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Food Expenditures and Food Purchasing Among Low-Income, Urban, African-American Youth

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Background: Low-income, urban African-American youth are at higher risk for obesity and less likely to meet dietary recommendations than white, higher-income youth. Patterns of food purchasing among youth likely contribute to these disparities, but little published information is available.

Purpose: To investigate food purchasing behaviors of low-income, urban African-American youth.

Methods: A total of 242 African-American youth, aged 10–14 years, were recruited from 14 recreation centers in low-income, predominantly African-American neighborhoods in Baltimore MD. Youth reported the amount of money typically spent on food, the source of this money, the place of purchase, and frequency of purchase for 29 foods and beverages. Data were collected in 2008–2009 and analyzed in 2009–2010.

Results: Youth reported spending an average of \$3.96 on foods and beverages in a typical day. Corner stores were the most frequently visited food source (youth made purchases at these stores an average of 2.0 times per week). Chips, candy, and soda were the most commonly purchased items, with youth purchasing these an average of 2.5, 1.8, and 1.4 times per week, respectively. Older age was associated with more money spent on food in a typical day ($p < 0.01$).

Conclusions: Food purchasing among low-income, urban African-American youth is frequent and substantial. Interventions aimed at preventing and treating obesity in this population should focus on increasing access to healthy foods in their neighborhoods, especially in corner stores.

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Introduction

The high prevalence of obesity in children and adolescents, along with poorer dietary behaviors, has been shown to disproportionately affect African Americans and those of low SES.^{1–6} Poor diet among low-income urban populations is often partially attributed to low availability of healthy foods.^{5,7–9} In Baltimore, low-income, predominantly African-American neigh-

borhoods have fewer supermarkets, more corner stores, and lower availability of healthy foods, such as fresh produce and low-sugar, low-fat snack foods, as compared to higher-income, predominantly white neighborhoods.^{10,11}

Little published information is available on food-purchasing behaviors among low-income urban African-American youth. One study¹² reports youth spending approximately \$1 per food shopping trip but does not report the total amount youth spend per day. Better understanding of food-purchasing behaviors is needed to guide interventions promoting healthier food choices among these youth.

Data presented here are part of baseline data for Baltimore Healthy Eating Zones (BHEZ), a nutrition intervention program aimed at substituting youth's purchasing and consumption of high-sugar, high-fat foods and beverages with low-sugar, low-fat alternatives. The present paper describes (1) youth food expenditures; (2) frequency of purchases; (3) types of foods purchased by

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African-American youth; and (4) associations between sociodemographic variables and youth food purchasing.

Methods

Setting and Sample

Participants were African-American youth aged 10–14 years recruited from 14 recreation centers in low-income Baltimore City neighborhoods. Children were eligible if they lived within 1 mile of the recreation center and/or attended the center at least once per week. Youth who returned signed parental consent forms were entered into a sampling frame and randomly selected for interviews. One child per household, along with the caregiver who did the majority of food shopping and preparation, was interviewed. Written youth assent was obtained at the time of interview.

Of the 432 children selected for participation, 176 did not return the consent form, and 14 child–caregiver dyads had incomplete interviews, resulting in a response rate of 56% (242 completed interviews). Of the 242 complete dyads, four were excluded for analysis because of missing variables of interest, leaving an effective analysis sample of 237 dyads for regression analyses. The Johns Hopkins Bloomberg School of Public Health IRB provided human subjects approval for the study. Each child and caregiver received a \$20 gift card for participation. Data were collected in July 2008–August 2009 and analyzed in 2009–2010.

Description of the Questionnaires

Data collectors administered a Youth Impact Questionnaire (YIQ), adapted from a questionnaire designed for African-American adults.¹³ The development and piloting of the YIQ is documented elsewhere.¹⁴

Youth were asked to recall the amount of money they spend on food for themselves on a typical day and the frequency of purchasing 29 different foods and beverages during the past 7 calendar days. They reported where they usually purchased each item from (supermarket, corner store, convenience store, fast food/carry-out, or school/recreation center) and how frequently they shopped at these food sources. Corner stores were small, privately owned food stores, whereas convenience stores were typically chain stores (e.g., gas stations or 7-Eleven).

Foods included 17 low-sugar and/or low-fat (healthy) foods and beverages to be promoted during the intervention and 12 high-sugar, high-fat (unhealthy) foods, commonly purchased foods determined by formative research. Healthy foods contained less than 10 g of sugar and/or less than 10% of the FDA Percent Daily Value for total fat per serving. These included water; 100% juice; diet soda; reduced-fat milk (2%, 1%, skim); subs/sandwiches; fresh/frozen fruit; canned fruit/fruit cups; baby carrots; celery; cucumber; other fresh/frozen vegetables; canned vegetables; baked chips; yogurt; juice popsicles; and dried fruit/nuts/seeds/trail mix. Unhealthy foods were regular (nondiet) soda; fruit punch/fruit drink; whole milk; burgers; french fries; Chinese food; pizza; chips/cheese curls; baked goods (e.g., cookies, cakes); candy; and ice cream.

The child also was asked the frequency of food preparation by household members during the previous 7 days. The child's height and weight were measured using the Invicta Portable Height Measure (Invicta Plastics, Leicester, United Kingdom) and Tanita Body Fat/Body Water Monitor (Tanita, Arlington Heights IL). Household demographic information (caregiver age, education level, employment

status, food assistance program participation, and household size) was collected via a Caregiver Impact Questionnaire.

Statistical Analysis

Descriptive statistics (Ms and SDs for continuous variables and percentages for categorical variables) were analyzed. Multivariable linear regressions were used to examine associations with the amount of money a child spent on food and the frequency of total food purchases. BMI, frequency of food preparation by another household member, and sociodemographic variables (child's age and gender, caregiver's employment status, education, age, household size, and participation in food assistance programs) were included as covariates.

Results

Table 1 shows participant and household characteristics. Table 2 shows youth expenditures on foods, frequencies of shopping at each store type, and frequencies of purchasing selected items. Youth spend an average of \$3.96 on a typical day (SD=\$3.54). Excluding 10 youth who reported spending no money, an average of \$4.13 was spent (SD=\$3.52).

Corner stores and fast-food/carry-out restaurants were most frequently visited, with 59% and 25% respectively purchasing from these venues at least twice in the previous 7 days. Only 13% of children purchased from supermarkets twice or more in the past week.

Youth purchased any of the aforementioned 29 foods and beverages an average of 13.0 times in the past 7 days (SD=12.3). Ten percent of children ($n=23$) did not purchase any of these items in the time period. The most frequently purchased foods were chips/cheese curls and candy. Regular soda and fruit punch were the most commonly purchased beverages.

Youth purchased any fast-food item an average of 1.9 times in the past week (SD=2.6). The mean weekly purchasing frequencies for any fruit or vegetable (excluding French fries) and for any of the 17 healthy items were 0.5 (SD=1.2) and 3.6 (SD=4.0), respectively. The most commonly purchased healthy items were dried fruit/nuts/seeds, and water.

The amount of money youth reported spending on food in a typical day showed a strong positive association with total number of food items purchased ($p<0.001$) and the child's age ($p<0.05$) (results not shown). A greater amount of money spent in a typical day ($p<0.001$) and a younger caregiver ($p<0.05$) were associated with a greater total frequency of food purchases (results not shown).

Discussion

Youth reported spending an average of \$3.96 on food for themselves on a typical day, more than reported by an observational study of corner store shopping among ur-

Table 1. Demographic characteristics of the study sample (N=242), % unless otherwise indicated

Youth characteristics	
Female	56.2
Age (years), M (SD)	11.6 (1.5)
Schooling: education (years), M (SD)	6.0 (1.5)
Self-identified ethnicity (African-American)	100.0
OVERWEIGHT AND OBESITY AMONG YOUTH BY BMI PERCENTILE	
Overweight (≥ 85 th and < 95 th percentile), both genders	17.1
Boys	12.3
Girls	20.9
Obese (≥ 95 th percentile), both genders	26.2
Boys	21.7
Girls	29.8
Individual adult caregiver characteristics	
Female	89.7
Age (years), M (SD)	39.5 (10.2)
Relationship to child (mother)	78.4
Self-identified ethnicity (African-American)	96.7
Never married (single)	53.3
Schooling: total years of education, M (SD)	12.4 (1.8)
Education >12 years	33.2
Employed (full-time and part-time)	58.7
Household characteristics	
Household size, M (SD)	4.6 (1.7)
Number of children aged <10 years, M (SD)	1.1 (1.2)
Number of adults aged >65 years, M (SD)	0.1 (0.4)
Material style of life score, M (SD) ^a	16.8 (5.8)
Participation in any food-assistance program	92.9
WIC	28.5
Food stamp benefits	58.2
Free or reduced-cost school breakfast or lunch	88.4

^aMaterial style of life score is the measure used as a proxy for SES. WIC, U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children

ban children, which found an average of \$1.07 spent per food shopping trip.¹² The greater expenditures found in the present study resulted in part from asking for the total amount spent throughout a typical day. Money spent at other venues, such as carry-outs, may also exceed that spent at corner stores. Children may not spend this amount every day but only on days they purchase food.

Chips, candy, and soda were purchased most frequently by youth, as has been observed in other studies.¹² These dietary patterns are dangerous because almost half the youth in this sample were overweight or obese, and greater consumption of sugar-sweetened beverages, potato chips, and food away from home is linked to obesity and poor diet quality in children.^{4,15,16} Corner stores were youth's most common food-purchasing venue, and the low availability of healthy foods in these stores likely contributes to youth's frequent purchasing of high-sugar, high-fat snacks.¹¹

Greater youth purchasing frequency was associated with a younger caregiver. It is plausible that parenting styles differ by caregiver age; less authoritative parenting styles have been associated with fewer family meals, which may increase youth's purchasing of foods outside the home.¹⁷

Older age significantly was associated with the amount of money youth spent on food. Older youth tend to prepare and purchase food for themselves more often.^{4,17}

Table 2. Youth food purchasing: monetary output, frequency, sources (N=242)

Amount of money spent per day on food (\$)	3.96 (3.54)
Excluding three extreme values (n=239)	3.71 (2.80)
Excluding those who reported spending no money (n=232)	4.12 (3.52)
Excluding those who reported spending no money and three extreme values (n=229)	3.88 (2.75)
Frequency of purchasing selected foods and beverages in the previous 7 days, M (SD)	
Chips or cheese curls	2.5 (3.3)
Candy	1.8 (2.7)
Soda (nondiet)	1.4 (2.4)
Dried fruit, nuts, or seeds	1.2 (1.8)
Fruit punch	1.0 (2.1)
Bottled water	0.8 (1.9)
Any healthy item	3.6 (4.0)
Any fast-food item	1.9 (2.6)
Any fruit or vegetable	0.5 (1.2)
Frequency of shopping by store type in the previous 7 days, M (SD)	
Corner store	2.0 (1.5)
Fast-food or carry-out restaurant	0.8 (1.0)
Supermarket	0.5 (0.8)
Convenience store (i.e., gas station or 7-Eleven)	0.4 (0.8)

Greater youth food expenditures also were associated with greater total purchases, indicating that children purchased additional unhealthy foods, rather than substituting healthy foods, which are often more expensive.¹⁸ Youth given a set amount of money tend to purchase higher-priced items less often, regardless of the items' healthfulness.¹⁹

Food purchasing among low-income youth may be improved through environmental interventions to increase access to healthy foods in corner stores, although such approaches present challenges because healthy items are often perishable and difficult for small stores to stock.^{20–22}

Limitations of this study include the low response rate and the possibility that youth were unable to accurately recall purchasing over 7 days. The group in this study may not be representative because of the low response rate. Also, no differentiation was made among seasons, between weekends and weekdays, in time of day purchasing occurred, or quantities consumed; moreover, no determination was made of whether other foods were purchased. Future research should address the timing and portions of youth food purchases.

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