Feeding a Family in a Recession: Food Insecurity Among Minnesota Parents

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Abstract

Objectives—We assessed current levels of food insecurity among a large, diverse sample of parents and examined associations between food insecurity and parental weight status, eating patterns, and the home food environment.

Methods—Project F-EAT (Families and Eating and Activity Among Teens) examined the home food environments of adolescents. Parents and caregivers (n=2095) living with adolescents from the Minneapolis–St. Paul, Minnesota school districts completed mailed surveys during a 12-month period in 2009–2010. We performed our assessments using multivariate regressions.

Results—Almost 39% of the parents and caregivers experienced household food insecurity, whereas 13% experienced very low food security. Food insecurity was significantly associated with poorer nutrition-related variables such as higher rates of parental overweight and obesity, less healthy foods served at meals, and higher rates of binge eating. Food-insecure parents were 2 to 4 times more likely to report barriers to accessing fruits and vegetables.

Conclusions—Food insecurity was highly prevalent. Environmental interventions are needed to protect vulnerable families against food insecurity and to improve access to affordable, healthy foods.

The United States is experiencing the most severe economic collapse since the Great Depression.[1,2] By historical standards, unemployment levels remain extremely high[3]; low-income families, who have been disproportionately burdened by the recession, are struggling to make ends meet.[4,5] This financial struggle often results in increased levels of food insecurity—the lack of consistent access to healthy, affordable food.[1] Current national estimates suggest 16% of US adults and 25% of US children are food insecure.[1,6]

Common household responses to having inadequate resources for food include food budget adjustments, reduced food intake, and alterations in types of food purchased. Nutrient-dense

foods (e.g., fruits, vegetables, whole grains, and lean meats) are significantly more expensive per calorie than are energy-dense foods (e.g., soft drinks, salty and sugary snacks, and pastries).[7,8] Thus, studies have shown that in households experiencing food insecurity, food variety tends to decrease and the consumption of energy-dense foods tends to increase.[9] A study in Minnesota found that food-insecure youths were more likely to eat fast food and less likely to consume breakfast and family meals than were food-secure youths.[10] Poor dietary intake resulting from household food insecurity has been associated with numerous health problems, such as higher rates of diabetes, stress and depression, and hospitalization.[11–15] Although the literature is inconsistent,[16] food-insecure households, particularly those headed by single mothers, have been found to have higher rates of overweight and obesity.[17–19] The concurrent prevalence of obesity and food insecurity is often referred to as the hunger–obesity paradox.[20,21]

Households with children are more likely to be food insecure than are households without children.[19,22] Studies have shown that parents, especially mothers, tend to restrict their own intake so enough food will be available for their children.[23,24] Additionally, communities of color and immigrant communities experience significantly higher rates of food insecurity compared with the national average.[25–27]

Given the shifts in the economic well-being of the United States, we assessed the current prevalence of food insecurity across sociodemographic characteristics among parents in a large, ethnically diverse population in Minnesota. To better describe implications of current food insecurity among parents, we also examined associations between food insecurity and parental weight status and eating patterns as well as measures of the home food environment.

METHODS

We drew our data from Project F-EAT (Families and Eating and Activity Among Teens), a population-based study of parents of adolescents aimed at learning more about food, physical activity, and home environments. A sample of 3709 parents or guardians of the adolescents enrolled in EAT (Eating and Activity in Teens) 2010 completed Project F-EAT surveys. EAT 2010 is a multilevel investigation of eating, physical activity, and weight-related topics among a diverse sample of 2793 adolescents from the Minneapolis–St. Paul, Minnesota school districts. Adolescents participating in EAT 2010 provided contact information for up to 2 parents or guardians; approximately 30% provided contact information for 1 parent or guardian, and 70% provided information for 2 parents or guardians. Project F-EAT mailed 4777 surveys to parents or guardians of adolescents, and 3709 (77.6%) parents responded. Parental response rates did not differ by adolescent gender, age, socioeconomic status, or language spoken at home, but rates did differ by race/ethnicity with the highest response rates among the parents of White adolescents. Parental response rates were 92.4% if the adolescent was White, 82.4% if African American, 85.8% if Hispanic, 85.8% if Asian American, 74.5% if Native American, and 82.8% if mixed or other. Overall, the response rate among parents was high: at least 1 parent responded for 85.3% (n=2382) of the adolescents, and for 67.9% (n=1327) of the adolescents who provided information on 2 parents, both parents responded. Because food insecurity has been previously shown to have a particularly adverse effect in households with children,[19,22] we included only parents who reported that they live with their adolescents. Thus, the analytic sample involved 2095 respondents.

Parents completed surveys by mail or telephone interview. To meet the needs of this culturally diverse group of parents, the survey was available in English, Spanish, Hmong, and Somali; additionally, we offered the telephone interview in East African and Hmong

dialects of Oromo, Amharic, and Karen. Each parent received a $25 gift card for her or his participation. A subsample of 102 parents completed the Project F-EAT survey twice in a 2-week period to examine test–retest reliability of survey questions. The Wilder Research Foundation in St. Paul, Minnesota (http://www.wilder.org) performed the data collection, which ran from October 2009 to October 2010.

Measures

Food insecurity—We assessed food security using the previously validated US Household Food Security Survey Module modified for self-administration,[28,29] which measures food security over the past 12 months. The survey module includes the following items: "Is this statement true?: 'The food that we bought just didn't last, and we didn't have money to get more'"; "Is this statement true?: 'We couldn't afford to eat balanced meals'"; "In the past 12 months, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?"; "In the past 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?"; and "In the past 12 months, were you ever hungry but didn't eat because there was not enough money for food?" If participants responded "often true," "sometimes true," or "yes" to more than 2 questions, then we categorized parents as food insecure; otherwise, we classified parents as food secure. As in previous studies, we considered families to have very low food security if they gave 5 or more affirmative responses to the screener.[29]

Sociodemographics—Self-report determined sociodemographic characteristics, including age, gender, race/ethnicity, marital status, educational attainment, and participation in public assistance. The following question measured race/ethnicity: "Do you think of yourself as White; Black or African American; Hispanic or Latino; Asian American; Native Hawaiian or Pacific Islander; American Indian or Native American; or other?" Because of limited numbers in some racial/ethnic groups, we recoded race/ethnicity into White, African American, Latino, Asian American, and other. One question assessed current marital status. Participants could select 1 option from the following: "married or in a committed relationship"; "divorced or separated"; or "single, widowed, or other." We recoded marital status as married or single. Two questions measured household educational attainment: "What is the highest grade or year of school that you have completed?" (test–retest $r = 0.84$) and "What is the highest grade or year of school that your spouse or partner has completed?" (test–retest $r = 0.75$). For analyses, household educational attainment included 4 categories: "did not finish high school," "finished high school," "finished college," and "advanced degree." Participants reported on employment status through the following question: "Which of the following best describes your current work situation?" (test–retest $r = 0.82$). Five options were available: "working full time," "working part time," "stay at home caregiver," "currently unemployed but actively seeking work," and "not working for pay." Participants reported on household income level through the following question: "What was the total income of your household before taxes in the past year?" (test–retest $r = 0.94$). Income included 6 categories ranging from less than $20,000 to $75,000 or more.

Weight status—Participants' self-reports of height and weight resulted in calculated body mass index (BMI; defined as weight in kilograms divided by the square of height in meters). For analyses, we assessed BMI as a continuous variable and dichotomized it according to BMI cutpoint guidelines for adults[30]: overweight (BMI ≥ 25) and obese (BMI ≥ 30).

Eating patterns—The following question measured breakfast consumption (as a continuous variable): "During the past week, how many days did you eat breakfast?" (test–retest $r = 0.82$). Participants selected 1 of 7 responses ranging from never to every day

(range: 0–7). Participants reported on fruit and vegetable consumption with 2 items: "Thinking back over the past week, how many servings of fruits (vegetables) did you usually eat on a typical day?" (range: 0–7; test–retest fruits $r = 0.69$; test–retest vegetables $r = 0.57$). To help participants better understand serving sizes, we provided participants cues such as, "A serving is a half cup of fruit or 100% fruit juice or a medium piece of fruit." We summed fruits and vegetables for analyses. One item measured sugar-sweetened beverage consumption: "Thinking back over the past week, how often did you drink sugar-sweetened beverages (regular soda pop or Kool-Aid)?" (test–retest $r = 0.66$). Response options ranged from less than once per week to more than twice per day (range: 0–6). The following question assessed fast food consumption: "In the past week, how often did you eat something from a fast food restaurant, such as McDonald's, Burger King, Domino's, or similar places?" (test–retest $r = 0.55$). Response options ranged from never to more than 7 times (range: 0–6). One question examined binge eating: "In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you (binge eating)?" (test–retest $r = 0.95$).[31]

Home food environment—Participants reported on family meal frequency with 1 item: "During the past week, how many times did all, or most, of your family living in your household eat a meal together?" (range: never to more than 7 times; test–retest $r = 0.72$). Six items measured the types of food served at family meals: "Think about a typical family dinner at your home. Is a green salad served? Are vegetables other than potatoes served? Is 100% fruit juice served? Is fruit (not including juice) served? Is milk served? Are sugar-sweetened beverages (soda pop, Kool-Aid, etc.) served?" (individual item test–retest r values ranged from 0.56 to 0.85).[32] Response options ranged from never to always on a 4-point Likert scale and we recoded these as sometimes or rarely and usually or always. Parents also reported on time spent preparing meals with an open-ended question: "How many hours per week do you normally spend preparing food for your family?" (test–retest $r=0.68$).[33] Four items adapted from Campbell et al. assessed perception of fruit and vegetable access, addressing cost, variety, and quality of produce, with response options ranging from strongly disagree to strongly agree (individual item test–retest r values ranged from 0.38 to 0.56).[34] We categorized response options to agree or disagree.

Statistical Analysis

We calculated descriptive statistics for demographic and other key variables. We assessed associations between food insecurity and key sociodemographic variables using the t test or the χ^2 test, as appropriate. We then examined crude (unadjusted) associations between food insecurity as the independent variable and parental weight status, parental eating patterns, and the home food environment as dependent variables. We estimated adjusted associations using multiple regressions, adjusting all regression models for age, gender, race/ethnicity, marital status, employment status, and highest household education. Using linear regression, we modeled continuous dependent variables (BMI, breakfast consumption, servings of fruits and vegetables, sugar-sweetened beverage consumption, fast food consumption, family meal frequency, fast food at family meal frequency, and time spent preparing meals). Logistic regression models allowed us to estimate the association between food insecurity and dichotomous dependent variables (overweight and obesity status, binge eating, variables related to the foods served at family meals, and variables related to perceived fruit and vegetable access). After estimating the regression models, we computed predicted probabilities for each observation in the data set at the observed value of the confounder variables. We have reported the average of these predicted values as the adjusted mean (which can be viewed as a generalization of standardization to the total study population). Finally, we calculated differences between the adjusted proportions with confidence

intervals (CIs) and *P* values, which we estimated using bootstrapping, a resampling method.[35] We ran all analyses using Stata version 10.0 (StataCorp LP, College Station, TX).

RESULTS

Food insecurity and very low food security were prevalent among Project F-EAT parents: 38.9% of respondents reported food insecurity, and 13.3% reported very low food security. Food-insecure parents were slightly younger than were food-secure parents (mean age=40.3 ±7.6 and 42.1 ±8.1 years, respectively; *P* < .01). Women, Asians and other non-White racial groups, and single parents had the highest rates of food insecurity (Table 1). There were significant inverse relationships between income and education and food insecurity status: those parents reporting lower income and educational attainment were more likely to report being food insecure.

Food-insecure and -secure parents differed in BMI and eating patterns. Unadjusted results (Table 2) and results adjusted for sociodemographic factors (Table 3) were similar; thus, we have discussed adjusted results. There were significant differences in overweight status between the food-secure and -insecure parents, with more food-insecure parents than food-secure parents being overweight. Food-insecure parents reported poorer eating behaviors than did food-secure parents for all behaviors examined. For example, food-insecure parents ate breakfast less frequently, consumed almost an additional full serving of sugar-sweetened beverages each day, and were more likely to report binge eating.

In general, the home food environment was poorer in food-insecure households than in food-secure households. Food-insecure parents more often reported having fast food at family meals and serving sugar-sweetened beverages at family meals, and food-insecure parents reported serving healthy items such as green salad, vegetables, and fruit less often than did food-secure parents. For example, 22.0% of food-secure parents reported serving sugar-sweetened beverages at family meals on a regular basis, as compared with 15.7% of food-secure parents, for an adjusted difference of 6.4% (95% CI=2.5, 10.3). Finally, there were large differences in perceived access to fruits and vegetables between food-secure and food-insecure parents. For example, 39.8% of food-insecure parents reported that fruits were too expensive to purchase compared with only 13.6% percent of food-secure parents, for an adjusted difference of 26.2% (95% CI=21.5, 30.6).

DISCUSSION

More than one third (39%) of the parents in the Project F-EAT sample were food insecure, including 13% who reported very low food security. Households in which the primary custodial parent was from an ethnic minority group or had lower levels of education were at the greatest risk for food insecurity. Food insecurity was associated with poorer nutrition-related outcomes, including increased rates of overweight and obesity, higher rates of binge eating, less reported access to fruits and vegetables, and poorer quality of foods served at family meals. These findings highlight the urgent need for addressing the high prevalence of food insecurity, particularly among parents of adolescents and among parents from ethnic minority groups with low levels of education.

In 2009, the statewide rate of food insecurity in Minnesota was 10.5%, whereas the US rate of food insecurity was 14.7%. (Note that these percentages using the 18-item US Department of Agriculture food security questionnaire.[1,6]) The parents and guardians sampled in Project F-EAT reported food insecurity levels that were almost 4 times state averages and more than 2.5 times the national average. Very low food security was twice that of state and national averages. Although Project F-EAT targeted a diverse, urban

population, we were dismayed to find that 2 in 5 parents in our sample were dealing with food scarcity. The current sample included a large portion of single mothers, a population shown to carry an inordinate burden of food insecurity worldwide.[23,24,36–38] Single mothers are more likely to have less education and to have lower incomes than are other parents, often resulting in higher rates of food insecurity,[39,40] which our results support. The effects of food insecurity, particularly on households headed by women, were related to most of the nutrition-related outcomes we assessed.

The results in our study uphold the previously observed paradox between food insecurity and overweight and obesity.[20,21,41] Food-insecure parents were significantly more likely to be overweight or obese. In addition, food-insecure parents were more likely to serve unhealthy foods, such as sugar-sweetened beverages and less likely to serve fruits and vegetables at family meals. Food-insecure parents consumed breakfast less often, consumed fewer servings of fruits and vegetables and more sugar-sweetened beverages and fast food. As mentioned previously, calories tend to be less expensive for unhealthy, calorie-laden foods[8]; thus, food-insecure households may be making less healthful decisions to make their food dollar stretch.[9] Our findings support the idea that food-insecure households struggle with healthy eating much more regularly than do food-secure households.

The higher weight status and poorer eating patterns of food-insecure parents may be partially related to the fact that food-insecure parents reported much more difficulty in accessing healthy foods such as fruits and vegetables than did food-secure parents. Food-insecure parents in our sample were 3 to 4 times more likely to find fruits and vegetables to be too expensive to purchase. In addition, food-insecure parents reported that the quality and variety of available fruits and vegetables were poor. Research has shown that low-income families often do their daily shopping at small corner stores or convenience stores in their neighborhoods.[41] Food at corner stores and convenience stores can be 150% to 400% higher in price than is food at a typical supermarket because these vendors often do not have the purchasing power or equipment to make nutrient-dense food more affordable or appealing.[42–46] Demonstration projects in-centivizing the purchase of fruits and vegetables by providing coupons among participants in the Supplemental Nutrition Assistance Program (SNAP) have been found to be successful.[47] Food-insecure parents in Project F-EAT would likely benefit from an expansion of fruit and vegetable incentive programs.

We found that food-insecure adults were at nearly twice the risk for binge eating than were food-secure adults. A recent Food and Nutrition Service report on redemption patterns of SNAP allotment showed that by 2 weeks after receiving their SNAP allotment, families already had less than one quarter of their monthly food allotment remaining.[48] Olson et al. have documented a cycle of deprivation and overeating among food-insecure parents: when a family is able to obtain food, overconsumption at the influx of food occurs; when there is not enough food, parents, especially mothers, tend to restrict their intake.[49] This cycle can promote the storage of fat and create an unhealthy relationship with food.[49] The high prevalence of both binge eating and obesity among food-insecure respondents in our study provides partial support for this theory and indicates a need for further exploration of pathways of association.

Strengths and Limitations

Study strengths and limitations should be taken into account in interpreting the findings. Our use of a large and diverse sample from a large metropolitan area is a study strength. Minneapolis–St. Paul has large communities of Hmong and Somali, who were included in the sample, providing an opportunity to learn about these population groups. However, because we included only parents in the Minneapolis–St. Paul area, the generalizability of study findings beyond this area may be limited. The wide breadth of the parental variables

assessed in our study is another important strength; for example, we are unaware of other large population-based studies that have examined the association between binge eating and food insecurity. We used a strong, commonly used screening tool to assess food security, although the precision of this measurement might fall short of what we would have obtained using the full questionnaire.[50] In interpreting the findings, it is important to note that measures used to assess parent weight status and eating patterns were brief and derived from self-reports. Finally, as a cross-sectional study, we could only examine associations and cannot draw inferences about temporality or causality of relationships between variables.

Conclusions

There is an ongoing need to eliminate food insecurity among households in the United States. The data indicated that amid the current economic conditions, food-insecure parents are at greater risk for obesity and poorer nutritional outcomes than are food-secure parents. Future studies should investigate mediating factors, such as the role that stress, financial and otherwise, plays in household food insecurity and its effects. Additional research is needed to examine the effects that high rates of household food insecurity have on the health and well-being of children and adolescents.

Despite the need for more research, our findings indicate that we need to mobilize now to help vulnerable families. Public assistance programs exist to decrease the burden of food insecurity; however, more work is needed to improve access to healthy foods. Many families may benefit from an expansion of fruit and vegetable incentive programs and improved access to healthy foods in their neighborhood. In addition, programs may want to target single mothers to improve their education level and income to decrease their risk for food insecurity and other poverty-related problems.

Acknowledgments

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TABLE 1

Food Security Status by Sociodemographic Characteristics of Project F-EAT Parents (n = 2095): Minneapolis–St. Paul, Minnesota, 2009–2010

Characteristics	Food-Secure Parents (n = 1279), % (No.)	Food-Insecure Parents (n = 816), % (No.)	P
Gender			.025
Female	60.4 (1169)	39.6 (768)	
Male	69.4 (109)	30.6 (48)	
Race/ethnicity			< .001
White	70.9 (436)	29.1 (179)	
Black or African American	61.8 (360)	38.2 (223)	
Hispanic or Latino	63.3 (224)	36.7 (130)	
Asian American	47.4 (185)	52.6 (205)	
Native American	50.0 (28)	50.0 (28)	
Mixed or other	42.6 (26)	57.4 (35)	
Marital status			< .001
Married	66.3 (844)	33.7 (430)	
Single	53.2 (430)	46.8 (378)	
Education			< .001
Did not finish high school	52.5 (324)	47.5 (293)	
Finished high school	62.1 (273)	37.9 (167)	
Some college	56.3 (316)	43.7 (245)	
Finished college	74.3 (248)	25.7 (86)	
Advanced degree	89.3 (109)	10.7 (13)	
Highest household education			< .001
Did not finish high school	51.0 (235)	49.0 (226)	
Finished high school	58.1 (266)	41.9 (192)	
Some college	54.9 (328)	45.1 (269)	
Finished college	72.4 (267)	27.6 (102)	
Advanced degree	90.3 (177)	9.7 (19)	
Employment status			< .001
Working full time	69.0 (668)	31.0 (300)	
Working part time	64.9 (226)	35.1 (122)	
Stay at home caregiver	50.2 (142)	49.8 (141)	
Currently unemployed but actively seeking work	45.1 (96)	54.9 (117)	
Not working for pay	52.8 (131)	47.2 (117)	
Household income, $			< .001
< 20 000	44.6 (335)	55.4 (417)	
20 000–34 999	56.1 (257)	43.9 (201)	
35 000–49 999	65.3 (203)	34.7 (108)	
50 000–74 999	80.4 (189)	19.6 (46)	
75 000	93.8 (242)	6.2 (16)	

TABLE 2

Unadjusted Differences in Parental Characteristics by Food Security Status Among Project F-EAT Parents (n = 2095): Minneapolis–St. Paul, Minnesota, 2009–2010

Characteristics	Food-Secure Parents (n = 1279), Mean ±SD or % (No.)	Food-Insecure Parents (n = 816), Mean ±SD or % (No.)	P
Body mass index	28.0 ±6.0	29.3 ±6.6	< .001
Overweight or obese status	64.7 (782)	72.5 (551)	< .001
Obese status	29.4 (355)	38.4 (292)	< .001
Eating patterns			
Breakfast consumption, times/wk	4.7 ±2.5	4.0 ±2.6	< .001
Servings of fruits and vegetables, servings/d	3.8 ±2.0	3.5 ±2.0	< .001
Sugar-sweetened beverages, drinks/d	2.9 ±4.1	4.0 ±4.6	< .001
Fast food consumption, times/wk	1.2 ±1.2	1.3 ±1.3	.013
Binge eating	6.4 (81)	11.3 (91)	< .001
Home food environmental factors			
Family meal frequency, times/wk	4.7 ±1.4	4.7 ±1.4	.93
Fast food at family meals, times/wk	0.8 ±0.9	1.0 ±0.9	.004
Foods served at family meals			
Green salad	30.4 (372)	24.7 (191)	.006
Vegetables	72.0 (878)	63.7 (489)	< .001
Fruit	34.7 (421)	29.9 (229)	.026
100% juice	28.9 (352)	30.1 (231)	.57
Milk	55.6 (673)	50.0 (376)	.004
Sugar-sweetened beverages	18.5 (226)	26.7 (206)	< .001
Time spent preparing meals (hrs/wk)	9.2 ±6.9	10.7 ±8.2	< .001
Perceived fruit/vegetable access			
Fruits too expensive	13.8 (175)	40.6 (326)	< .001
Vegetables too expensive	6.4 (81)	25.0 (201)	< .001
Limited variety	13.5 (171)	25.7 (207)	< .001
Poor quality	7.3 (93)	19.4 (156)	< .001

TABLE 3

Differences in Adjusted by Food Security Status Among Project F-EAT Parents (n = 2095): Minneapolis–St. Paul, Minnesota, 2009–2010

Characteristics	Food-Secure Parents (n = 1279)	Food-Insecure Parents (n = 816)	Adjusted Difference
Adjusted body mass index, mean (95% CI)	28.2 (27.8, 28.6)	29.1 (28.7, 29.6)	0.9 ** (0.3, 1.5)
Overweight or obese status, % (95% CI)	66.3 (63.3, 69.1)	73.0 (69.4, 76.4)	6.7 ** (1.9, 11.1)
Obese status, % (95% CI)	29.2 (26.5, 32.1)	36.9 (33.2, 40.8)	7.7 ** (2.6, 12.2)
Adjusted eating patterns, mean (95% CI)			
Breakfast consumption, times/wk	4.6 (4.4, 4.7)	4.2 (4.0, 4.4)	−0.4 ** (−0.5, −0.1)
Servings of fruits and vegetables, servings/d	3.8 (3.7, 3.9)	3.5 (3.3, 3.6)	−0.3 ** (−0.5, −0.1)
Sugar-sweetened beverages, drinks/d	3.0 (2.7, 3.2)	3.8 (3.5, 4.1)	0.8 ** (0.4, 1.2)
Fast food consumption, times/wk	1.2 (1.1, 1.3)	1.3 (1.2, 1.4)	0.1 * (0.1, 0.3)
Binge eating	6.3 (5.0, 7.8)	11.1 (8.9, 13.7)	4.8 ** (2.1, 7.7)
Adjusted home food environment factors, mean			
Family meal frequency, times/wk (95% CI)	4.6 (4.6, 4.7)	4.7 (4.6, 4.8)	0.1 (−0.1, 0.2)
Fast food at family meals, times/wk (95% CI)	0.9 (0.8, 0.9)	1.0 (0.9, 1.0)	0.1 ** (0.1, 0.2)
Foods served at family meals, % (95% CI)			
Green salad	29.6 (27.0, 32.5)	24.6 (21.4, 28.0)	−5.0 * (−9.3, −0.1)
Vegetables	72.3 (69.4, 75.0)	66.4 (62.5, 70.0)	−5.9 * (−10.0, −0.1)
Fruit	34.8 (32.0, 37.8)	28.9 (25.5, 32.5)	−5.9 * (−10.4, −1.3)
100% juice	28.1 (25.5, 30.9)	28.8 (25.5, 32.4)	0.7 (−3.6, 5.0)
Milk	55.1 (51.9, 58.3)	52.7 (48.7, 56.8)	−2.4 (−6.6, 2.4)
Sugar-sweetened beverages	15.7 (13.5, 18.2)	22.0 (18.8, 25.6)	6.4 ** (2.5, 10.3)
Time spent preparing meals, hrs/wk, mean (95% CI)	9.6 (9.2, 10.0)	10.2 (9.7, 10.7)	0.6 (−0.1, 1.3)
Perceived fruits and vegetables access, % (95% CI)			
Fruits too expensive	13.6 (11.8, 15.8)	39.8 (36.1, 43.6)	26.2 ** (21.5, 30.6)
Vegetables too expensive	5.9 (4.6, 7.4)	24.0 (20.7, 27.5)	18.1 ** (14.9, 22.2)
Limited quality	12.6 (10.8, 14.7)	22.0 (19.0, 25.4)	9.4 ** (5.9, 13.2)
Poor quality	7.3 (5.9, 8.9)	16.8 (14.1, 19.9)	9.5 ** (6.7, 13.1)

Note. CI = confidence interval. Differences adjusted for age, gender, race/ethnicity, marital status, employment status, and highest household education.

*
P < .05;

**
P < .01.