

# Ethnicity, Household Food Security, and Nutrition and Activity Patterns in Families With Preschool Children

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## ABSTRACT

**Objective:** This study evaluated the relationship between food security and child nutritional intake, sedentary behavior, and body mass index (BMI) and potential moderation by ethnic subgroup membership.

**Design:** Cross-sectional data analysis from baseline data of a preschool intervention trial.

**Setting:** Twenty-eight subsidized childcare centers in Miami-Dade County, FL.

**Participants:** Children ages 2 to 5 ( $n = 1,211$ ) and their caregivers.

**Main Outcome Measure:** The BMI percentile and the following 4 factors (via confirmatory factor analysis): food security, consumption of fruits/vegetables, consumption of unhealthy foods, and sedentary behaviors.

**Analysis:** Separate linear mixed models tested relationships between food security and main outcome measures with an interaction term to test for possible moderation by ethnicity.

**Results:** Results indicated a significant relationship ( $P < .05$ ) between food security and child consumption of fruit/vegetables, consumption of unhealthy foods, and sedentary behavior, but not with BMI percentile. With greater food security, Haitians reported greater consumption of fruit/vegetables and sedentary behavior. With greater food security, Cubans and non-Hispanic whites reported less consumption of unhealthy foods, while Haitians reported greater consumption.

**Conclusions and Implications:** Results showed higher food security was associated with higher consumption of fruit/vegetables, consumption of unhealthy foods, and sedentary behavior, but this was moderated by ethnicity. Implications for healthy weight interventions among low-income preschoolers should focus on the importance of food security and tailor intervention strategies for diverse ethnic groups accordingly.

**Key Words:** Food insecurity, preschool children, early childhood, nutrition, physical activity (*J Nutr Educ Behav.* 2015; ■:1-8.)

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## INTRODUCTION

Approximately 25% of 2- to 5-year-olds in the US are overweight, and ethnic minority groups are disproportionately

affected.<sup>1</sup> Obesity rates are higher among Hispanic youth (22.4%) and non-Hispanic black youth (20.2%), compared with their non-Hispanic white peers (14.1%).<sup>2</sup> Haitian and

Hispanic children originating from Cuba, Nicaragua, Colombia, Argentina, Spain, Guatemala, and Honduras have the highest prevalence of overweight individuals when compared with all other groups.<sup>3</sup>

Increased risk for obesity during later childhood and adulthood has been associated with quality and quantity of diet and sedentary lifestyle in early childhood.<sup>4-6</sup> For example, a recent study of obese Cuban American children found that 96% of the sample had unhealthy eating habits and 88% reported a sedentary lifestyle.<sup>7</sup> More specifically, dietary intake is often determined by food security/insecurity and sedentary lifestyle. Food insecurity is lack of access to enough food for an active healthy life, which results from limited or uncertain access to nutritionally adequate and safe foods in

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socially acceptable ways.<sup>8</sup> Both food insecurity and sedentary lifestyle significantly vary across ethnic groups. These variations in dietary intake and sedentary lifestyle likely contribute to health disparities in early-life risk for obesity.<sup>9,10</sup>

The effects of food insecurity may further exacerbate the problem of poorer health and undesirable weight in children.<sup>11,12</sup> In a recent study of 1,522 mothers of toddlers, children of food-insecure mothers were over 3 times as likely to consume soda and 70% less likely to consume vegetables and fruits when compared with food-secure mothers.<sup>13</sup> Moreover, national surveys report that food security disproportionately affects black and Hispanic groups, which leads to undernutrition.<sup>14</sup> Children of immigrants have also been found to be at increased risk for food insecurity as well as poorer health outcomes.<sup>15,16</sup> However, although there is information about the relationship between nutrition habits and food insecurity among larger racial/ethnic groups, much less is known about subgroup differences. Therefore, the authors hypothesized that there would be an association between food security and childhood consumption of fruits/vegetables, childhood consumption of unhealthy foods, childhood sedentary behaviors, and BMI percentile, and that this relationship would be moderated by subgroup ethnicity.

This study examined the relationship between food security and nutrition and sedentary behaviors in a unique high-risk population of underserved families with preschool children. Families came from a variety of ethnic backgrounds (Cuban Hispanics, Hispanics from a variety of other Central and South American countries, non-Hispanic black, and Haitian) that have not historically been well reported in the literature. A further understanding of the relationship between food security and obesity may help inform the content of healthy weight interventions and aid in the reduction of current health disparities.

## METHODS

### Participants

Baseline data from a randomized controlled intervention trial (Clinical Trial # NCT01722032) of the *Healthy*

*Caregivers-Healthy Children* (HC2) program was used for this analysis. Details of the protocol can be found elsewhere.<sup>17</sup> In summary, children ages 2 to 5 years old were randomized to either the intervention arm, receiving a healthy weight management intervention delivered in the childcare center setting, or to a control arm, in which participants received the same level of time and attention from project staff, with unrelated content. Participants were enrolled from 28 subsidized childcare centers in Miami-Dade County, FL from 2010 to 2013. Selection criteria used to determine childcare center eligibility included: (1) > 30 children attended the center; (2) center ethnic makeup was reflective of the Miami-Dade county population; (3) low-income families were served; and (4) center director agreed to participate. All curriculum materials, if not available in Spanish, were translated and back translated into Spanish by certified translators; these translations were vetted by native Spanish-speaking project staff from a variety of countries. Participant responses were collected through interviewer-assisted, paper-based surveys administered at the center. The Institutional Review Board of the University of Miami approved this study protocol, and each child's parent or legal guardian provided informed consent.

### Measures

**Food insecurity.** Food security was measured using 5 survey questions from a standardized Centers for Disease Control and Prevention instrument to measure food insecurity/security.<sup>18</sup> Specifically, caregivers were asked whether they had enough money to buy meals, had balanced meals, skipped meals due to money, ate less than they felt they should, or went hungry because they could not afford more food. For example, questions included: *The food that we bought just didn't last, and we didn't have money to get more* (often true/sometimes true/never true) and *We couldn't afford to eat balanced meals (meals containing 3 different food groups)* (often true/sometimes true/never true).

**Nutrition intake.** The measures of child consumption of fruit and vegetables, child consumption of unhealthy foods, and child sedentary behavior were based on questions from the *Healthy Kids Checklist*.<sup>19</sup> This 32-item rating scale uses parental responses on behalf of their children to report eating and activity habits. With representative visuals and text at the second grade reading level, this checklist has been validated in this population.<sup>20,21</sup>

The child consumption of fruit and vegetables was measured using caregiver responses to 5 survey questions regarding whether their child eats fruits and vegetables, eats multiple types of vegetables a day, eats vegetables with their main meal, and eats fruits as snacks. Sample questions included: *My child eats fruit*, and *My child eats \_\_ vegetables at his main meal*.

The child consumption of unhealthy foods was measured using caregiver responses to 8 survey questions about whether their child eats fried foods or fast food, drinks soda or sports drinks, and eats junk food like chips, candy, and cookies. Sample questions include: *My child eats fast food \_\_ times a week*, *My child drinks soda or sugared drinks with meals*, and *My child eats chips for snacks \_\_ times a day*.

**Physical activity.** Child sedentary behavior was measured using caregiver responses to 4 survey questions from the *Healthy Kids Checklist*<sup>19</sup> regarding television watching and video game playing. Sample questions include: *My child watches TV \_\_ hours a day* and *My child plays video or computer games \_\_ hours a day*.

**Anthropometric variables.** Assessment of body composition included height (by stadiometer, SECA, model 213, Chino, CA) and weight (by digital scale, SECA, model 872, Chino, CA), which were converted to body mass index (BMI, weight [kg]/height [m<sup>2</sup>]) and then to a BMI age- and sex-adjusted percentile.<sup>22</sup> Participants were asked to remove shoes and any heavy outer clothing prior to measurement. Weight and height measurements were collected by trained staff based on US Department of Health and Human Services

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