Perceived Neighborhood Factors, Health Behaviors, and Related Outcomes in the Hispanic Community Health Study/Study of Latinos

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Abstract

Hispanic/Latino populations may experience significant neighborhood disadvantage, but limited research has explored whether these factors affect their health behaviors. Associations between perceived neighborhood factors at Visit 1 and health behaviors and related outcomes at Visit 2 in the Hispanic Community Health Study/Study of Latinos were evaluated. Multivariable logistic regression assessed cross-sectional and longitudinal relationships between perceived neighborhood social cohesion (NSC, 5 items), and neighborhood problems (NP, 7 items), with cancer screening, current smoking, excessive/binge drinking, hypertension, obesity, physical activity, and poor diet by gender and birthplace. NSC and NP scores were converted into quartiles. Mean age of participants was 42.5 years and 62.1% were women. Perceived NP, but not perceived NSC, differed by gender (p<.001). In unstratified models, no significant associations were observed between perceived NSC and any health behavior, whereas greater perceived NP was associated with less adherence to colon cancer screening (moderate level: aOR=0.68, 95% CI=0.51, 090) and more physical activity (very high level: aOR=1.34, 95% CI=1.06, 1.69) compared to low perceived NP. Women with moderate perceived NP, versus low NP, had a lower odds of colon cancer screening at Visit 1 (aOR=0.62, 95% CI=0.43, 0.91) and higher odds of mammogram adherence at Visit 2 (aOR=2.86, 95% CI=1.44, 5.68). Men with high perceived NP had a higher odds of excessive or binge drinking at Visit 2 (aOR=1.99, 95% CI=1.19, 3.31). We conclude that perceived NP were significantly related to health behaviors among HCHS/SOL individuals. Perceptions of neighborhood environment may be considered modifiable factors of structural neighborhood environment interventions.

Keywords

Neighborhood Characteristics; Health Risk Behaviors; Early Detection of Cancer; Hispanic or Latino

Introduction

Neighborhood environment, as a structural social determinant of health, is often considered to be a possible avenue to not only improve population health but also to reduce health disparities (Diez Roux 2016). Populations with health disparities may experience significant disadvantage in health-related outcomes associated with neighborhood factors, including tobacco use, mental health care, and incident cardiovascular disease (Kershaw, Diez Roux et al. 2015, Cook, Zuvekas et al. 2017, Ribisl, D'Angelo et al. 2017). As the largest racial/ethnic minority group in the U.S., Hispanic/Latino individuals experience more socioeconomic disadvantage as well as reduced access to preventive health services compared to the general U.S. population (Velasco-Mondragon, Jimenez et al. 2016, Williams, Lu et al. 2017).

The neighborhood environment is an important determinant to evaluate when investigating health disparities, especially as social position and ethnicity are often linked to people's place of residence (Roux and Mair 2010). Prior studies have shown that Hispanic/Latino populations report lower neighborhood social cohesion and live in neighborhoods with worse social environments compared to African American or White populations (Mujahid,

Diez Roux et al. 2008, Mujahid, Diez Roux et al. 2008). Neighborhoods with worse social environments may contribute to the variability seen in the prevalence of health behaviors across Hispanic/Latino populations, including cancer screening (Gorin and Heck 2005), physical activity (Neighbors, Marquez et al. 2008), smoking (Kaplan, Bangdiwala et al. 2014), and alcohol use (Rios-Bedoya and Freile-Salinas 2014). It is possible that certain aspects of neighborhood environment may confer health benefits or risks on Hispanic/Latino individuals.

Hispanic/Latino populations have a lower mortality (Ruiz, Steffen et al. 2013) and longer life expectancy (GBD US Health Disparities Collaborators 2022) when compared to White populations with similar or better health outcomes despite being more disadvantaged and with less access to health services. This observation is partially explained by the proportion of immigrants, but all factors are not understood. Given that Hispanic/Latino populations constituted 18.9% of the U.S. population in 2020 (Jones, Marks et al. 2021), and there remains a lack of research that evaluates the relationship between specific neighborhood factors and health behaviors, there is motivation to study this gap in the literature and understand if neighborhood environment influences health behavior among Hispanic/Latino individuals.

Neighborhood environment may be evaluated by measures at the population-level using census tract medians for poverty level, observational data at the street level from structured review of areas noting broken windows and observed garbage within a neighborhood for example, or by perceived measures from individual residents that reflect on neighborhood characteristics, such as neighborhood social cohesion (NSC) or neighborhood problems (NP). Although all types of measures are valuable and complement each other, the exact relationship between population-level and perceived measures has not been fully elucidated. Perceived measures may operate as potential mediators between population-level measures and health and have also been associated with individual physical health and health behavior while other types have been correlated with population-level metrics.

NSC is the degree of connectedness between and among neighbors and their willingness to intervene for the common good and incorporates feelings of trust and shared values among neighbors (McNeill, Kreuter et al. 2006). NSC may influence health by promoting the common adoption of, or reinforcing, health promoting behaviors such as more physical activity, increasing the ability of a neighborhood to advocate for its health needs, and through psychosocial mechanisms such as an increase in social support (Kawachi and Berkman 2000). Previous research has shown associations between NSC and decreased mortality and cardiovascular disease as well as improved self-rated health, with some observed differences by gender (Lochner, Kawachi et al. 2003, Poortinga, Dunstan et al. 2007, Bjornstrom, Ralston et al. 2013, Kim, Hawes et al. 2014). Higher levels of NSC have also been linked with improved health behaviors, such as increased physical activity and greater use of preventive health care services (Fisher, Li et al. 2004, Kim and Kawachi 2017). In contrast, NP has been less consistently defined as a perceived construct and usually includes physical or built aspects related to excess traffic, litter, poor sidewalk maintenance and/or social disorder factors such as crime. It has been hypothesized that increased NP is associated with greater health risk factors and fewer preventive services.

While methods and findings have been inconsistent, NP has been linked with health behaviors and outcomes such as increased smoking and alcohol use as well as worse mental health (Latkin and Curry 2003, Echeverria, Diez-Roux et al. 2008).

In general, the neighborhood environment may have a differential impact on the health of women compared to men. Women have been observed to have a higher odds of less than good self-reported health if they experience low integration, low or moderate trust, low tolerance, and low quality of physical environment (Stafford, Cummins et al. 2005). Not being in good health has also been associated with self-reported community problems among women (Molinari, Ahern et al. 1998). These gender differences may be partially due to the influence of neighborhood environment on health behavior. However, the gender-specific impact of neighborhood environment on health behavior has been understudied.

Research on neighborhood environment and the health of Hispanic/Latino populations is needed but has been limited by the availability of data to characterize both neighborhood factors and health outcomes among diverse heritages. Our goal was to identify perceived neighborhood factors which influence health behaviors in this population. Such research stands in contrast to most research among Hispanic/Latino individuals, which have been dominated by one heritage. We used cross-sectional and longitudinal data from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) to examine how perceived NSC and NP were related to health promoting and risk factors across four communities.

Methods

The HCHS/SOL is a prospective cohort study of 16,415 men and women, aged 18–74, from randomly selected households recruited from four U.S. field centers with a high-density of Hispanic/Latino populations—Bronx, NY; Chicago, IL; Miami, FL; and San Diego, CA. The detailed methodology was published elsewhere (Lavange, Kalsbeek et al. 2010, Sorlie, Aviles-Santa et al. 2010). Briefly, HCHS/SOL used a stratified two-stage area probability sample design with household addresses sampled near each field center. Participants who self-identified as Hispanic/Latino, were living in the selected household, able to attend a clinic visit, and not planning to move within 6 months were considered eligible. The baseline visit (Visit 1) was conducted between 2008–2011 with yearly telephone follow-up assessments and a follow-up visit (Visit 2) completed between 2014–2017. Current analyses were restricted to a representative sample of Visit 1 individuals (n=5,313) who participated in the Sociocultural Ancillary Study (SCAS), which was initiated to investigate sociocultural and psychosocial factors and involved a 1–2 hour visit within 9 months of the baseline visit, with 72% having completed the visit within 4 months (Gallo, Penedo et al. 2014). Informed consent was obtained for all individuals with IRB approval. For this analysis, IRB review was not required since only deidentified data were used (Code of Federal Regulations, Title 45, Part 46).

Demographic Characteristics

Demographic characteristics, all assessed at Visit 1, included age, gender, education level (less than high school, high school graduate or equivalent, more than high school), household income (less than $30,000 or $30,000 or more), health insurance (insured

or uninsured), birthplace (U.S. state/territory-born or foreign-born), heritage (Central American, Cuban, Dominican, Mexican, Puerto Rican, South American, more than one heritage), field center, years lived in the U.S. (among foreign-born individuals only), and years lived in neighborhood.

Neighborhood Measures

Neighborhood environment was evaluated at the SCAS Visit using scores for perceived neighborhood social cohesion (NSC) and perceived neighborhood problems (NP). Both measures have been previously found to have high reliability among HCHS/SOL individuals and in another study (Echeverria, Diez-Roux et al. 2004, Mujahid, Diez Roux et al. 2007, McCurley, Gutierrez et al. 2019, Estrella, Durazo-Arvizu et al. 2020). Perceived NSC was derived from responses to five items which asked participants to rate how much they agree with the following statements: *This is a close-knit neighborhood; People around here are willing to help their neighbors; People in this neighborhood generally don't get along with each other; People in this neighborhood can be trusted;* and *People in this neighborhood do not share the same values.* Standardized Cronbach's alpha for neighborhood social cohesion was 0.703. Items were summed and their total score (range: 5–25) was categorized as very low, moderate, high, or very high quartiles.

Perceived NP was derived by assessing how much participants viewed the following seven specific problems in their neighborhood: *Excessive noise; Heavy traffic or speeding cars; Lack of access to adequate food shopping; Lack of parks or playgrounds; Trash and litter; No sidewalks or poorly maintained sidewalks;* and *Violence.* Standardized Cronbach's alpha for neighborhood problems was 0.774. Items were summed and their total score (range: 4–28) was categorized in quartiles as low, moderate, high, and very high levels.

Health Behaviors and Related Outcomes

Health behaviors were categorized as promoting factors or risk factors at Visit 1 and Visit 2. Health promoting factors included cancer screening behaviors and physical activity. Cancer screening behaviors were evaluated by adherence to U.S. Preventative Services Task Force guidelines for colorectal cancer screening among men and women ages 50–74, mammograms every two years among women ages 50–74, and pap smears among women every three years over age 21 (U.S. Preventive Services Task Force). Prostate cancer screening adherence was defined as screening among men, ages 55–69, within the past five years (Carter, Albertsen et al. 2013). Individuals were considered physically active if they had at least 150 minutes per week of moderate activity, at least 75 minutes per week of vigorous activity, or a combination of the two based on Global Physical Activity Questionnaire (GPAQ) responses.

Health risk factors included current cigarette smoking, excessive or binge alcohol drinking, having hypertension, obesity, and poor diet quality. Current smoking was defined as having ever smoked at least 100 cigarettes and now smoking every day or some days. Excessive drinking was defined as (a) >14 drinks per week on average for men <65 years or (b) >7 drinks per week on average for all women and men 65 years (National Institute on Alcohol Abuse and Alcoholism (NIAAA)). Binge drinking was defined as (a) women who

reported drinking 4 drinks or (b) men who reported drinking 5 drinks within a 2-hour period at least once a month (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015). Hypertension was defined as a systolic or diastolic blood pressure >140/90 mm Hg or taking antihypertensive medications. Obesity was defined as a body mass index 30 kg/m^3. Poor diet quality was defined as an Alternative Healthy Eating Index score below the 25th percentile and was assessed using a 24-hour dietary recall. The following health behaviors were available at both visits: colorectal cancer screening, mammogram, pap smear, prostate cancer screening, current smoking, excessive or binge drinking, hypertension, and obesity. Physical activity and diet quality were only available at Visit 1.

Statistical Analysis

The reference group for perceived NSC was set as the highest quartile, such that each decreasing quartile from high to moderate to low perceived NSC was reflective of a hypothesized greater neighborhood disadvantage. For perceived NP, the lowest quartile was set as the reference group, such that each increasing quartile from moderate to high to very high perceived NP was reflective of a hypothesized greater neighborhood disadvantage. Analyses assessed relationships between neighborhood factors at the SCAS Visit and health behaviors at Visit 1 as well as longitudinal relationships between neighborhood factors at the SCAS Visit and future health behaviors at Visit 2.

Descriptive data were age-standardized to the 2010 U.S. population, survey data analysis procedures were used to account for the complex sampling, and all data analyses were weighted. The complex survey design of HCHS/SOL accounted for loss to follow-up and missing data between visits. Analyses accounted for non-response at Visit 2 by including adjusted sampling weights. To adjust the sampling weights, HCHS/SOL first identified factors related to not attending Visit 2 by using a regression tree approach. Those factors were then used to form finer strata and adjusted weights within each stratum were calculated. By using the adjusted sampling weights, the survey methodology accounted for loss to follow-up and missing data. Main analyses were stratified by gender (Tables 1–4). Additional analyses were also conducted in the non-stratified sample (Supplemental Tables A–B) as well as by birthplace (Supplemental Tables C–F) and field center (Data not presented). The percentage of missing data was 0.34% to 1.25% for any one outcome with no evidence of differential missing data.

Multivariable logistic regression was used to model the relationship between perceived NSC quartiles or perceived NP quartiles and adherence to the four cancer screening tests, physical activity guideline adherence, current smoking, excessive or binge drinking, hypertension, obesity, and poor diet. Bivariate models were fit prior to the construction of all final models. Models included participants with non-missing data for variables related to demographic characteristics, neighborhood factors, and health behaviors. P-values were adjusted for multiple comparisons using the Bonferroni correction. Covariates included age, gender (in models not stratified by gender), education level, household income, health insurance, field center, years lived in the U.S., years lived in neighborhood, and the corresponding health

behavior at Visit 1 (in longitudinal models only). Analyses were conducted using SAS, Version 9.4 (SAS Institute, Inc., Cary, North Carolina).

Results

Demographic characteristics are shown in Table 1, with an overall mean age of 42.5 years and a greater proportion of women (62.1%). A slightly greater proportion of women than men had a greater than high school or equivalent education level (41.1% versus 37.6%, p<.001), although a larger proportion of men than women reported a household income of $30,000 or more (33.7% versus 25.7%, p<.001). Almost half of both men and women did not have any health insurance (48.7% and 47.0%, p=0.029) and majorities of both were foreign-born (67.3% and 70.6%, respectively, p=0.011). Larger proportions of women compared to men were Dominican (13.1% versus 9.8%) and Mexican (37.0% versus 34.8%) and a higher proportion of men than women were Cuban (23.6% versus 18.5%). The proportions of men and women differed slightly across field centers (Table 1). Men had lived more years in the U.S. than women (22.0 years versus 19.9 years, p=0.002).

Neighborhood Factors and Health Behaviors by Gender

Men had a higher score for perceived NP, but perceived NSC did not differ by gender (Table 2). A slightly larger proportion of men were categorized into high or very high levels of perceived NP compared to women (59.4% versus 53.9%, p<.001). Overall, all health risk behaviors, except hypertension, varied by gender. Men were more likely to report excessive or binge drinking and smoking, but a higher proportion women had obesity and reported poor diet quality at one or more visits. Among health protective behaviors, women had a lower prevalence of meeting physical activity guidelines (56.9% versus 72.9%, p<.001). Among the interaction terms that were constructed between the perceived NP or perceived NSC and gender, and assessed in adjusted models, none were observed to be statistically significant.

Perceived Neighborhood Problems and Health Behaviors by Gender

Gender-stratified relationships between perceived NP and health promoting and risk behaviors, adjusted for covariates, are presented in Table 3. Compared to participants with low perceived NP, women with moderate perceived NP were less likely to be adherent to colon cancer screening guidelines at Visit 1 (aOR=0.62, 95% CI=0.43, 0.91, p=0.049). Women who experienced moderate perceived NP were more likely to report mammogram adherence at Visit 2 (aOR=2.86, 95% CI=1.44, 5.68, p=0.008) (Data not shown). Compared to men with low perceived NP, men who reported high perceived NP had almost double the odds of excessive or binge drinking (aOR=1.99, 95% CI=1.19, 3.31, p=0.03) at Visit 2. No statistically significant relationships were observed between perceived NP and pap smear screening, physical activity level, current smoking, hypertension, obesity, and poor diet quality among either men or women (Some data not shown).

In unstratified adjusted models, results showed that participants with moderate levels of perceived NP were less likely to report colon cancer (adjusted odds ratio [aOR]=0.68, 95% confidence interval [CI]=0.51, 0.90, p=0.02) at Visit 1 compared to participants with low

perceived NP (Supplemental Table A). Participants with very high levels of perceived NP were more likely to be physically active (aOR=1.34, 95% CI=1.06, 1.69, *p*=0.04).

Perceived Neighborhood Social Cohesion and Health Behaviors by Gender

In gender-stratified models, no statistically significant relationships were observed between perceived NSC and any of the ten health behaviors evaluated at Visit 1 or Visit 2 (Table 4 or Data not shown). In unstratified adjusted models, no significant associations were observed between perceived NSC and any of the ten health behaviors evaluated at Visit 1 (Supplemental Table B or Data not shown).

Perceived Neighborhood Problems and Health Behaviors by Birthplace

Foreign-born participants were older (Supplemental Table C) and had similar average perceived NSC total score but significantly lower average perceived NP total score (Supplemental Table D). Among U.S.-born participants, moderate and high perceived NP were associated with less prostate cancer screening (aOR=0.17, 95% CI=0.04, 0.67, *p*=0.04 and aOR=0.20, 95% CI=0.05, 0.73, *p*=0.046, respectively) (Supplemental Table E). Among foreign-born participants, moderate perceived NP was associated with current smoking (aOR=1.65, 95% CI=1.10, 2.47, *p*=0.048). No significant associations were observed between perceived NSC and any of the ten health behaviors (Supplemental Table F).

Discussion

This is the first study to evaluate perceived neighborhood factors and health promoting and risk behaviors in a large sample of Hispanic/Latino individuals from multiple heritages. We found that participants who had elevated perceived NP had a decreased likelihood of colon cancer screening adherence, especially among women. Additionally, elevated perceived NP increased the likelihood of excessive or binge drinking among men. These findings are consistent with previous literature (Latkin and Curry 2003, Fisher, Li et al. 2004, Echeverria, Diez-Roux et al. 2008, Kim and Kawachi 2017) linking disadvantaged neighborhood environment with poorer health behaviors and outcomes such as cancer screening. The results emphasize the importance of improving the quality of the built environment in developing interventions to promote health equity (Diez Roux and Mair 2010, Gomez, Shariff-Marco et al. 2015, Rollings, Wells et al. 2015, Besser, McDonald et al. 2017). We also found limited evidence that perceived NP may have a potential negative influence on the observed health advantage of Hispanic/Latino populations (Cagney, Browning et al. 2007, Bjornstrom and Kuhl 2014, Pruitt, Tiro et al. 2016).

Paradoxical results showed some evidence that perceived NP significantly contributed to mammogram adherence among women and more physical activity among all individuals. These factors have been studied within the context of neighborhood environments (Myers, Denstel et al. 2016, Yi, Trinh-Shevrin et al. 2016, Kim and Kawachi 2017, Mooney, Joshi et al. 2017), including among Hispanics/Latinos (Silfee, Rosal et al. 2016, Jauregui, Salvo et al. 2017), and generally observed results opposite to those in this study. These unexpected results may be due to unmeasured factors that facilitated screening mammograms and physical activity across the study sites.

Nevertheless, our results linking neighborhood problems and health behaviors among a diverse Hispanic/Latino sample are novel. The findings related to perceived NP build upon existing evidence which suggests that disadvantaged neighborhood environment contributes to health disparities among Hispanic/Latino populations, such as subclinical atherosclerosis as well as poor sleep duration and efficiency (Wing, August et al. 2016, Simonelli, Dudley et al. 2017). Our findings provide further insight into the role of perceived NP and how these may influence health behaviors. We showed that high levels of perceived NP were longitudinally related to almost a doubling of the odds of excessive or binge drinking among men compared to participants with low perceived NP. Addressing the factors that lead to neighborhood problems is imperative and would provide the opportunity to reduce existing health disparities through structural interventions to influence health risk behaviors. Though Hispanic/Latino individuals on average smoke less, drink less, and have a similar prevalence of hypertension compared to White individuals, our results showed that these health risk factors may be susceptible to the influence of neighborhood problems.

Some researchers suggest that Hispanic/Latino immigrants may benefit from a protective immigrant health advantage even though they experience significant health disparities (Franzini, Ribble et al. 2001, Akresh, Do et al. 2016, Pruitt, Tiro et al. 2016). No previous studies have examined how differences in perceived neighborhood environment may influence health behaviors in this population. Our findings suggest that perceived NP may have unique and diverging impacts on the health behaviors of foreign-born Hispanic/Latino individuals given that we observed an increased odds of current smoking in this group. Recent data show that most Hispanic/Latino populations immigrate to the U.S. from countries where national smoking prevalence is lower compared to the U.S. It is possible that changes in neighborhood environment could contribute to increased susceptibility to smoking (Constantine, Adejoro et al. 2013) in addition to targeted tobacco marketing efforts in disadvantaged neighborhoods (Lee, Henriksen et al. 2015).

In contrast, we found that U.S.-born Hispanic/Latino individuals with greater perceived NP were approximately 80% less likely to be adherent to prostate cancer guidelines. These results suggest that perceived NP could be a potential barrier to cancer screening among U.S.-born Hispanic/Latino populations specifically, as opposed to a pathway that contributes to greater health risk behaviors as was observed among foreign-born participants. Because our analyses controlled for health insurance, income, and education, the differences observed were unlikely due to health care access. Overall, the diverging trends in health risk versus health promoting behaviors by birthplace among Hispanic/Latino individuals constitute a distinction that could affect both public health interventions and clinical practice addressing the health needs of these populations. For example, immigrants with greater perceived NP may benefit specifically from counseling or interventions focused on decreasing health risk behaviors, while U.S.-born Hispanic/Latino populations may benefit from interventions focused on facilitating the obtainment of recommended preventive services.

Overall, our study focused on the relationship between neighborhood perception measures and health behaviors. Perceived measures may be most appropriate to examine through the psychosocial model of disadvantage, where disorder must first be experienced to

cause stress and affect outcomes (O'Brien, Farrell et al. 2019). Through this lens, it is possible our findings of perceived NP and reduced health promoting behaviors are consequences of mental health problems. Furthermore, the relationship between population-level and individual-level measures are complex. Some studies have found perceived measures to be heavily influenced by neighborhood characteristics, such as neighborhood racial composition (Sampson and Raudenbush 2004) or neighborhood poverty (Franzini, Caughy et al. 2008) while others have found that the relationship between population-level measures and health are mediated through individual-level perception of neighborhood quality (Weden, Carpiano et al. 2008). There is a need for additional research that can examine both modalities simultaneously to further elucidate these relationships.

Our study was limited by having data from only four urban communities, which were over-represented by immigrants and urban residents. It was also limited by the lack of population measures of neighborhoods or direct observations of neighborhoods. Therefore, we were not able to assess the influence of neighborhood perceptions separately from more objective neighborhood characteristics. For cross-sectional analyses, the exposure of interest was assessed up to 9 months after the outcomes of interests, but 72.6% of individuals had completed the assessment within 4 months. Thus, it is unlikely that neighborhood perceptions would change in this time interval given that cancer screening behaviors are based on a minimum of 2-year intervals, and the impact of changes in other health behaviors on overall results would be limited given their sample size. The potential for unmeasured confounders also existed, although we probably captured at least part of the influence of such confounders through the covariates that were included.

Conclusion

In summary, greater levels perceived neighborhood problems were significantly associated with lower adherence with colon cancer screening, particularly among women, and more excessive or binge drinking among men. We also found significant differences in how perceived neighborhood problems influenced health behaviors by birthplace, suggesting an important pathway in how perceived neighborhood environment affects health disparities among immigrants. A significant strength of this study is that the data are from a large longitudinal, community-based study of diverse Hispanic/Latino populations in the U.S. These results may be applicable to Hispanic/Latino urban communities and remain pertinent in the context of chronic disease prevention, risk factor management, and public health interventions. Our findings can inform community-level efforts targeted at reducing health disparities and promoting health equity and may contribute to tailoring preventative health interventions and contextualize health maintenance counseling based on the neighborhood context of patients and communities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments:

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Highlights

- The impact of neighborhood factors on health behavior among Latinos were evaluated

- Health behaviors among women and men were impacted by greater neighborhood problems

- Similar impacts by greater neighborhood problems were observed by birthplace

Table 1.

Age-standardized Demographic Characteristics, Neighborhood Factors, and Health Behaviors by Gender: Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study, 2008–2011 (n = 5,313)

Characteristics	P	Total (n = 5,313) Mean (SE) or %	Men (n = 2,014) Mean (SE) or %	Women (n = 3,299) Mean (SE) or %
Age, mean (SE)	**<.001**	42.5 (0.38)	41.7 (0.51)	43.2 (0.49)
Age, categorical	**<.001**			
18–29		23.2	25.9	21.0
30–39		20.0	19.7	20.2
40–49		23.4	22.2	24.3
50–59		17.7	16.8	18.5
60–69		12.1	11.9	12.3
70–74		3.6	3.5	3.6
Education	**<.001**			
Less than high school		33.1	32.3	33.7
High school graduate or equivalent		27.6	30.2	25.2
Greater than high school or equivalent		39.4	37.6	41.1
Household income	**<.001**	70.6	66.3	74.3
Less than $30,000		70.6	66.3	74.3
$30,000 or more		29.4	33.7	25.7
Health insurance	**0.029**			
Insured		53.0	51.3	53.0
Non-insured		47.0	48.7	47.0
Birthplace	**0.011**			
Foreign-born		69.1	67.3	70.6
U.S.-born		30.9	32.7	29.4
National heritage	**<.001**			
Central American		7.5	7.3	7.7
Cuban		20.7	23.6	18.5
Dominican		11.6	9.8	13.1
Mexican		36.1	34.8	37.0
Puerto Rican		16.0	16.8	15.4
South American		4.8	5.0	4.6
More than 1 heritage		3.3	2.8	3.7
Field center	**0.013**			
Bronx, NY		30.2	28.1	31.9
Chicago, IL		15.5	15.9	15.3
Miami, FL		29.6	31.3	28.1
San Diego, CA		24.8	24.7	24.7
Years lived in the U.S., mean (SE)	**0.002**	20.8 (0.53)	22.0 (0.62)	19.9 (0.60)
Years in neighborhood, mean (SE)	0.747	7.8 (0.27)	7.9 (0.30)	7.7 (0.34)

Note. SE = standard error; Bold font denotes statistical significance

Table 2

Health Study/Study of Latinos Sociocultural Ancillary Study, 2008–2011 and 2014–2017 (**n** = 5,313)

Characteristics		*P*	Total (*n* = 5,313) Mean (SE) or %	Men (*n* = 2,014) Mean (SE) or %	Women (*n* = 3,299) Mean (SE) or %
Neighborhood factors					
Perceived neighborhood social cohesion (NSC)[a]					
Low		0.805	22.5	22.4	22.8
Moderate			22.6	22.1	23.0
High			24.3	24.5	24.0
Very high			30.6	31.0	30.2
Total score, mean (SE)		0.786	15.8 (0.07)	15.8 (0.10)	15.7 (0.09)
Perceived neighborhood problems (NP)[a]					
Low		**<.001**	24.2	23.0	25.1
Moderate			19.5	17.6	21.0
High			24.8	26.4	23.6
Very high			31.6	33.0	30.3
Total score, mean (SE)		0.067	12.0 (0.11)	12.1 (0.13)	11.8 (0.14)
Health protective behaviors					
Colon cancer screening [b]	Visit 1	0.520	55.3	53.4	56.7
	Visit 2	0.133	55.0	51.7	57.4
Mammogram [b]	Visit 1	–	76.5	–	76.5
	Visit 2	–	78.0	–	78.0
Pap smear [b]	Visit 1	–	74.8	–	74.8
	Visit 2	–	68.7	–	68.7
Prostate cancer screening [c]	Visit 1	–	54.6	54.6	–
	Visit 2	–	62.3	62.3	–
Physically active [d]	Visit 1	**<.001**	64.1	72.9	56.9
	Visit 2	–	–	–	–
Health risk behaviors					
Current smoking [e]	Visit 1	**<.001**	20.5	25.7	16.4
	Visit 2	**<.001**	16.7	22.3	12.4
Excessive/binge drinking [f]	Visit 1	**<.001**	40.5	49.7	28.6
	Visit 2	**<.001**	29.2	41.1	18.0
Hypertension [g]	Visit 1	0.396	29.3	30.3	28.5
	Visit 2	0.931	35.2	35.5	34.9
Obesity [h]	Visit 1	**0.008**	41.0	37.9	43.6
	Visit 2	**<.001**	42.0	36.7	46.0
Poor diet quality [i]	Visit 1	**<.001**	22.7	17.4	27.2
	Visit 2	–	–	–	–

Note. SE = standard error; Bold font denotes statistical significance

[a] Range of perceived neighborhood social cohesion: 5–25; Range of perceived neighborhood problems: 7–28

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Table 3

Multivariable Logistic Regression Results between Perceived Neighborhood Problems and Selected Health Behaviors: Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study 2008–2011 and 2014–2017 (n = 5,313)

	Colon cancer screening[a]						Physically active[b]						Current smoking[c]					
	Men			Women			Men			Women			Men			Women		
	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p
Visit 1																		
Low	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
Moderate	0.78	(0.52, 1.18)	0.75	**0.62**	**(0.43, 0.91)**	**0.049**	0.91	(0.60, 1.39)	1.00	1.06	(0.79, 1.43)	1.00	1.42	(0.87, 2.30)	0.45	0.98	(0.60, 1.59)	1.00
High	0.96	(0.62, 1.47)	1.00	0.78	(0.53, 1.15)	0.65	1.25	(0.84, 1.85)	0.84	1.08	(0.80, 1.46)	1.00	1.10	(0.73, 1.67)	1.00	0.73	(0.45, 1.19)	0.63
Very high	0.92	(0.59, 1.43)	1.00	0.76	(0.50, 1.14)	0.53	1.51	(1.05, 2.17)	0.08	1.24	(0.94, 1.65)	0.42	1.65	(1.06, 2.54)	0.07	1.09	(0.71, 1.66)	1.00
Visit 2																		
Low	(ref)			(ref)			–			–			(ref)			(ref)		
Moderate	1.09	(0.58, 2.05)	1.00	0.70	(0.44, 1.13)	0.42	–	–	–	–	–	–	0.78	(0.39, 1.54)	1.00	1.43	(0.72, 2.86)	0.93
High	1.17	(0.74, 1.86)	1.00	0.94	(0.62, 1.41)	1.00	–	–	–	–	–	–	1.07	(0.62, 1.83)	1.00	1.03	(0.53, 2.03)	1.00
Very high	0.81	(0.49, 1.35)	1.00	1.00	(0.67, 1.51)	1.00	–	–	–	–	–	–	1.56	(0.91, 2.68)	1.00	1.84	(0.94, 3.63)	0.23

	Excessive/binge drinking[e]						Hypertension[f]						Obesity[g]					
	Men			Women			Men			Women			Men			Women		
	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p	aOR[d]	95% CI	p
Visit 1																		
Low	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
Moderate	1.26	(0.81, 1.98)	0.93	1.04	(0.57, 1.90)	1.00	1.33	(0.78, 2.26)	0.89	1.21	(0.82, 1.77)	1.00	0.98	(0.66, 1.46)	1.00	1.01	(0.77, 1.33)	1.00
High	1.04	(0.68, 1.60)	1.00	1.20	(0.68, 2.14)	1.00	0.78	(0.53, 1.15)	0.66	1.13	(0.74, 1.72)	1.00	0.88	(0.64, 1.21)	1.00	0.89	(0.65, 1.21)	1.00

	aOR	95% CI	p	aOR	95% CI	p	aOR	95% CI	p	aOR	95% CI	p	aOR	95% CI	p	aOR	95% CI	p
Very high	1.28	(0.85, 1.92)	0.74	1.27	(0.74, 2.17)	1.00	1.08	(0.70, 1.66)	1.00	1.23	(0.86, 1.76)	0.80	0.88	(0.62, 1.24)	1.00	1.12	(0.83, 1.50)	1.00
Visit 2																		
Low	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
Moderate	1.62	(0.91, 2.88)	0.30	0.90	(0.43, 1.91)	1.00	1.27	(0.68, 2.34)	1.00	0.86	(0.58, 1.28)	1.00	0.81	(0.39, 1.69)	1.00	1.33	(0.82, 2.16)	0.73
High	**1.99**	**(1.19, 3.31)**	**0.03**	1.02	(0.49, 2.13)	1.00	1.11	(0.62, 1.99)	1.00	1.16	(0.74, 1.82)	1.00	0.92	(0.55, 1.53)	1.00	0.83	(0.52, 1.35)	1.00
Very high	2.04	(1.11, 3.76)	0.07	0.80	(0.40, 1.60)	1.00	1.48	(0.80, 2.76)	1.00	1.04	(0.66, 1.63)	0.648	0.74	(0.40, 1.36)	1.00	0.70	(0.46, 1.07)	0.31

Note. aOR = Adjusted odds ratio, CI = Confidence interval, ref = Reference category; Bold font denotes statistical significance

[a] Based on 2017 U.S. Preventive Services Task Force guidelines

[b] Based on 150 minutes of moderate activity per week, 75 minutes of vigorous activity per week, or a combination of both

[c] Defined as self-reported smoking of at least 100 cigarettes in lifetime and current daily or someday smoking

[d] Adjusted for age, birthplace, education, household income, health insurance, field center, years lived in the U.S., years lived in neighborhood, and health behavior at Visit 1

[e] Excessive alcohol drinking defined as >14 drinks per week on average for men <65 years old or >7 drinks per week on average f or men ≥65 years old and all women. Binge alcohol drinking defined as women who reported drinking ≥4 drinks or men who reported drinking ≥5 drinks within a 2-hour period at least once a month

[f] Based on systolic or diastolic blood pressure >140/90 or if the participant self-reported as currently taking antihypertensive medications

[g] Based on a body mass index ≥30 kg/m³

Table 4.

Multivariable Logistic Regression Results between Perceived Neighborhood Social Cohesion and Selected Health Behaviors: Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study, 2008–2011 and 2014–2017 ($n = 5,313$)

	Colon cancer screening[a]						Physically active[b]						Current smoking[c]					
	Men			Women			Men			Women			Men			Women		
	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P
Visit 1																		
Very high	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
High	1.19	(0.78, 1.81)	1.00	0.83	(0.60, 1.16)	0.78	0.81	(0.58, 1.12)	0.61	1.00	(0.71, 1.40)	1.00	0.75	(0.53, 1.07)	0.35	0.94	(0.56, 1.58)	1.00
Moderate	0.91	(0.61, 1.36)	1.00	0.80	(0.57, 1.13)	0.57	0.82	(0.57, 1.17)	0.81	1.03	(0.78, 1.35)	1.00	1.21	(0.83, 1.76)	0.99	1.04	(0.73, 1.50)	1.00
Low	1.11	(0.74, 1.64)	1.00	0.97	(0.68, 1.38)	1.00	1.26	(0.87, 1.82)	0.67	0.73	(0.54, 0.98)	0.11	1.13	(0.78, 1.65)	1.00	1.06	(0.67, 1.68)	1.00
Visit 2																		
Very high	(ref)			(ref)			–	–	–	–	–	–	(ref)			(ref)		
High	0.67	(0.41, 1.08)	0.30	1.10	(0.72, 1.67)	1.00							0.79	(0.44, 1.41)	1.00	0.97	(0.53, 1.80)	1.00
Moderate	0.83	(0.51, 1.34)	1.00	1.05	(0.76, 1.44)	1.00							0.62	(0.33, 1.16)	0.40	1.02	(0.56, 1.87)	1.00
Low	1.55	(0.97, 2.49)	0.21	1.30	(0.92, 1.86)	0.43							0.79	(0.45, 1.38)	1.00	1.11	(0.68, 1.83)	1.00

	Excessive/binge drinking[e]						Hypertension[f]						Obesity[g]					
	Men			Women			Men			Women			Men			Women		
	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P	aOR[d]	95% CI	P
Visit 1																		
Very high	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
High	1.23	(0.81, 1.89)	1.00	1.10	(0.67, 1.79)	1.00	0.73	(0.51, 1.06)	0.28	0.98	(0.71, 1.35)	1.00	1.03	(0.72, 1.47)	1.00	0.71	(0.51, 0.99)	0.14
Moderate	1.05	(0.70, 1.58)	1.00	1.16	(0.72, 1.88)	1.00	1.00	(0.69, 1.44)	1.00	0.74	(0.55, 1.01)	0.16	1.13	(0.80, 1.60)	1.00	0.80	(0.61, 1.05)	0.31
Low	1.17	(0.74, 1.85)	1.00	1.74	(1.06, 2.87)	0.08	0.87	(0.58, 1.31)	1.00	1.25	(0.95, 1.66)	0.35	0.89	(0.64, 1.26)	1.00	0.80	(0.61, 1.06)	0.35
Visit 2																		
Very high	(ref)			(ref)			(ref)			(ref)			(ref)			(ref)		
High	1.22	(0.69, 2.16)	1.00	1.21	(0.68, 2.15)	1.00	1.02	(0.61, 1.70)	1.00	1.03	(0.66, 1.61)	1.00	0.92	(0.54, 1.57)	1.00	1.01	(0.57, 1.79)	1.00
Moderate	1.20	(0.69, 2.10)	1.00	1.19	(0.68, 2.08)	1.00	0.83	(0.48, 1.44)	1.00	0.70	(0.47, 1.05)	0.24	1.04	(0.61, 1.77)	1.00	0.77	(0.52, 1.13)	0.54

| Low | 1.18 | (0.70, 2.00) | 1.00 | 1.17 | (0.69, 1.99) | 1.00 | 1.14 | (0.69, 1.87) | 1.00 | 1.03 | (0.67, 1.60) | 1.00 | 1.02 | (0.63, 1.65) | 1.00 | 0.69 | (0.45, 1.04) | 0.23 |

Note. aOR = Adjusted odds ratio, CI = Confidence interval, ref = Reference category; Bold font denotes statistical significance

[a] Based on 2017 U.S. Preventive Services Task Force guidelines

[b] Based on 150 minutes of moderate activity per week, 75 minutes of vigorous activity per week, or a combination of both

[c] Defined as self-reported smoking of at least 100 cigarettes in lifetime and current daily or someday smoking

[d] Adjusted for age, birthplace, education, household income, health insurance, field center, years lived in the U.S., years lived in neighborhood, and health behavior at Visit 1

[e] Excessive alcohol drinking defined as >14 drinks per week on average for men <65 years old or >7 drinks per week on average for men 65 years old and all women. Binge alcohol drinking defined as women who reported drinking 4 drinks or men who reported drinking 5 drinks within a 2-hour period at least once a month

[f] Based on systolic or diastolic blood pressure >140/90 or if the participant self-reported as currently taking antihypertensive medications

[g] Based on a body mass index 30 kg/m^3