Built Environment Associations With Health Behaviors Among Hispanics

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**Background:** Few studies of the built environment and physical activity or other health behaviors have examined minority populations specifically. The purpose of this study was to examine associations between the built environment and multiple health behaviors and outcomes among Hispanic adults. **Methods:** Community partners distributed surveys (n = 189) in 3 communities in southwest Kansas. Logistic regression was used to examine relationships between neighborhood perceptions and 4 outcomes. **Results:** Meeting physical activity recommendations was associated with the presence of sidewalks and a safe park, and inversely related to higher crime. Residential density and shops nearby were related to active commuting. Sedentary behavior was inversely related to having a bus stop, bike facilities, safe park, interesting things to look at, and seeing people active. Finally, seeing people active was positively associated with being overweight. **Conclusions:** This study suggests that among Hispanics, many built environment variables are related to health behaviors and should be targets for future neighborhood change efforts and research.

**Keywords:** neighborhood perceptions, physical activity, sedentary behavior, Latino adults

Though rates of physical activity within the U.S. in general are low, the problem is especially glaring among persons from Hispanic backgrounds. By 2050, it is estimated that Hispanics will account for almost 25% of the U.S. population. Nationally, only 42% of Hispanics reported achieving recommended levels of physical activity compared with 52% of Caucasians, and 36% of Hispanics reported no leisure time physical activity. Mexican-Americans of all ages and sexes are more likely to be at unhealthy weights compared with their Caucasian counterparts and have a higher prevalence and greater morbidity and mortality from cardiovascular disease and type 2 diabetes.

To improve physical activity and health among Hispanics, factors related to physical activity participation within this group must be identified. Several studies have noted associations with a variety of personal, interpersonal, and sociological issues, including low levels of literacy, lower educational attainment, higher poverty rates, low levels of social support and capital especially among new immigrants, real or perceived time limitations due to work commitments, fear of crime, and limited acculturation. However, few, if any, studies have included a concerted focus on understanding how neighborhood and community factors influence physical activity behaviors within this population.

The built environment is a term that “comprises urban design, land use, and the transportation system, and encompasses patterns of human activity”; it is increasingly recognized as an important determinant of individual and population-level health. Several elements of the physical and social environment (eg, density, access to destinations, street connectivity, transportation systems and infrastructure, parks and recreation settings, safety from crime and traffic, neighborhood aesthetics, and social cohesion, among others) have been found to be associated with increased walking, biking, and other recreational and transport-related activity. However, relatively little research has examined how community or neighborhood-level variables are associated with physical activity or sedentary behavior among minority groups. In a study of over 450 adults in El Paso, Texas, 79% of whom were Hispanic, Rutt and Coleman reported that increased mixed land-use was related to higher BMI, which was unexpected. However, to the best of our knowledge, this is the only study to examine the built environment and health behavior within a primarily Hispanic population.

**Purpose**

The purpose of this study was to examine associations between elements of the built environment and physical activity, active commuting, sedentary behavior, and body
mass index among Hispanic adults. Better understanding how these relationships operate within this population can provide evidence to support future neighborhood design and research efforts aimed at improving the health of Hispanic communities.

Methods

Study Area and Data Collection

In Kansas, 8% of the population is Hispanic/Latino, with the majority of these individuals living in the southwest area of the state. This study was conducted in 3 counties in Southwest Kansas. Each county was designated as rural according to the United States Department of Agriculture rural-urban continuum codes (categories 5–7), though each contains a small urban center: Finney County (Garden City: 2000 pop. 28,451), Ford County (Dodge City: 2000 pop. 25,176), and Seward County (Liberal: 2000 pop 19,666). Participants were recruited from the cities and did not reside in the outlying rural areas around these urban centers. These counties are geographically located near the Colorado and Oklahoma borders and have a prosperous local economy based primarily on agriculture, meat-packing, and cattle feedlots, which are the major employers for Hispanics in this region. As of 2000, persons of Hispanic origin (primarily Mexican-American) comprised 40%–50% of the population in each county, with Finney County recently declared a minority-majority county by the U.S. Census Bureau. County census data predict a substantial increase (50%–75%) in population by 2040, with the greatest proportion of this increase being Hispanic.

The data for this study were obtained from a recently completed Hispanic Health Needs Assessment to identify health needs, preferences, and norms for healthcare access and health behaviors within these communities. Because of the difficulty in enumerating a transient subpopulation and because of the desire to use a community-based participatory approach to conduct the needs assessment, community partners within the 3 counties were responsible for recruiting community members to participate in the survey. These community partners included representatives from local health departments, community health clinics, local employers, English-second-language coordinators, faith-based organizations, hospitals, and community colleges and were familiar with health in general and/or issues related to the needs of the Hispanic subpopulation within their city/county. The eligibility criteria to complete the survey included 1) self-report as being of Hispanic ethnicity, 2) being 18 years of age or older, 3) reporting residence in 1 of the 3 communities, and 4) able to read and write in English or Spanish. Community partners recruited individuals associated with their organizations who fit the eligibility criteria. The self-administered survey was developed in English to have no greater than a 6th-grade reading level, translated into Spanish, and made available in both languages. The study was reviewed and approved by the institutional review board at Kansas State University.

Measures

Demographic Variables. The questionnaire included sociodemographic questions about gender, age, education level, height and weight, presence of children in the household, and number of operational vehicles in the household.

Built Environment. Perceptions of the neighborhood environment were measured with the International Physical Activity Questionnaire Environmental Module (IPAQ-E), also sometimes referred to as the International Prevalence Study Environmental Module. This study analyzed 10 of the 11 core/recommended items, excluding a question about the number of vehicles in the household (which was instead used as a covariate). One of the core items (density) asks about the main type of housing in the respondent’s neighborhood. For the present analyses, responses were grouped as “detached single-family housing” versus all other options. The other 9 items are shown in Table 1. We also added one specific item of interest that has not been previously examined: “There is a safe park in my neighborhood” (safe park). For these latter 10 items, participants responded on a 4-point scale ranging from “strongly disagree” (1) to “strongly agree” (4). As is customarily done in studies using this measure, we categorized neighborhood perceptions into 2 levels: disagree (1–2 on the 4-point scale) versus agree.

Physical Activity. Physical activity was measured via questions from the Behavioral Risk Factor Surveillance System questionnaire. Specifically, participants were asked separately about the number of days in a usual week that they engaged in moderate and vigorous activities for at least 10 minutes at a time and the number of minutes per day that they spent on those activities. The number of days and minutes per day were multiplied to obtain a weekly total for each of moderate and vigorous physical activity (eg, 4 days × 30 minutes per day = 120 minutes per week). For our analyses, we dichotomized participants as meeting physical activity recommendations if they obtained 150 minutes of combined moderate and vigorous physical activity or at least 75 minutes of vigorous physical activity.

Active Commuting. To measure active commuting behavior, participants reported the average number of days per week they walked or biked to or from work. Active commuting was dichotomized as none (0 days per week) versus some (1–7 days).

Sedentary Behavior. Sedentary behavior was measured using 2 questions asking about the number of hours per day outside of work participants spent a) watching television, videos, or playing video games; and b) using a computer. For both questions, 4 response options were provided: less than 1 hour/day, 1–3 hours per day, 4–5 hours per day, and more than 5 hours/day.
analyses, participants were grouped into 2 categories: those who reported at least 1–3 hours per day for both sedentary activities (“more sedentary”) compared with those who reported less than 1 hour per day for both activities or 1–3 hours for one activity and less than 1 hour for the other activity (“less sedentary”).

Body Mass Index. Body mass index was calculated using self-reported height and weight and the standard formula for adults [weight(kg)/height(m)²] and participants were grouped in 2 categories: under/normal weight (< 25) and overweight/obese (≥ 25).

Analyses
Logistic regression was used to analyze the independent associations between each of the 11 neighborhood environment variables individually and the 4 dichotomous outcome variables. Initially, no covariates were included to examine the unadjusted odds when participants agreed with each neighborhood variable of meeting physical activity recommendations, active commuting at least once per week, engaging in a higher level of sedentary behavior, or being overweight/obese. Subsequently, we conducted logistic regression to examine the adjusted associations while controlling for known correlates of activity/inactivity, including the participant’s gender, age, education level, presence of children in the household, number of vehicles in the household, and community of residence. All analyses were conducted using SPSS 17.0 and associations were deemed significant at $P < .05$.

Results
In total, 189 completed surveys were collected (Finney County/Garden City = 68, Ford County/Dodge City = 70, Seward County/Liberal = 51). 69% of the participants were female, 51% were over the age of 30 (Mean years = 32.0, SD = 10.2), 56% were married, 45% were high school graduates, 60% were employed full-time and 14% part-time, 84% had children in the household (Mean number of children = 1.9, SD = 1.2), and 82% completed the survey in Spanish. As shown in Table 1, just over half of participants (56%) reported meeting physical activity recommendations, 43% actively commuted at least once per week (Mean days = 1.5, SD = 2.0), 61% reported a higher level of sedentary behavior, and 61% were overweight or obese (Mean BMI = 27.9, SD = 10.2). Table 1 also shows the percentage of respondents who agreed or disagreed with each neighborhood variable, with the lowest level of agreement being for traffic (27%) and the highest for seeing people being active (69%).

Table 1 Sample Descriptive Statistics for Outcome Variables and Neighborhood Characteristics

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets physical activity recommendations</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>Active commuting at least once per week</td>
<td>43%</td>
<td>57%</td>
</tr>
<tr>
<td>Higher level of sedentary behavior</td>
<td>61%</td>
<td>39%</td>
</tr>
<tr>
<td>Overweight/obese</td>
<td>61%</td>
<td>39%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neighborhood characteristic</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential density</td>
<td>42%</td>
<td>58%</td>
</tr>
<tr>
<td>Shops</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>Bus stop</td>
<td>59%</td>
<td>41%</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>63%</td>
<td>37%</td>
</tr>
<tr>
<td>Bike facilities</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Recreation facilities</td>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>Crime</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>Traffic</td>
<td>27%</td>
<td>73%</td>
</tr>
<tr>
<td>See people active</td>
<td>69%</td>
<td>31%</td>
</tr>
<tr>
<td>Interesting things</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Safe park</td>
<td>68%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Physical Activity
Table 2 displays the unadjusted and adjusted odds ratios for meeting physical activity recommendations according to whether participants agreed with each neighborhood variable. When controlling for covariates, those reporting the presence of sidewalks on most streets in their neighborhood were nearly 3 times more likely to meet recommendations. In addition, those reporting unsafe crime levels were approximately half as less likely to meet recommendations and those reporting the presence of a safe park were 2 times more likely to meet recommendations.

Active Commuting
Table 2 also shows the unadjusted and adjusted odds ratios for active commuting based on perceptions of the 11 neighborhood variables. Greater residential density and
having shops and other services within walking distance were both associated with about a 3-fold increase in the odds of walking or biking to work at least once per week. Further, those reporting a safe park in the neighborhood were 2 times more likely to report active commuting.

### Sedentary Behavior

The first 2 columns of Table 3 show the unadjusted and adjusted odds ratios for associations between the 11 neighborhood variables and sedentary behavior. After controlling for the selected covariates, participants who reported the presence of a bus stop within a 10- to 15-minute walk from home, bike facilities in or near their neighborhood, seeing many people being active in the neighborhood, having interesting things to look at while walking in their neighborhood, and having a safe park in the neighborhood were significantly less likely to engage in a higher amount of sedentary behavior.

### Body Mass Index

Finally, the latter columns of Table 3 show the unadjusted and adjusted odds ratios for categorization as overweight or obese. In this case, unexpectedly, seeing many people being active in the neighborhood was associated with

**Table 2** Association of Neighborhood Characteristics With Physical Activity and Active Commuting

<table>
<thead>
<tr>
<th>Neighborhood variables</th>
<th>Meets physical activity recommendations</th>
<th>Active commuting at least once per week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted OR (95% CI)</td>
<td>Adjusted OR&lt;sup&gt;b&lt;/sup&gt; (95% CI)</td>
</tr>
<tr>
<td>Residential density</td>
<td>0.80 (0.41–1.57)</td>
<td>0.87 (0.39–1.94)</td>
</tr>
<tr>
<td>Shops</td>
<td>1.19 (0.63–2.24)</td>
<td>1.40 (0.68–2.91)</td>
</tr>
<tr>
<td>Bus stop</td>
<td>0.68 (0.36–1.31)</td>
<td>0.85 (0.40–1.83)</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>1.76 (0.89–3.45)</td>
<td>2.75 (1.22–6.21)*</td>
</tr>
<tr>
<td>Bike facilities</td>
<td>1.18 (0.63–2.20)</td>
<td>1.24 (0.59–2.59)</td>
</tr>
<tr>
<td>Recreation facilities</td>
<td>1.14 (0.59–2.23)</td>
<td>1.20 (0.54–2.63)</td>
</tr>
<tr>
<td>Crime</td>
<td>0.50 (0.30–0.95)*</td>
<td>0.46 (0.20–0.93)*</td>
</tr>
<tr>
<td>Traffic</td>
<td>0.85 (0.42–1.74)</td>
<td>0.79 (0.35–1.82)</td>
</tr>
<tr>
<td>See people active</td>
<td>0.77 (0.39–1.51)</td>
<td>0.85 (0.39–1.83)</td>
</tr>
<tr>
<td>Interesting things</td>
<td>0.81 (0.43–1.53)</td>
<td>0.99 (0.48–2.02)</td>
</tr>
<tr>
<td>Safe park</td>
<td>2.14 (1.33–3.56)*</td>
<td>2.38 (1.64–3.99)*</td>
</tr>
</tbody>
</table>

<sup>*</sup> P < .05.

<sup>a</sup> For all analyses, the referent group is participants who disagreed with each neighborhood item.

<sup>b</sup> Adjusted by gender, age, education level, children in household, and community of residence.

**Table 3** Association of Neighborhood Characteristics With Sedentary Behavior and Body Mass Index

<table>
<thead>
<tr>
<th>Neighborhood variables</th>
<th>More sedentary behavior</th>
<th>Overweight/obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted OR (95% CI)</td>
<td>Adjusted OR&lt;sup&gt;b&lt;/sup&gt; (95% CI)</td>
</tr>
<tr>
<td>Residential density</td>
<td>0.93 (0.47–1.87)</td>
<td>0.93 (0.40–2.20)</td>
</tr>
<tr>
<td>Shops</td>
<td>0.69 (0.36–1.33)</td>
<td>0.52 (0.24–1.12)</td>
</tr>
<tr>
<td>Bus stop</td>
<td>0.30 (0.15–0.60)*</td>
<td>0.27 (0.12–0.64)*</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>1.04 (0.52–2.08)</td>
<td>1.13 (0.51–2.48)</td>
</tr>
<tr>
<td>Bike facilities</td>
<td>0.48 (0.24–0.93)*</td>
<td>0.33 (0.15–0.74)*</td>
</tr>
<tr>
<td>Recreation facilities</td>
<td>0.93 (0.47–1.84)</td>
<td>0.80 (0.35–1.84)</td>
</tr>
<tr>
<td>Crime</td>
<td>1.24 (0.61–2.54)</td>
<td>1.76 (0.73–4.22)</td>
</tr>
<tr>
<td>Traffic</td>
<td>1.34 (0.64–2.82)</td>
<td>2.03 (0.84–4.93)</td>
</tr>
<tr>
<td>See people active</td>
<td>0.49 (0.24–1.01)</td>
<td>0.42 (0.18–0.98)*</td>
</tr>
<tr>
<td>Interesting things</td>
<td>0.37 (0.19–0.72)</td>
<td>0.33 (0.16–0.70)*</td>
</tr>
<tr>
<td>Safe park</td>
<td>0.69 (0.37–0.96)*</td>
<td>0.64 (0.35–0.94)*</td>
</tr>
</tbody>
</table>

<sup>*</sup> P < .05.

<sup>a</sup> For all analyses, the referent group is participants who disagreed with each neighborhood item.

<sup>b</sup> Adjusted by gender, age, education level, children in household, and community of residence.
an increased likelihood of being overweight/obese. No other neighborhood variables were significantly related to weight status among our sample of participants.

Discussion

This study aimed to identify built environment factors associated with 4 outcomes that may facilitate improved health status and quality of life among Hispanic Americans. Our first set of analyses revealed that several factors in the built and social environment were associated with increased physical activity participation. For instance, having sidewalks on most streets and perceiving the presence of a safe park in the neighborhood both more than doubled the odds of a participant achieving recommended physical activity levels. Some previous studies have likewise reported a positive relationship between sidewalk availability and active recreation and transportation, but some research has suggested that the condition of sidewalks is worse in high-minority areas. Thus, this may be a particularly important, but tenuously available, environmental element for promoting physical activity in Hispanic neighborhoods.

With respect to parks, a growing body of evidence suggests that increased proximity to quality open space has a positive influence on physical activity among persons of all ages. However, numerous studies have documented that high-minority areas frequently have lesser access to quality parks. Moreover, other research found that Hispanics and non-Hispanic Blacks were more likely than Whites to report personal safety concerns or inadequate or poorly maintained facilities as barriers to park use. Similarly, our study found that perceiving one’s neighborhood as unsafe from crime was associated with a substantial reduction in the likelihood of meeting physical activity recommendations. Some research has found that Hispanics report lower neighborhood safety than other race/ethnicity groups, so reducing real and perceived levels of crime may have an especially positive effect on Hispanic health behaviors.

Several environmental variables were also related to increased odds of active commuting to work at least once per week. These included increased residential density and having shops and services nearby. Persons living in more dense neighborhoods have frequently been found to be more active for transport purposes. For Hispanics, denser neighborhoods may facilitate increased social interactions with neighbors and more activity on local streets, both of which may improve perceptions of community connectedness and safety, especially in more ethnically homogeneous areas. More dense neighborhoods also reduce the distance one must travel to work, a consistent correlate of active commuting, and this may be particularly helpful for populations with lesser access to motor vehicles. The availability of shops and services nearby was also associated with active commuting in our sample. This feature, often referred to as mixed land-use, has frequently been associated with overall walking for transportation. The ability to easily conduct errands on the way to or from work may be an enticement to travel by nonmotorized means. Likewise, the presence of shops and other businesses may create a vibrant community that promotes feelings of safety and a willingness to walk or bike to work more frequently. Finally, having a safe park was also related to increased odds of active commuting. One review reported that several studies found a positive association between proximity to parks and residents’ levels of walking or biking for transportation. It may be that safe and well-maintained parks facilitate an environment that is pleasant for neighborhood physical activity, including perhaps active travel to work or school.

We also found that the odds of engaging in a greater amount of sedentary behavior were reduced when participants’ neighborhoods contained a bus stop, bike facilities, numerous people being active, a variety of interesting things to look at, and a safe park. Many of these neighborhood elements have been found to be related to increased active and reduced sedentary behaviors among more general populations. Finally, with respect to weight status, seeing people being active in the neighborhood was related to increased odds of being classified as overweight or obese. No other environmental variables were associated with either a lesser or greater chance of having a higher BMI. More research is needed to explain the 1 counterintuitive finding observed, but it may simply be that neighborhood elements facilitating physical activity are less influential for obesity among Hispanic Americans given the variety of biological, sociodemographic, economic, and cultural factors that can influence health patterns and status within minority populations. Moreover, our study did not examine environmental influences on dietary intake that may affect obesity, but some research shows that healthy food outlets are less prevalent and unhealthy food options are more prevalent in high-minority areas. Anecdotally, this appeared to be true in the study communities as well.

Study Strengths and Limitations

One of the main strengths of this study is our examination of the influence of the built environment among an exclusively minority subpopulation, including both English- and Spanish-speaking Hispanics. Moreover, using well-tested measures, we assessed Hispanic adults’ perceptions of multiple aspects of their neighborhoods and the relationship of these to not only physical activity, but 3 other behaviors and outcomes which have strong associations with numerous chronic diseases.

That said, our findings should be interpreted in light of certain limitations. For example, the associations described herein are cross-sectional and cannot be considered causal. Several authors have begun to assert causality in the relationship between the built environment and physical activity, but more longitudinal and experimental studies are needed to provide stronger evidence of the link between neighborhood design changes and subsequent behaviors among Hispanic Americans.
Our study may also be limited in that we relied on residents’ perceptions, rather than objective measurements, to ascertain ratings of neighborhood attributes. A latent debate exists in the built environment literature as to the relative merits of subjective versus objective measures, but perceptions may be the preferred indicators of certain concepts (eg, safety, aesthetic appeal), while objective measures may be more useful for other attributes (eg, proximity to stores, presence of sidewalks). Moreover, for certain individuals, including perhaps immigrants and those from culturally diverse backgrounds, the veracity of survey information may be compromised if addresses or other identifying data are collected. Further, perceptions of the environment may be especially important to examine among immigrant populations or those who are newer to the community. We also did not directly examine the effect of the number of vehicles in the household, except as a control variable, given that our emphasis was on neighborhood-level influences. Other authors may wish to do so, especially among populations that may have lesser access to motorized transportation.

Finally, our data were derived from a convenience sample of Hispanic residents in the three communities and may not be representative of the broader Hispanic adult population. Many—but unfortunately not all—of the community partners who distributed surveys tracked refusals during the data collection process. Most who did reported that the acceptance and completion rates were very high, but we cannot calculate an official response rate based on the incomplete information they provided. Although enumerating a minority subpopulation can be challenging, future studies should replicate our analyses among a statistically representative sample of Hispanic Americans, if possible. In addition, future authors may wish to examine the modifying role of sociodemographic or cultural factors. For example, our analyses (not shown) found that the influence of these neighborhood variables on meeting physical activity recommendations was similar for overweight/obese compared with healthy weight Hispanic adults, but future research could examine additional moderators such as gender, age, or acculturation.

**Conclusion**

Our findings indicate that several environmental variables are significantly associated with physical activity and other health behaviors and outcomes among Hispanic adults. In doing so, we showed that neighborhood elements contributing to active living apply to specific minority populations as well, a limitation of past research. Future research should use diverse methodologies (eg, qualitative, longitudinal) to explore the unique ways these factors may influence physical activity among Hispanics. As well, more studies should explicitly consider the role of race/ethnicity as a moderator of such relationships. In general, further investigation of the built environment’s role in health issues among Hispanics will provide evidence for neighborhood designs that can support physical activity and ultimately improve the health of Hispanic communities.

**References**


