Research Article

Racial and Ethnic Differences in the Home Food Environment Explain Disparities in Dietary Practices of Middle School Children in Texas

Nalini Ranjit, PhD; Alexandra E. Evans, PhD; Andrew E. Springer, DrPH; Deanna M. Hoelscher, PhD; Steve H. Kelder, PhD

ABSTRACT

Objective: To examine racial and ethnic differences among middle school children in the home food environment (HFE) and the extent to which associations of healthy and unhealthy eating with the HFE differ by race and ethnicity.

Design: Cross-sectional secondary analyses of baseline data from Coordinated Approach to Child Health Middle School, a school-based intervention targeting obesity and obesogenic behaviors among middle school children in Austin, TX.

Participants: A total of 2,502 children (mean age, 13.9 years; 58% Hispanic, 28% white, and 14% black).

Variables Measured: Availability and accessibility of healthy foods, and parental support of healthy eating, and family meals. Consumption of both healthy and unhealthy foods was examined.

Analysis: Differences across racial and ethnic groups in aspects of HFE were estimated using linear regression. Models also examined racial and ethnic differences in consumption of healthy and unhealthy foods. If adjusting for HFE, such differences were accounted for.

Results: White children had significantly better HFEs than Hispanic and black children with greater availability and accessibility of healthy foods ($P < .001$). Adjusting for a healthy HFE reduced disparities in consumption of healthy foods but not in consumption of unhealthy foods.

Conclusions and Implications: Improved HFE may increase healthy eating among ethnic minorities but is unlikely to reduce unhealthy eating.

Key Words: home food environment, racial/ethnic disparities, healthy eating, unhealthy foods (*J Nutr Educ Behav*. 2015;47:53-60.)

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INTRODUCTION

Disparities in childhood obesity by race and ethnicity have continued to expand over time while the overall pace of obesity increase has begun to slow down.[1-3] Such differences in obesity emerge as early as preschool,[4] continue into adulthood, and may even widen over the life course.[5] These pernicious disparities in obesity reflect the influence of both dietary and physical activity behaviors, which have been shown in multiple studies to be patterned by race and ethnicity.[6-8] There is a general consensus that this patterning of behavior stems from the constellation of economic, social, and cultural factors that characterize the usual living conditions of poor and disadvantaged minorities. For example, extensive research documents that the communities in which ethnic minorities reside are disproportionately subject to increased availability of energy-dense foods, reduced availability of affordable healthy options, and built environments that offer little opportunity for safe recreational physical activity.[9-11] However, there is little literature documenting whether exposure to more proximal environments, such as the home food and activity environments, is similarly patterned, and if so, whether such differential exposure underlies the observed racial and ethnic disparities in obesity and in behaviors leading to obesity.[11]

Substantial evidence points to the home food environment, as structured by parents, as a key cause of poor dietary practices and obesity. Parents model eating behaviors, food choices, and taste preferences[12,13]; in addition, they can employ specific behavioral strategies such as restricting or encouraging consumption of specific foods and food groups[14] and structure the home food and mealtime environments to facilitate availability and accessibility of specific foods[15,16] as well as regular family meals together,

Michael and Susan Dell Center for Healthy Living, University of Texas Health Science Center at Houston School of Public Health, Austin Regional Campus, Austin, TX

Address for correspondence: Nalini Ranjit, PhD, Michael and Susan Dell Center for Healthy Living, University of Texas Health Science Center at Houston School of Public Health, Austin Regional Campus, 1616 Guadalupe St, Ste 6.300, Austin, TX 78701; Phone: (512) 391-2527; Fax: (512) 482-6185; E-mail: Nalini.Ranjit@uth.tmc.edu

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including breakfast at home.[17,18] Although much of this literature is focused on the development of young children's eating habits,[19-21] research suggests that familial influences on eating habits continue into adolescence.[15,22,23]

Surprisingly, given the importance of the home food environment, there is little research examining the prevalence and consequences of systematic differences in the home food environment by race and ethnicity, although it is known that such environments are socioeconomically patterned.[16] In the research reported here, the authors sought to address this gap in the literature by examining differences in home food environments of middle school students by race and ethnicity and by exploring the role of home food environment in diet and obesity disparities. Specifically, the objectives of this study were to examine (1) the magnitude of racial and ethnic gaps on multiple measures of the home food environment, (2) differences in healthy and unhealthy diet and eating practices across racial groups, and (3) the extent to which racial and ethnic differences in diet and eating practices are explained by differences in the home food environment.

METHODS

Data and Measures

Data for these analyses were drawn from the baseline sample of the Coordinated Approach to Child Health (CATCH) Middle School program, a school-based obesity intervention program designed for students in the Central Texas area.[24] Eighth-grade students from 30 middle schools randomly selected from 5 school districts in the area were invited to participate, and measures were administered to consenting students in 2009. Measures relevant to this analysis were primarily self-reported measures, collected via surveys completed by students in the classroom during advisory period. In addition, trained study staff measured height with a portable stadiometer (Portable Adult Measuring Unit PE-AIM-101, Perspective Enterprises, Portage, MI) and weight with a portable digital scale (Tanita BWB-800S, Tanita Corporation of America, Inc, Arlington Heights, IL). All analyses reported here are cross-sectional and used only the baseline data from this program, collected in 2009.

Demographic data available for students included age in years, sex, and ethnicity. These analyses were limited to children from the 3 major ethnic groups: white, black, and Hispanic. School-level data indicating the percentage of children eligible for free and reduced meals obtained from state administrative records were used as a proxy measure of school-level economic disadvantage or socioeconomic status (SES), following previous research with Texas students.[25,26] Body mass index (BMI) was obtained from height and weight data and converted to age- and sex-specific BMI *z*-scores, as per guidelines from the Centers for Disease Control and Prevention.[27] Language spoken at home (English or other) was used as a measure of acculturation.

Measures of the home food environment obtained in the study were adapted from published studies[28,29] and have adequate face and content validity. These analyses included measures of home availability of healthy foods in the past week (range, 0–9; obtained as a sum of 3 items [availability of vegetables, fruit, and fruit juice], each scored on a 4-point rating scale ranging from *never*, through *some of the time*, *most of the time*, and *all the time*), and easy access to healthy foods in the past week (range, 0–6; obtained as a sum of 2 items [fruits and vegetables], each with 4 ordinal response categories as listed above). Although related, availability and accessibility measure different aspects of the home food environment; specifically, both availability and accessibility are needed to motivate children's consumption of fruits and vegetables when preference for these items is low.[30] Other items included parental encouragement of healthy eating (range, 0–20; which included 5 Likert-scaled items pertaining to consumption of fruits and vegetables, low-fat milk, water instead of a sugar-sweetened beverage (SSB), whole grain, and regular breakfast; response options were in 5 graded categories from *never* to *always*), number of family meals in the past week (range, 0 to ≥ 7), and number of days that breakfast was consumed at home in the past week (range, 0–7). A composite home food environment score was constructed as the sum of all of these items after rescaling them to SD units (range, –10.1 to 6.5; mean, 0 [SD, 3.1]; Cronbach $\alpha = .66$).

Measures of dietary practices were drawn from 11 items on the survey that queried respondents on the frequency of usual weekday consumption of specific marker foods or food groups. Response categories on these items ranged from *never* through ≥ *5 times/d*. A healthy diet index (range, 0–20; Cronbach $\alpha = .66$) was developed for this study as a sum of items referencing usual consumption of fruit (including juice) and vegetable, milk, and whole grains. Likewise, an unhealthy diet index (range, 0–15; Cronbach $\alpha = .69$) was constructed as a sum of items examining usual consumption of chips, SSBs (soda and fruit-flavored drinks), and caffeinated beverages (coffee or tea and energy drinks). In addition, some of the constituent items were examined singly or in groups as follows: usual fruit and vegetable intake, including juice (range, 0–15), usual healthy beverages (milk or water; range, 0–10), usual SSB intake (range, 0–10), and usual salty snack intake (range, 0–5). Another dietary constituent of interest to the researchers was dessert intake. Because there were no questions relating to usual intake of sweets and dessert, reported frequencies of previous day consumption of each of 4 different types of dessert items were summed into a dessert intake index (range, 0–20; Cronbach $\alpha = .84$), which was then used as a proxy for usual dessert intake.

Statistical Analysis

Socioeconomic and demographic characteristics of the data were examined for the total sample, as well as for each of the 3 racial and ethnic groups, as means for continuous measures, and frequency distributions for categorical measures. The researchers evaluated differences across racial and ethnic groups on these characteristics using *F* test for continuous measures and chi-square statistics for categorical measures (Table 1). Spearman's correlations, partialing out the effects of age, sex, and BMI, between each