The Neighborhood Food Environment, Food Stamp Program Participation, and Weight-Related Outcomes of Low-Income Women

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BACKGROUND AND METHODOLOGY:

A growing number of federal, state, local, and nonprofit initiatives have arisen to foster the development of supermarkets and establishments selling healthy food in low-income communities. These initiatives are typically framed by the assumptions that increasing the availability of these types of establishments will lead to an increased frequency of shopping at supermarkets and stores selling healthy food, lower-calorie and more-nutritious food choices, healthier weight status, and a lower incidence of weight-related comorbidities for neighborhood residents. However, the validity of these assumptions has not been established, as there is very little empirical research on the relationship between the neighborhood food environment and food shopping decisions; there is no previous research on the relationship between the neighborhood food environment and energy intake; and findings on the relationship between the neighborhood food environment and weight status are inconsistent across studies.

Using a sample of low-income women, this study fills in some of the gaps in the previous research by examining whether the availability of food retail and food service establishments in a woman’s neighborhood of residence (her “neighborhood food environment”) was associated with decisions about where and how frequently to purchase food, daily energy intake, and weight status. It also explored whether these associations differed for Food Stamp Program (FSP) participants compared to low-income nonparticipants.

Restricted-access geocoded data from the 2007–2008 National Health and Nutrition Examination Survey was combined with 2007–2008 ZIP Code Business Patterns data measuring the availability of supermarkets, small grocery stores, convenience stores, full-service restaurants, and fast-food restaurants in a person’s ZIP Code Tabulation Area of residence. Three food spending variables were used as outcomes: food spending in the past month per family member, the percentage of the monthly family food budget that was spent at grocery stores, and the percentage of the monthly family food budget that was allocated to eating out or on carry-out or delivered food. Other food purchase behaviors used as outcomes were the number of fast-food meals eaten in the past week, the frequency of major food shopping trips, and usual travel time to the grocery store. Energy intake calculated from the dietary intake interviews, body mass index (BMI), and obesity were also used as outcomes.

Ordinary Least Squares models of the weight-related outcomes were estimated that included an indicator for household FSP participation in the previous year and either a set of separate neighborhood food establishment density variables or neighborhood food environment composite variables formed using factor analysis. All models controlled for a large set of additional individual and environment characteristics.
FINDINGS:

In the models of weight-related outcomes that included separate neighborhood establishment density variables, there were very few significant associations between the individual establishment density variables and the outcomes. However, the neighborhood establishment density variables were jointly significantly associated with many of the outcomes. Highly correlated neighborhood food environment variables may explain why these variables have often been insignificant in previous studies and why there have been inconsistent findings across studies. Previous research on adults has not used neighborhood food environment composites developed using factor analysis.

In models including neighborhood food environment factors, higher neighborhood density of “small or quick” establishments was significantly associated with spending more of the family food budget at grocery stores, eating more fast food meals, less frequent major grocery shopping trips, higher BMI, and a higher likelihood of obesity. The findings suggest that “small or quick” establishments are used more frequently as their density increases, which results in more fast food meals and less frequent major grocery shopping trips, and that these behavior changes are accompanied by increased BMI and an increased likelihood of obesity.

Higher neighborhood density of supermarkets and restaurants was associated with significantly fewer fast food meals per week, more frequent major grocery shopping trips, lower BMI, and a lower likelihood of obesity. These findings suggest that living in a neighborhood with more of these types of establishments results in substitution towards more frequent shopping at supermarkets and away from fast food, and that these behavior changes are accompanied by decreased BMI and a decreased likelihood of obesity.

Although FSP participants and low-income nonparticipants appear to respond similarly to neighborhood food environments, FSP participants lived in neighborhoods with a significantly higher mean density of “small or quick” establishments. This results in both a higher predicted BMI and likelihood of obesity for FSP participants relative to low-income nonparticipants.

The empirical analysis provides strong support for the argument that the neighborhood food environment is associated with the food shopping behaviors and weight-status outcomes of low-income women. However, the magnitudes of the estimated relationships suggest that the changes in behavior that would accompany changes in the neighborhood food environment such as the opening of a new supermarket are likely to be quite small.

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