook and 112.5% on Instagram). The intervention had moderate reach among youth (75%) and optimal reach among adults (130%). Carryout dose delivered was moderate for social media posts (75.0% on Facebook and 66.6% on Instagram) and owner meetings (80.8%) and optimal for number of handouts (128%), giveaways (192%) and samples distributed (218.3%). Fidelity was moderate for the number of healthy sides (51.9%) and drinks (66.3%) available and optimal for the number of combination meals (110%) and proportion of carryouts with menu boards posted (100%).

We were also able to capture some qualitative information from customers who sampled taste test items. We held taste tests for sugar free drink mixes in all six carryouts. Some customers really liked the samples and mentioned that they had previously bought similar products (e.g. Crystal Light) for themselves. Other customers were less satisfied and thought it should be sweeter. We held taste tests for diet/low sugar sodas in three carryouts. Most people were surprised that they liked it. Others were unwilling to try the sample because they 'knew they didn't like it'.

We also passed out healthier snacks, such as baked chips and pretzels. People generally liked the baked chips and found them to be 'less greasy'. A lot of people had already tried pretzels, but took the samples knowing they liked them.

## Discussion

This article presents process evaluation results from the carryout component of the BHCK trial. This study is one of the first to incorporate a carryout component into a multi-level, multi-component intervention. It was the first study evaluating a carryout intervention targeting African American youth that incorporated social media to promote intervention activities. Overall, the intervention had moderate to optimal reach in person and optimal reach on social media. Social media reach varied between platforms and phases. Reach was higher on Facebook compared to Instagram. For Facebook, reach decreased slightly from the first to second phase and then increased again from the second to third phase, while for Instagram reach increased as the phases progressed. Posts during the second phase concerned locations and times of interactive sessions, while posts during the first and third phase

**Table III.** *BHCK carryout intervention process evaluation score results*

| Intervention standard | Measure | High standard | Phase 1 | Phase 2 | Phase 3 | Overall | Classification |
|---|---|---|---|---|---|---|---|
| No. of carryout specific social media posts (Facebook) | Dose delivered | ≥4 | 100 | 100 | 25 | 75.0 | Moderate |
| No. of carryout specific social media posts (Instagram) | Dose delivered | ≥4 | 100 | 75 | 25 | 66.6 | Moderate |
| No. of meetings with owners | Dose delivered | ≥4 | 130 | 67.5 | 45 | 80.8 | Moderate |
| No. of giveaways/interactive session | Dose delivered | ≥10 | N/A | 192 | N/A | 192 | Optimal |
| No. of handouts/interactive session | Dose delivered | ≥10 | N/A | 128 | N/A | 128 | Optimal |
| No. of samples/interactive session | Dose delivered | ≥10 | N/A | 218.3 | N/A | 218.3 | Optimal |
| No. of youth (ages 10–14) attending interactive sessions | Reach | >10 | N/A | 77.5 | N/A | 77.5 | Moderate |
| No. of adults (ages ≥18) attending interactive sessions | Reach | >15 | N/A | 130 | N/A | 130 | Optimal |
| No. of Facebook likes/comments/shares per post | Reach | ≥2 | 112.5 | 100 | 350 | 133 | Optimal |
| No. of Instagram likes/comments/shares per post | Reach | ≥2 | 75 | 83.3 | 400 | 112.5 | Optimal |
| Proportion of carryouts with BHCK menus | Reach | ≥0.8 | N/A | 100 | 100 | 100 | Optimal |
| No. of healthy combo meals | Fidelity | ≥3 | N/A | N/A | 110 | 110 | Optimal |
| No. of healthy side options available | Fidelity | ≥4 | N/A | 53.8 | 50.0 | 51.9 | Moderate |
| No. of diet/low sugar beverage options available | Fidelity | ≥4 | N/A | 65 | 67.5 | 66.3 | Moderate |

[a]Overall score was determined by taking the data from across all active phases and comparing it to the high standard.
[b]Not applicable (N/A) means the standard was not measured during that phase because the intervention activity had not occurred.

focused on carryout large menus and combination meal menus. These posts possibly prompted more engagement because they showed colorful pictures, rather than more text heavy posts promoting interactive sessions [18].

Carryout dose delivered was moderate for social media posts and owner meetings and optimal for the number of handouts, giveaways and samples distributed at interactive sessions. The number of social media posts was slightly higher for Facebook compared to Instagram. Posts were much more frequent at the beginning of the intervention, compared to the end across both platforms. This decline is likely due to the fact that more intervention activities could be posted about during the first and second phase (i.e. posts about menus and interactive sessions). During the third phase, we only posted a general advertisement of the combo meals phase. Due to the nature of a MLMC intervention, social media was used for other components in addition to carryouts. In order to not bombard social media threads with too many posts (which could lead to participants 'unfollowing' us), we limited our weekly posting. During the third phase, each level had several intervention activities that were executed and published on social media, leaving less room for carryout specific posts.

Fidelity was moderate for the number of healthy sides and drinks in intervention carryouts and optimal for the number of combination meals and proportion of carryouts with menu boards posted. Maintaining the high standard for healthy sides and drinks was the biggest challenge of this carryout intervention. While owners were mostly receptive to the intervention activities—menu redesign, interactive sessions and combination meal planning—it was difficult to get all owners to consistently stock healthy sides and drinks. We did offer them a small financial incentive each phase ($50); however, it is possible this amount wasn't sufficient for owners to

maintain the stocking of these items consistently throughout the phase.

The carryout component of the BHCK trial employed new methods of health promotion that increased the intervention dose delivered and reach. Previous studies have relied mainly on point-of-purchase promotions [9, 19]. Social media provided a method for reinforcing healthy promotions at the carryout. Research has indicated that menu labeling alone is not always effective for promoting healthier foods because customers are not aware of labels or what they mean [20]. In Phase 1, we posted on social media carryout menus with green leaves, the 'select the fresh option' slogan and photos of healthy items to show customers which items were healthy. Additionally, prior work has shown that involving caregivers in an obesity prevention intervention can help increase intervention impact on youth [21]. Previous interventions targeting other public health problems have employed social media and demonstrated an increase in participation and ability to remember program activities among the target group [22]. It is possible that reach among adults was so high in this intervention because of social media; high reach, measured by adult attendance at interactive sessions, could have been facilitated by social media post reminders. However, in order to determine the effect of social media on intervention activity reach, we would need to measure social media the dose received among people attending the interactive sessions. We cannot definitively determine social media dose received, i.e. how many people from the intervention saw the posts and if that directly increased interactive session attendance, because we did not measure if participants attended interactive sessions as a result of seeing something on social media.

Another new element introduced during this intervention was the employment of 'interactive sessions'. Previous interventions have incorporated taste tests; however, they have not used health education, handouts and giveaways as well [9]. These sessions served to increase the dose delivered of the intervention. Additionally, previous research has indicated that habit, price and taste are the most influential factors for customer ordering practices in Baltimore City carryouts [23]. Interactive session participants frequently commented that they wouldn't have tried an item (e.g. diet soda or baked chips) on their own; however, when they enjoyed the taste of the sampled item, they were happy to request that the carryout owner stock it in the future. Overall, the interactive sessions were beneficial for showing the taste appeal of eating healthy food to the customers and the monetary appeal of selling healthy food to the carryout owners. Owners were able to see how customers responded to the samples, in turn increasing their willingness to supply these healthier items. For example, several owners were surprised by the customers' positive reception to diet/low sugar soda in Phase 2. In Phase 3, we noted a slight increase in the stocking of these items, possibly due to the interactive session success.

Despite the general success of this intervention, there were a few limitations. Weather impacted the success of the interactive sessions. People were less likely to try the cold drinks, we offered at taste tests on colder days. The weather is an important consideration for these types of promotional activities. Another limitation is our method for calculating reach, which involved setting a standard for how many people we wanted to interact with, and then tracking how well that standard was met. Usually, reach is represented as the percent of the target population that received the intervention [16]. However, in community-based interventions, especially in large urban populations, it is usually impossible to track specific community members. We have successfully used our current method before to define reach in community-based interventions [17]. Another limitation of this intervention was that social media did not target youth, which could be particularly important for promoting healthy foods in this age group. About 73% of the adolescent population in the United States uses social media websites [24]. Additionally, research has shown that African Americans, females and lower income youths (ages 12–17) are more likely to use the Internet for seeking health information than any other source [25]. While using social media to target adult caregivers was an effective first step to increase intervention reach,

future social media interventions could target youth in addition to caregivers.

There were several lessons we learned from this trial. We learned that it is important to match the language of BHCK staff with the language of the carryout owner. Baltimore city carryouts are largely owned by Korean-speaking owners and having a study staff member who was able to effectively communicate was essential to both the implementation and evaluation [26]. We also learned that it is important to consider the carryout's existing infrastructure before implementing intervention components. In all, 66% of the intervention carryouts we worked with wanted new menu boards (previous menus were dirty, old and or non-existent). The remaining 33% of carryout owners were happy with their current menu boards and decided not to post our new menu boards. Their existing menus were colorful, printed professionally, with large, easy to read print; however, they did not include any designation of healthy items. These owners were still interested in promoting healthy items, and we were able to add green leaves in their takeout menus to highlight the healthy options available. These owners valued the takeout menus because this gave them something new for their carryout. In future trials, intervention method (i.e. highlighting healthy items with green leaf labels) should be catered to the carryout by using existing menu boards and adding promotional elements to them. Finally, although we were able to employ social media during every phase of this intervention to promote the carryout, we were unable to directly assess the dose received among the intervention group and were therefore unable to determine if social media improved reach at interactive sessions. In the future, it would be important to ask participants how they heard about the interactive sessions to determine if social media influenced participation.

## Conclusion

The BHCK carryout intervention provided new methods for changing the food environment such as employing social media to promote intervention carryouts and activities and conducting interactive sessions to increase intervention reach and dose delivered. Several lessons were learned, including: building rapport with carryout owners is critical for designing and implementing interventions, social media platforms such as Instagram and Facebook can be used to advertise intervention activities, and it is important to accommodate existing carryout infrastructure into intervention activities.

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## Conflict of interest statement

None declared.

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