

Household Food Security and Fruit and Vegetable Intake among Low-income Fourth-Graders

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ABSTRACT

Objective: To examine the relationship between household food security and children's and parents' fruit, vegetable, and breakfast consumption and fruit and vegetable availability.

Design: Cross-sectional study using matched parent-child surveys.

Setting: Title I elementary schools in Maryland.

Participants: Ninety-two low-income parent-child dyads recruited from fourth-grade nutrition education programs completing a baseline evaluation.

Main Outcome Measures: Fruit and vegetable intake, breakfast consumption, and fruit and vegetable availability in home and school.

Analysis: Chi-square tests, 1-way ANOVA.

Results: Thirty-six percent of parents reported low/very low household food security, and both parents and students reported low fruit and vegetable intake. Students from households with low food security who were not participating in school nutrition programs had the lowest vegetable consumption and the fewest number of days consuming breakfast, indicating a relatively greater need for enrollment than their peers.

Conclusions and Implications: Few differences between children in food-secure and food-insecure households were observed, which underscores the need for research on food insecurity and children's eating behaviors. Examination of other factors influencing fruit and vegetable intake and improvements in food environments and programs are needed. Efforts to increase enrollment among eligible students in school nutrition programs may reduce negative consequences of household food insecurity.

Key Words: food preferences, hunger, parents, fruit, vegetable, poverty (*J Nutr Educ Behav.* 2011;43:455-463.)

INTRODUCTION

Food security status describes the extent to which families have access to the quantity of food needed to live a healthful, active lifestyle.¹ Over 11% of households in the United States experienced food insecurity in 2007, one third of whom were children under the age of 18.¹ In about 40% of food-insecure households, 1 or more family members has experienced disruptions in normal eating patterns and reduced food intake because of limited resources. Overall, 8.2 million adults and 3.7 million

children lived in households with very low food security.¹ Food-insecure households that avoid hunger do so by supplementing food shortages with emergency food assistance; federal food assistance programs, such as the Supplemental Nutrition Program for Women, Infants, and Children, the Supplemental Nutrition Assistance Program (SNAP), and the School Lunch and Breakfast Programs; and/or by limiting the purchase of more costly food. These forms of food assistance are an important resource to low-income families, although their effectiveness

in reducing food insecurity is difficult to measure.

Food Purchasing Behaviors, Food in the Home, and Food Security

Food acquisition and availability, constrained by limited resources, influence food consumption among low-income families. Two thirds of household food expenditures among low-income families, defined by the Bureau of Labor Statistics as those in the bottom 20% of the income distribution, was spent on food at home.² Among expenditures on food at home, 13.4% was spent on cereals and breads; 23.4% on meat, poultry, fish, and eggs; 10.9% on dairy products; 17.3% on fruits and vegetables (5.8% on fresh fruit, 5.4% on fresh vegetables, 3.2% on processed fruit, and 2.8% on processed vegetables); and 35.0% on other food at home. Low-income households are, unsurprisingly, more likely to purchase

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affordable, energy-dense, nutrient-poor food that contains refined carbohydrates, added fats, and added sugars.³

With regard to shopping behaviors, 1 study suggests that low-income parents were less likely to use nutrition labels when shopping and be aware of diet-related health conditions, and more likely to have diets high in fat and cholesterol.⁴ Low-income parents were also more attentive to food costs, convenience, and shelf life than higher-income parents,⁴ which may partially explain the purchase of larger quantities of processed food and smaller quantities of fresh fruits and vegetables. Food insecurity may exacerbate some of the worrisome shopping and food consumption patterns observed in low-income households. One study of Latino households showed that household food insecurity was associated with lower quantities and less variety of fruits and vegetables in the home.⁵

Although the overwhelming majority of mothers in low-income households regularly prepared food from scratch, food prepared from scratch by mothers in food-insecure households was less complex than the food prepared in households not experiencing hunger.⁶ Lack of complexity in food preparation was also related to lower energy and nutrient intake, and lower consumption of fruit, vegetables, grains, and proteins.⁶

Fruit and Vegetable Consumption and Food Security

Several studies have shown key deficiencies in dietary quality among low-income or food-insecure households,^{3,7-9} especially in regard to fruit consumption. Food insecurity is related to less frequent consumption of fruit,¹⁰ greater consumption of energy-dense food among children,⁹ and decreased consumption of fruits and vegetables among adults as household resources deplete.¹¹

Even though children are likely to be protected from hunger even in food-insecure households, 3.7 million children live in households experiencing very low food security.¹ Children raised under food-insecure conditions

may experience academic problems, lower body mass index than food-secure peers, and periodic food restrictions and lowered energy intake before parents' paydays.^{12,13} Examining whether food intake, food availability, and other behavioral factors are related to household food insecurity may provide an important basis for school-based and parent nutrition education programs.

Although research remains somewhat inconclusive about the extent to which food insecurity affects children's intake and dietary quality, nutrition assistance programs like the Supplemental Nutrition Program for Women, Infants, and Children, the National School Lunch and Breakfast programs, and SNAP affect children's access to fruits and vegetables and their food choices. Recent changes in school nutrition policies have resulted in fewer high-fat vegetables being served in cafeterias.¹⁴ Other important correlates of fruit and vegetable consumption among children include availability of fruits and vegetables in the home and preferences for fruits and vegetables.¹⁵ Nutrition assistance programs may have the potential to improve outcomes for food-insecure households, increasing fruit and vegetable consumption among parents and children, who may be at greater risk for overall low dietary quality. This article examines the extent to which household food security is related to children's and parents' fruit and vegetable consumption, breakfast consumption, and amount of fruits and vegetables in the home. Determining correlates of household food security in parents and children may help identify possible points of intervention and education for at-risk populations.

METHODS

Participants and Recruitment

Fourth-grade students from 2 Title I public schools in the Baltimore-Washington Metropolitan Region were recruited in 2007 as part of the Maryland Food Supplement Nutrition Education (FSNE) program evaluation (Table 1). These schools were chosen because they had a strong previous collaborative relationship with the

Maryland FSNE program; met the FSNE eligibility criteria for funding, with at least 50% of families earning less than 185% of the federal poverty level; and were about to commence a comprehensive nutrition education program integrated into the standard school curriculum. Baseline data from the larger, multiwave program evaluation were used for these analyses.

In September 2007, an information packet was sent home with every fourth-grade student at each of the 2 schools. This packet included a letter describing the study; parent consent and student assent forms; a parent questionnaire; and a magnet and pen. For purposes of this study, the term "parent" will be used to describe the parent or the adult caretaker of the student living in the home who completed the questionnaire. The caretaker indicated if the person was the mother, father, or another adult female or male living in the home. The letter describing the study and the consent and assent forms emphasized confidentiality and reinforced that study participation and responses were unrelated to students' access to classroom programs, grades, and so on, in an attempt to minimize perceived pressure for respondents to provide socially desirable responses.

Information packets were returned in unmarked envelopes to protect the confidentiality of parents' responses. Upon return of the parent's packet to the classroom teacher, all personal identifiers were removed. Student questionnaires were completed during 1 class period in November 2007 with a trained facilitator, who read each question aloud and instructed the students to mark their answers on the questionnaire. Assessments were completed before lunchtime so that all lunch food recall related to the previous day. Questionnaires were not completed on Mondays or the day after a school holiday so that questions about the previous day's intake reflected a school day. Parent and student surveys were not completed on the same day.

At the time of the study, 136 students were enrolled in the 2 fourth-grade groups. Only 93 of these students were eligible to participate in the study. Students were ineligible if they had withdrawn from school or

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