



ELSEVIER

Contents lists available at ScienceDirect

## Preventive Medicine

journal homepage: [www.elsevier.com/locate/ypmed](http://www.elsevier.com/locate/ypmed)

## The neighborhood environment and obesity: Understanding variation by race/ethnicity

Michelle S. Wong<sup>a,\*</sup>, Kitty S. Chan<sup>a</sup>, Jessica C. Jones-Smith<sup>b</sup>, Elizabeth Colantuoni<sup>c</sup>, Roland J. Thorpe Jr<sup>d</sup>, Sara N. Bleich<sup>e</sup>

<sup>a</sup> Department of Health Policy and Management, Johns Hopkins School of Public Health, 624 N. Broadway, Baltimore, MD 21205, USA

<sup>b</sup> Department of Health Services & Epidemiology, School of Public Health, University of Washington, 1959 NE Pacific St, Seattle, WA 98195, USA

<sup>c</sup> Department of Biostatistics, Johns Hopkins School of Public Health, 615 N. Wolfe St, Baltimore, MD 21205, USA

<sup>d</sup> Department of Health, Behavior, and Society, Johns Hopkins School of Public Health, 624 N. Broadway, Baltimore, MD 21205, USA

<sup>e</sup> Harvard T.H. Chan School of Public Health, 677 Huntington Avenue, Boston, MA 02115, USA

## ARTICLE INFO

## Keywords:

Obesity  
Resident characteristics  
Health status disparities  
Minority health

## ABSTRACT

Neighborhood characteristics have been associated with obesity, but less is known whether relationships vary by race/ethnicity. This study examined the relationship between soda consumption – a behavior strongly associated with obesity – and weight status with neighborhood sociodemographic, social, and built environments by race/ethnicity. We merged data on adults from the 2011–2013 California Health Interview Survey, U.S. Census data, and InfoUSA ( $n = 62,396$ ). Dependent variables were soda consumption and weight status outcomes (body mass index and obesity status). Main independent variables were measures of three neighborhood environments: social (social cohesion and safety), sociodemographic (neighborhood socioeconomic status, educational attainment, percent Asian, percent Hispanic, and percent black), and built environments (number of grocery stores, convenience stores, fast food restaurants, and gyms in neighborhood). We fit multi-level linear and logistic regression models, stratified by individual race/ethnicity (NH (non-Hispanic) Whites, NH African Americans, Hispanics, and NH Asians) controlling for individual-level characteristics, to estimate neighborhood contextual effects on study outcomes. Lower neighborhood educational attainment was associated with higher odds of obesity and soda consumption in all racial/ethnic groups. We found fewer associations between study outcomes and the neighborhood, especially the built environment, among NH African Americans and NH Asians. While improvements to neighborhood environment may be promising to reduce obesity, null associations among minority subgroups suggest that changes, particularly to the built environment, may alone be insufficient to address obesity in these groups.

## 1. Introduction

Although obesity prevalence is stabilizing in the United States (Flegal et al., 2012), non-Hispanic (NH) African Americans and Hispanics remain disproportionately affected (Ogden et al., 2014) and the rate of obesity continues to increase among NH Asians, especially in younger generations (Nam, 2013). Obesity outcomes have been associated with characteristics of the built, sociodemographic and social environments (Carroll-Scott et al., 2013; Feng et al., 2010; Kimbro and Denney, 2013; Kirby et al., 2012; Li et al., 2014; Powell-Wiley et al., 2014; Suglia et al., 2016). Within the built environment (e.g., grocery stores, parks), findings are mixed (Carroll-Scott et al., 2013; Feng et al., 2010). Sociodemographic environment, including neighborhood

socioeconomic status (SES) (Kimbro and Denney, 2013; Powell-Wiley et al., 2014) and racial/ethnic composition, has been more consistently associated with obesity (Kirby et al., 2012; Li et al., 2014). Social environment, defined as the relationships, groups, and social processes within a neighborhood (Carroll-Scott et al., 2013), is less well studied, but higher social cohesion and social capital have been associated with lower obesity prevalence (Carroll-Scott et al., 2013; Suglia et al., 2016).

Neighborhood environment may contribute to observed differences in obesity prevalence across racial/ethnic subgroups. It is possible that the relationship between obesity and neighborhood characteristics vary by race/ethnicity; some neighborhood characteristics may matter for some subgroups. For example, among recent immigrants, particularly Asians and Hispanics, evidence suggests that traditional eating

\* Corresponding author at: VA HSR&D Center for the Study of Healthcare Innovation, Implementation, & Policy, U.S. Department of Veteran Affairs, 11301 Wilshire Blvd, Los Angeles, CA 90073, USA.

E-mail address: [michelle.wong6@va.gov](mailto:michelle.wong6@va.gov) (M.S. Wong).

<https://doi.org/10.1016/j.ypmed.2017.11.029>

Received 17 July 2017; Received in revised form 13 October 2017; Accepted 26 November 2017  
0091-7435/ Published by Elsevier Inc.

practices (Guendelman and Abrams, 1995; Wang et al., 2011) may buffer against negative neighborhood influences. In contrast, NH African Americans may be more susceptible to neighborhood influences because they, on average, have fewer individual-level socioeconomic resources in comparison to NH Whites (Pew Research Center, 2016). However, few studies have considered racial/ethnic variation in the associations between obesity and the neighborhood environment. Failure to examine these relationships by race/ethnicity could hinder the identification of effective interventions or policies for addressing persistent disparities in obesity and reducing population obesity. Of the studies that examined relationships between neighborhood and obesity by race/ethnicity (Lovasi et al., 2009a), most have focused on neighborhood racial/ethnic composition or food environment (Jones-Smith et al., 2013; Morland et al., 2002; Powell et al., 2007; Yi et al., 2014). To our knowledge, few studies have considered race/ethnic variations for other built and sociodemographic characteristics (Kirby et al., 2012; Zeigler-Johnson et al., 2013), and none for the social environment.

This study examined the associations between soda consumption – given the strong link between soda consumption and obesity risk (Hu, 2013) – and weight status with characteristics of the built, socioeconomic, and social environments by individual race/ethnicity.

We hypothesized that neighborhoods with high social support, high neighborhood socioeconomic status, and protective built environment characteristics would be associated with positive outcomes for all groups (Carroll-Scott et al., 2013; Feng et al., 2010; Powell-Wiley et al., 2014), and that more of these positive neighborhood characteristics would be associated with obesity outcomes for NH Whites and NH African Americans. We further hypothesized that living among others from the same ethnic group would be associated with better obesity outcomes among NH Asians and Hispanics (since ‘ethnic enclaves’ have previously been associated with better diet for these populations (Osypuk et al., 2009)), but worse outcomes among NH African Americans (since institutional racism against African Americans, such as the process of redlining, has led to highly segregated, mostly urban neighborhoods which have been associated with negative health outcomes (Williams and Collins, 2001)).

## 2. Materials and methods

### 2.1. Data and sample

Individual-level and social environment data were obtained from the 2011–2013 California Health Interview Survey (CHIS) (California Health Interview Survey, 2014). The CHIS, representative of California's non-institutionalized population, was designed to provide population estimates for California's major race/ethnic groups. Our study sample included adults, aged  $\geq 18$  ( $n = 62,396$ ), excluding pregnant women, underweight individuals, and individuals in the “other” race/ethnicity category ( $n = 3285$ ).

Neighborhoods were defined by census tracts. We merged data from 2011 to 2013 InfoUSA (InfoUSA, 2015), and 2009–2013 5-year U.S. Census's American Community Survey (U.S. Census Bureau, 2009–2013) to the CHIS through census tract identifiers to provide information about the built and sociodemographic environments, respectively. InfoUSA is a commercially available database commonly used in this area of research that obtains data about businesses, including type and location, from a variety of sources, such as Yellow Page directories, business filings, and corporate websites (InfoUSA, 2015).

### 2.2. Measures

#### 2.2.1. Dependent variables

The outcomes were soda consumption and weight status. Soda consumption was based on self-report and dichotomized into any soda (i.e., 1 or more) in the previous week vs. none, which is consistent with

prior research that characterizes consumption of at least 1 soda per week as “frequent” consumption (Ma et al., 2016).

Weight status outcomes included a continuous measure of body mass index (BMI) – calculated from self-reported height and weight – and a dichotomized indicator of obese or non-obese using WHO definitions (World Health Organization, 2016).

#### 2.2.2. Main independent variables

Neighborhood sociodemographic, social, and built environments are represented by three different, non-overlapping sets of variables. The sociodemographic environment is represented by census-tract level measures of neighborhood SES (median household income, and educational attainment (percent with a high school degree or less)) and racial/ethnic composition (percent Hispanic, black, and Asian). All sociodemographic environment variables were modeled as continuous measures. Median household income was scaled by \$10,000 increments. Other sociodemographic measures were scaled by 10 percentage point increments.

A neighborhood's social environment was assessed by 4 CHIS questions asked of all adult respondents. Through factor analyses, we identified two distinct neighborhood social environment measures – social cohesion and safety – which corresponded with the theoretical understanding of the neighborhood social environment (Diez Roux and Mair, 2010). Social cohesion was based on three questions: whether respondents perceived their neighbors as willing to help each other out, trustworthy, and watching out for the safety of children in the neighborhood. Responses to each of these questions were on a 4-point scale of strongly disagree, disagree, agree, or strongly agree. We summed the responses across the 3 questions to create a single continuous measure ranging from 0 (low social cohesion) to 9 (high social cohesion). Neighborhood safety was based on a single question of how often (all, most, some, and none of the time) respondents felt safe in their neighborhood, and dichotomized into safe (all the time) vs. not safe (< all of the time).

For the built environment, we included separate measures of the number of convenience stores, supermarkets/grocery stores, fast food outlets (limited service restaurants and pizza restaurants), and fitness and recreational sports centers within each census tract. These businesses were identified through the North American industry Classification System (NAICS) codes.

Additional information on each of these measures is available in appendix Table A1.

#### 2.2.3. Potential confounding variables

We controlled for potential individual-level confounders, including demographic characteristics (age, gender, education), health behaviors (current smoking status), residential characteristics (urban/rural, years at current residential address), and acculturation. Acculturation was assessed by a measure of English proficiency and a 5-level composite variable of nativity/generational status/time in U.S.: U.S. born, both parents born in the U.S.; U.S. born, one parent born in the U.S., U.S. born, neither parent born in the U.S.; foreign born, > 15 years in the U.S.; and foreign born, or < 15 years in the U.S.

### 2.3. Statistical analysis

We accounted for CHIS's complex survey design to calculate summary statistics for all variables of interest stratified by the following racial/ethnic groups: NH White, NH African American, Hispanics, and NH Asians.

The data are hierarchical with persons (level-1 units) nested within census tract (level-2 units). To assess the relationship between soda consumption and weight status with the neighborhood environments for NH White, Hispanic, NH African American, and NH Asian subgroups, multi-level linear and logistic regression models were fit separately for each neighborhood environment, stratified by race/ethnicity

Download English Version:

<https://daneshyari.com/en/article/8693599>

Download Persian Version:

<https://daneshyari.com/article/8693599>

[Daneshyari.com](https://daneshyari.com)