Neighborhood Social Cohesion and Walking Limitations in Ethnically Diverse Older Latinos in the United States

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Walking is the most common form of physical activity and socially cohesive neighborhoods may provide the context for racially/ethnically diverse groups to maintain an active lifestyle, particularly at older ages. Among Latinos, the association between neighborhood cohesion and walking behaviors may additionally differ by Latino group. We examined the association between neighborhood social cohesion and walking limitations among Latinos overall and by specific Latino groups. We combined data from the 2013 to 2016 National Health Interview Survey (NHIS) and selected adults aged ≥60 years (n= 3,716). Walking limitations were assessed based on responses to the "experienced difficulty walking" survey question. Social cohesion was measured using four NHIS questions regarding neighborhood social cohesion. Logistic regression models were stratified by Latino subgroup. Mexican Americans represented the largest proportion of the sample (55%). Cubans had the highest proportion of individuals reporting high neighborhood social cohesion (51%), while Dominicans had the lowest proportion (29%). In the total sample, those with high and medium neighborhood social cohesion reported lower odds of walking limitations. Although tests for interaction were not statistically significant, stratified analyses showed that all Latino groups had lower odds of walking limitations if they lived in a high social cohesion neighborhood compared with low social cohesion neighborhoods. Our results suggest that neighborhood social cohesion is associated with walking limitations among diverse groups of older Latinos. *Ethn Dis*. 2019;29(2):247-252; doi:10.18865/ed.29.2.247

Introduction

Walking is the most common form of leisure time physical activity (PA) in the United States.[1] However, the percentage of adults who report walking as a form of physical activity decreases with increasing age, and on average, older adults only spend 13 minutes a day or about 90 minutes per week walking.[1] These walking time averages for older adults mean they are getting only slightly more than half of the recommended 150 minutes of aerobic physical activity each week.[2]

Walking behavior also varies by race and ethnicity, with Latinos being less likely to walk or meet PA guidelines than non-Latino Whites. National data have shown that non-Latino Whites and Asians were more likely than Latinos and non-Latino Blacks to report walking during leisure time, although non-Latino

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Whites were less likely to walk for transportation.[3] Latinos are one of the fastest growing populations in the United States and have an array of cultural/ethnic backgrounds due to the diverse countries from which they originate in Latin America. This diversity of backgrounds, combined with distinctive immigration histories,[4,5] has been shown to influence health and health behaviors in complex ways.[6] For example, in a study by Neighbors et al, Latinos as a group had lower levels of leisure-time physical activity than non-Latino White participants but these differences were more pronounced when stratified by Latino subgroups. Specifically, Mexican American participants were the most active while Cuban and Dominican subgroups were the least active.[7] These findings suggest the role not only of cultural factors in explaining group differences but broader built environment or neighborhood determinants shaping physical activity given the spatial concentration of Latinos in select areas of the United States.

While interest in understanding the contribution of neighborhood determinants on walking patterns of older adults is growing, few studies have focused on Latino populations. Further, the majority of research

studies have examined built environment characteristics,[8] rather than social dimensions such as neighborhood social cohesion.[9] Research on older adults suggests that the elderly reside within a multilayered social environment and the characteristics of those layers are important for understanding their impact on functional outcomes such as walking.[10]

The aim of our study was to examine the association between neighborhood social cohesion and walking limitations in a nationally represen-

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tative sample of ethnically diverse older Latinos. We hypothesized that older Latinos living in low social cohesion neighborhoods would be more likely to have walking mobility limitations than those living in highly cohesive neighborhoods. Additionally, we tested whether associations between neighborhood cohesion and mobility differed by ethnicity in this Latino sample.

METHODS

We combined data from the 2013 to 2016 National Health Interview Survey, a nationally representative survey of non-institutionalized adults aged ≥18 years in the United States. Survey details can be found elsewhere. [11] Our analytical sample included data from 3,716 adults, aged ≥60 years, who self-identified as Latino and reported their ethnic group. We categorized Latinos into five major groups: Mexican/Mexican American, Puerto Rican, Cuban, Dominican, and Central/South American.

Walking limitation, the main study outcome, was measured by self-reported walking difficulty. Limitations with walking were determined from a question asking if the participant "experienced difficulty walking" Participants reporting "some limitations" or "very limited" were classified as having walking limitations and "no difficulties" were classified as having no walking limitations.[12]

Social cohesion was measured using four questions regarding neighborhood social cohesion: 1) "People in this neighborhood help each other out"; 2) "There are people I can count on in this neighborhood"; 3) "People in this neighborhood can be trusted"; and 4) "This is a close-knit neighborhood." Response options to these questions were on a scale of 1 to 4. We created a sum score across these variables and derived tertiles of neighborhood social cohesion classified as low, medium, and high neighborhood social cohesion. A higher score indicated higher levels of neighborhood social cohesion (Cronbach's α=.93).[13]

Covariates included sex, age, edu-cation level, ethnicity (for overall Latino associations), nativity status (US-born vs foreign-born), compliance with 2008 physical activity guidelines, and self reported heart disease.

Statistical Analysis

SAS version 9.4 survey procedures (SAS Institute Inc., Cary, NC) were used for all analyses to account for the complex survey design of NHIS. Weighted descriptive statistics were generated for the total sample and by functional mobility. Logistic regression models were fit to examine the association between neighborhood social cohesion and walking limitations. To test for potential differences by Latino subgroup, we entered a cross-product term between neighborhood social cohesion and Latino subgroup in our final model.

RESULTS

Table 1 provides a description of the study sample. Briefly, the total analytical sample comprised 3,716 older Latinos. Mexican Americans represented the largest proportion of the sample (55%) followed by Central or South Americans and Puerto Ricans (15% and 14%, respectively). Cubans were the oldest group in the sample with an average age of approximately 68 years. When evaluating walking limitations (Figure 1) South and Central Americans reported the lowest proportion (30.2%) followed by Cubans (36.2%).

Table 2 shows the results from the logistic regression analyses used to examine the associations between neighborhood social cohe-

Table 1. Sample characteristics of adults ≥ 60 years of age by Hispanic subgroup: National Health Interview Survey 2013-2016, N=3,716

	Mexican/Mexican American, n=2,057	Puerto Rican, n=518	Cuban/Cuban American, n=396	Dominican, n=182	Central or South American, n=563
Demographics, %					
Male	46.2	49.1	49.7	38.0	40.8
Female	53.7	50.9	50.3	62.0	59.2
Age, years, mean	69.0 (.24)	69.6 (.37)	72.6 (.52)	70.8 (.76)	69.3 (.43)
Education, %					
< than high school	55.4	36.0	34.3	63.2	35.4
≥ high school graduate	44.6	64.0	65.7	36.8	64.6
Nativity, %					
Foreign-born	53.1	81.1	96.6	99.1	96.1
US-born	46.9	18.9	3.3	0.9	3.9
Neighborhood social cohesion, %					
Low	25.4	28.3	22.7	40.7	32.5
Medium	32.4	28.8	26.2	30.1	36.2
High	42.2	42.9	51.1	29.2	31.3
Health variables, %[a]					
Met aerobic physical activity Guideline	33.4	30.5	23.7	23.4	33.6
Coronary heart disease	11.0	11.1	14.0	10.3	8.5

a. Meets aerobic physical activity guideline, defined as ≥150 minutes of moderate-intensity aerobic activity, ≥75 minutes of vigorous-intensity aerobic activity, or ≥150 minutes of an equivalent combination of moderate- and vigorous-intensity aerobic activity per week.
SE=standard error.

sion and walking limitations in the total sample. Those with high neighborhood social cohesion reported lower odds of walking limitations (OR: .90; 95% CI:.68, 1.2), compared with those living in low social cohesion neighborhoods.

Table 3 presents the adjusted models examining the association between neighborhood cohesion and walking limitations for each Latino ethnic group (P>.05). Although P was not statistically significant, exploratory analyses showed that, in general, all Latino groups had similar patterns as the main effect models of reduced odds of walking limitation if they lived in high vs low social cohesion neighborhoods. However, models were slightly more stable (smaller CIs) for Mexican/Mexican Americans likely due to the larger sample size of this population.
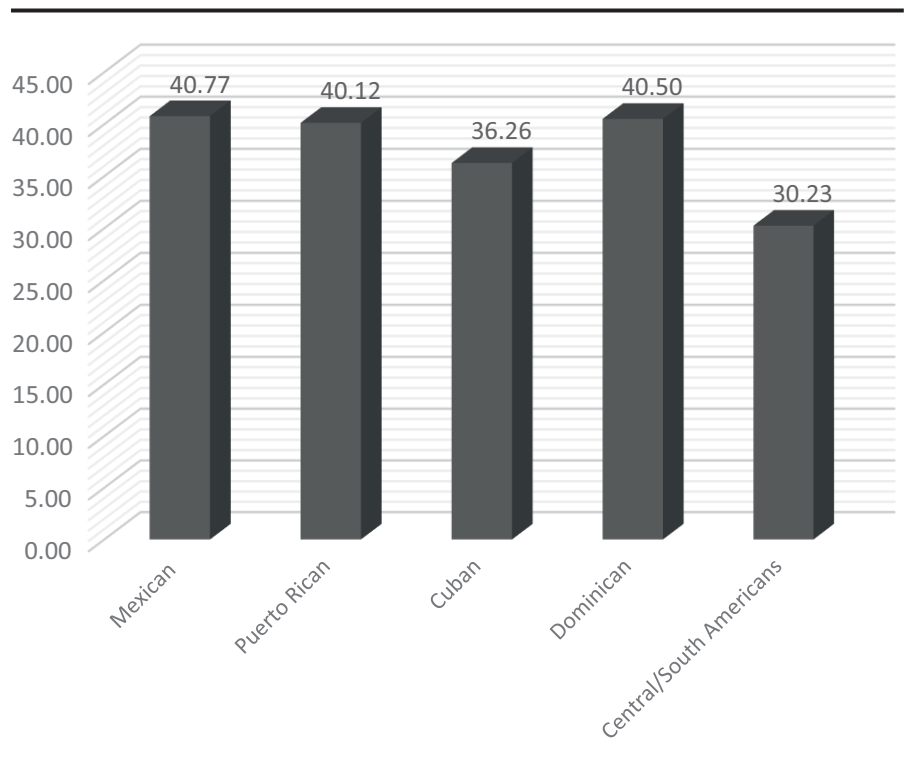

Figure 1. Prevalence of walking limitations by Latino group, National Health Interview Survey 2013-*2016*

DISCUSSION

In this large diverse sample of older Latinos, high and medium levels of neighborhood social cohesion were consistently associated with reduced odds of walking limitations. These results were generally robust to adjustment for age, sex, ethnicity, educational attainment, nativity, compliance with physical activity guidelines, and self-reported heart disease. In exploratory analyses (P>.05), there were no substantive differences in the association between neighborhood social cohesion and walking limitation across Latino ethnic group. Our results are similar to those of Mendez de Leon[14] who found that older adults who live in more socially cohesive neighborhoods reported

higher levels of walking on average. Like our study, the neighborhood-level effect in their study appeared attributable to individual residents' perceptions of neighborhood social cohesion.[14] A possible explanation for this finding could be linked to unexplored cultural factors or possibly living with co-ethnic peers; this concept

needs further exploration. For instance, most work to date has focused on non-Latino White and Black differences, without considering how neighborhoods may differentially influence mobility for Latinos who have varying cultural, socioeconomic and nativity status backgrounds.

Within the context of the neigh-

Table 2. Association between neighborhood social cohesion and walking limitations among older Latino adults, National Health Interview Survey 2013-2016

	Walking limitation		
Social Cohesion	**Model 1 OR, (95% CI)**	**Model 2 OR, (95% CI)**	**Model 3 OR, (95% CI)**
Low	Ref	Ref	Ref
Medium	.81 (.64,1.0)	.81 (.63,1.0)	.86 (.65,1.1)
High	.88 (.69,1.1)	.81 (.62,1.0)	.90 (.68,1.2)

OR=odds ratios. CI=confidence interval.
Model 1 unadjusted.
Model 2 adjusted for age, sex, education and ethnic group.

Table 3. Association between neighborhood social cohesion and mobility limitations by Latino group, National Health Interview Survey 2013-2016.

Neighborhood social cohesion and Latino group	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Mexican/Mexican-American	n=2,057		n=
Low	Ref	Ref	Ref
Medium	.81 (.58,1.13)	.82 (.56,1.16)	.86 (.58,1.27)
High	.81 (.58,1.14)	.81 (.56,1.16)	.84 (.57,1.23)
Puerto Rican	n=518		
Low	Ref	Ref	Ref
Medium	.78 (.43,1.42)	.92 (.50,1.71)	1.03 (.52,2.0)
High	.70 (.42,1.18)	.82 (.48,1.41)	.94 (.51,1.70)
Cuban/Cuban American	n=396		
Low	Ref	Ref	Ref
Medium	.81 (.38,1.73)	.71 (.34,1.50)	.81 (.34,1.95)
High	.88 (.39,2.0)	.67 (.31,1.48)	.76 (.27,2.11)
Dominican	n=182		
Low	Ref	Ref	Ref
Medium	.56 (.26,1.22)	.46 (.19,1.08)	.52 (.22,1.26)
High	.75 (.26,2.0)	.54 (.19,1.52)	.70 (.23,2.16)
Central or South American	n=563		
Low	Ref	Ref	Ref
Medium	.92 (.54,1.58)	.90 (.52,1.57)	.84 (.47,1.51)
High	1.35 (.72,2.5)	1.21 (.62,2.4)	1.33 (.65,2.74)

OR=odds ratios. CI=confidence interval.
Model 1 unadjusted
Model 2 adjusted for age, sex, education.
Model 3 adjusted for model 2, plus nativity, meeting physical activity guidelines and self-reported heart disease.

borhood environment, social cohesion can represent a key factor in older adult's lives that can influence disability outcomes. Currently, there is a scarcity of research addressing walking limitation and its relation to social cohesion among diverse samples of Latinos. In our study, we found that only among Mexican/Mexican Americans does social cohesion appear to exert a statistically significant effect. Angel and colleagues evaluated social network components and the interchange of supportive resources and found this interchange to be more highly valued among Mexican Americans than non-Latino Whites.[15] Yet, how perception of social resources affects mobility limitation among different Latino ethnic groups has not been well-characterized. In previous studies, individual perceptions of the neighborhood environment have been associated with walking in research that focused on characteristics such as convenience, safety, and attractiveness.[16,17] Other findings suggest that neighborhood social cohesion is important to understanding walking behavior in older adults, but only to the extent that they affect differences in walking levels between neighborhoods (ie, contextual factor),[18] rather than individual level differences in perceptions of social cohesion as investigated in our study.

Our study has several limitations that should be considered. First, 'walking limitation' is self-reported, and thus subject to measurement error. Second, institutionalized older adults were not sampled in the NHIS and thus results only apply to the noninstitutionalized elderly population. Third, measures of neighbor-

hood characteristics are also based on self-report. However, we assessed the reliability of the four items we used as a measure of neighborhood social cohesion and found it to have high internal consistency in our previous research.[13] As suggested by the work of Clark et al, it is possible that chronic exposure to low social cohesion neighborhoods may have different implications for the onset of mobility limitation than short-term exposure to low cohesion neighborhoods,

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In this large diverse sample of older Latinos, high and medium levels of neighborhood social cohesion were consistently associated with reduced odds of walking limitations.

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which we were not able to evaluate.[17] Finally, the results of this study are limited by a cross-sectional design, which precludes any consideration of causality, or even the temporal nature of the associations. Longitudinal studies with larger samples of Latinos are needed to confirm the temporal order of association between walking limitations and neighborhood cohesion. This is particularly needed for investigating differences by Latino groups, given the sample size

limitations observed in our analysis.

Despite these potential limitations, our study has several strengths that should be noted. First, this examination was not limited to older adults living in a single community. The sample of NHIS Latino adults is derived from adults residing throughout various locations in the United States and is not specific to select regions. Second, this study is based on a large population sample of community-dwelling older Latinos with little missing data. The study sample includes persons up to aged 90 years, for whom previous research knowledge is rather limited. Moreover, this is an ethnically diverse sample that enhances our evaluation of the role of neighborhood cohesion in health.

CONCLUSION

This study adds to the current evidence of neighborhood environment influencing the functional health of older adults by examining how neighborhood social cohesion relates to walking limitations in a diverse sample of Latinos. Our main finding has health policy implications by underscoring the need to address the neighborhood context, as a potential risk factor that can mitigate functional limitations among Latinos. Our results also highlight the need for future studies including neighborhood cohesion as an important determinant of overall health among racial and ethnically diverse older adults.

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