Food Environment Quality and Food Choice in Clusters of Colonias in Hidalgo County of the Texas Rio Grande

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BACKGROUND OF STUDY:

Families that reside in areas of persistent poverty face individual, family, and environmental challenges to food security and healthful eating. The economic and social burden posed by nutrition-related chronic health conditions (e.g., obesity, cardiovascular disease, and diabetes) is tremendous. The burden becomes greater for children and adults, who are poor, Hispanic, reside in colonias along the Texas border with Mexico, and face greater vulnerability to food insecurity, poor nutritional health and adverse health outcomes. Personal, structural, and neighborhood characteristics serve as barriers or enhancements to lifestyle behaviors such as physical activity or healthy eating. Residents of colonias face the greatest structural and neighborhood disadvantage, such as substandard housing areas, inadequate roads, and poor access to community food resources. This makes it particularly difficult for children and adults in these areas to initiate or maintain lifestyle changes that are critical for the prevention of disease conditions. Thus, the goals of this study were (a) to assess the food environment through direct observation in targeted colonia census block groups in Hidalgo County; (b) to determine the geospatial characteristics of food environment accessibility; and (c) to examine the association between neighborhood deprivation (CBG-level neighborhood SES) and locational disadvantage for access to food stores and food service places.

METHODS:

The study area included 197 census block groups, an urban and rural land area of approximately 772 square miles, and a population of more than 423,000 people (87% Hispanic). The types of food stores and food service places were defined using a modified version of the 2002 North America Industry Classification System (NAICS) definitions. Food stores (FS) were distinguished as being supermarkets and grocery stores, convenience stores or food marts, discount stores (general merchandise and some perishable and non-perishable foods), beverage stores (with some perishable and non-perishable foods), pharmacies and drug stores (with some perishable and non-perishable foods), and specialty food stores (e.g., meat markets, fish and seafood markets, fruit and vegetables markets, baked goods not for immediate consumption) that are fixed or mobile. Food service places (FSP) were classified as full-service restaurants (patrons order and are served while seated and pay after eating), fast food restaurants (limited-service where patrons order or select items and pay before eating), cafeteria/buffet, snack and nonalcoholic beverage bars (e.g., ice cream, frozen yogurt, snow cones, coffee, or juices for consumption on or near premises), drinking places (provide limited food services), and microenterprises, such as a food stand which offers food for the public and operates secondary to a non food-related business (e.g., repair shop, hardware store, or beauty salon) or residence. Observers were trained to use GPS technology for enumerating and geocoding all FS and FSP at the level of individual address and conducted unobtrusive outside
audits using a structured checklist through direct observation in systematically driven CBG’s. Neighborhood (CBG-level) deprivation was determined through construction of an index of socioeconomic variables from the 2000 U.S. census and categorized from low to very high deprivation. Locational disadvantage was determined through calculations of network distance from CBG centroid to the nearest FS and FSP. Stability and difference in locational disadvantage between types of FS and FSP was examined.

FINDINGS/DISCUSSION:

This study identified and geocoded 971 different food stores (FS) and food service places (FSP) through direct observation. Of the 18 supermarkets/ grocery stores, 10 were locally-owned; 2 were rated as being medium-sized and 5 as small grocery stores. There were 255 convenience stores identified; almost 65% of all convenience stores marketed gasoline; 19.5% offered drive-thru shopping; 47% marketed fast food items; and 23% marketed grocery items. Of the 97 specialty food stores, 31% were fruit and/or vegetable stores and 35% were baked goods stores; 26.8% did not have a fixed location. There were 204 FSP (21% of all FS and FSP) that exclusively sold fast food items; 44% were national chain stores. In areas of high or very high neighborhood deprivation, an average of 15%-16% (CBG range 2.7%-53%) of households did not have access to a vehicle.

The average network distance from the center of the census block group (CBG) to the nearest supermarket/grocery store was 2.7 miles (median 2.3 miles) and ranged from 0.18 mile to 14.9 miles; the average distance to the nearest large supermarket was 3.0 miles (median 2.7 miles); and the average distance to the nearest convenience store was 1.1 miles (median 0.90 miles; range 0.05 mile to 4.8 miles). Almost 32% (n = 63) of all 197 CBG experienced very high locational disadvantage for access to a large supermarket. Among CBG with very high locational disadvantage, distance to the nearest supermarket/grocery store increased significantly with greater deprivation; low deprivation CBG were an average of 4.1 miles to the nearest supermarket/grocery store, medium deprivation CBG 4.5 miles, high deprivation CBG 5.5 miles, and very high CBG 6.0 miles (p <0.01). After combining categories of locational disadvantage for supermarkets/ grocery stores with convenience stores, overall locational disadvantage for FS was determined. The map to the right shows neighborhood deprivation and overall locational disadvantage for FS. Moreover, 20.3% of CBG (n = 40) were classified as CBG with both high FS and FSP locational disadvantage.

This study is the first step in understanding the influence of the food environment on food choice and diet quality in Hispanic families who live in high or persistent poverty areas, such as the growing number of colonias where there is limited or non-existent public transportation and where many residents do not have access to a vehicle. Knowing more about the food environment is essential for combining environmental approaches with traditional health interventions and food assistance programs to make it easier for individuals to make healthier food choices.

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