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Protective neighborhoods: Neighborhood proportion Mexican American and depressive symptoms among very old Mexican Americans

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Abstract

Research indicates that neighborhood context can have a significant effect on the health of elders. The evidence suggests that there may be physical health benefits afforded to Mexican Americans living in ethnically homogenous neighborhoods, despite the relatively high economic risk in such neighborhoods. However, few studies have considered the impact of neighborhood ethnic density on mental health outcomes in older adults. This study evaluates the association between neighborhoods with a high proportion of Mexican Americans and depressive symptoms among very old Mexican Americans. Hierarchical linear modeling was used to examine data from Wave 5 (2004–2005) of the Hispanic Established Population for the Epidemiological Study of the Elderly (H-EPESE). Subjects included 1,875 community-dwelling Mexican Americans aged 75 and older living in 386 neighborhoods across five states in the Southwestern United States (Arizona, California, Colorado, New Mexico, Texas). Depressive symptoms were measured with the Center for Epidemiologic Studies Depression Scale (CES-D, α =0.88). Results showed that among very old men, there was a significant negative association between percent Mexican Americans in the neighborhood and depressive symptoms (P=.011). Although among women the direction of the association was the same, the effect was not significant. These findings suggest that the proportion of Mexican Americans in the neighborhood matter more for very old Mexican American men than women. Further research may inform screening and treatment for depressive symptoms based on differences in neighborhood composition. Recommendations include

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Author Contributions

Kerstin Gerst: supervision, content, conception and design, analysis and interpretation of data, manuscript preparation. Patricia Y. Miranda: supervision, content, conception and design, analysis and interpretation of data, manuscript preparation. Karl Eschbach: content, analysis and interpretation of the data, statistical expertise. Kristin M. Sheffield: conception and design, interpretation of the data, manuscript preparation, statistical expertise. M. Kristen Peek: supervision, content, conception and design, interpretation of data, manuscript preparation, statistical expertise. Kyriakos S. Markides: supervision, content, conception and design, analysis and interpretation of data, manuscript preparation, obtaining funding.

culturally tailored programs that offer older Mexican Americans greater mobility and access to programs and opportunities in culturally identifiable neighborhoods.

Keywords

Neighborhood context; gender; Mexican Americans; depressive symptoms

INTRODUCTION

A growing number of researchers have reported that neighborhood context has a significant effect on the health of individuals over and above individual characteristics. Much of the multi-level research to date has reported increased risk of mortality and morbidity in economically disadvantaged neighborhoods.[1] However, researchers have found that for some groups certain cultural advantages found in neighborhoods with a high ethnic density may outweigh the socioeconomic disadvantages often found in such neighborhoods.[2] Research using data from the Hispanic Established Population for the Epidemiological Study of the Elderly (H-EPESE) found that among Mexican Americans aged 65 and older living in neighborhoods with a high proportion of Mexican Americans was associated with lower mortality over a seven year period,[2] fewer physical health problems including stroke, self-reported cancer, hip fracture,[2] cognitive functioning,[3] and better self-rated health.[4]

This evidence suggests that there may be physical health benefits afforded to Mexican Americans living in neighborhoods with a high proportion of other Mexican Americans, despite the relatively high economic risk in such neighborhoods. However, very few studies have considered the impact of high proportion Mexican American neighborhoods on mental health outcomes. It is particularly important to understand the association of neighborhoods and mental health outcomes, such as depressive symptoms. Depression increases the odds of both mortality and morbidity, and it is a serious public health concern,[5] and is projected by the World Health Organization to be the second leading cause of disability worldwide by 2020.[6]

To date only one study has examined the association of neighborhood ethnic enclaves on depressive symptoms among Mexican American elders.[7] Ostir and his colleagues examined baseline (1993/94) data from the H-EPESE and found that Mexican Americans aged 65 and older living in neighborhoods with a higher proportion of Mexican Americans were less likely to have higher depressive symptoms, despite relatively high poverty rates in these neighborhoods. This suggests that a positive neighborhood effect is present for mental health outcomes in addition to the physical health outcomes also found among Mexican American elders. However, it remains to be established whether this finding holds true for those aged 75 and over and whether this is the case for both men and women.

It may be particularly important to examine the neighborhood context among adults aged 75 and older because older adults spend more time in their neighborhood and are more likely to have live in the same neighborhood for long periods of time.[8, 9] A combination of increased time in the environment and declining spatial realm may therefore make older adults increasingly susceptible to neighborhood forces[9, 10] and may make the neighborhood contextual variables more relevant to their health.[11] Although the research on the increased importance of the neighborhood at older ages has not specifically focused on minority populations, it is likely that the impact is similar for Mexican American elders.

Currently no evidence exists on whether the relationship between the percent Mexican American in neighborhoods and mental health persists into older ages for Mexican

Americans. Recent research on neighborhood socioeconomic status (SES) effects on the health of elders in Canada suggests that although neighborhood SES effects on depression were slightly weaker for older adults (aged 75+ versus 65–74), they nevertheless were strong and significant [12]. Another study, however, found that depressive symptoms were not significantly associated with ethnic composition among persons aged 70 and over in the United States.[13] Neither study focused on Mexican American elders specifically, so it remains unclear whether at older ages the importance of percent Mexican American in the neighborhood will remain significantly associated with depressive symptoms.

In addition, no research to date has examined any potential gender differences in neighborhood effects on depressive symptoms. Some research has found that the association between perceptions of neighborhoods and health differ significantly between men and women, although none of the studies examined objective measures specifically [14]. Stafford and colleagues (2005) speculate that there are three reasons for this gender difference, including differences in perception of the environment, differences in exposure to the various aspects of the neighborhoods and differences in the vulnerability to aspects of the local environment. The authors argue that although the neighborhood context is relevant to both men and women, salient factors may differ by gender.

This may be particularly likely for depressive symptoms. Extant literature has consistently found a female preponderance in depression cross-culturally, especially in developed countries.[15] This higher rate of depressive symptoms among women has been attributed to an interaction between biomedical and social factors. It has been speculated that persons living in ethnic enclaves are more likely to have access to social capital because it is offered by area residents with common identities.[16, 17] However, studies have also found that there are gender differences within such social capital formation and its effect on depression.[18–21] Social associations can depend on structural opportunities and constraints, which may differ by gender. Whereas structural opportunities (e.g. jobs outside of the home) occur more often in men, structural constraints (e.g. responsibility for childrearing and house care) are more likely in women.[21] This results in closer ties to family networks for women and with non-kin for men,[21] which may be particularly the case for Mexican Americans. Summarizing research findings among older Mexicans, Varley & Blasko[22] report that men are described as being “of the street”, whereas women are considered “of the house”. It is thus likely that men are more integrated into the neighborhoods, whereas women’s sphere is contained more to the household and family. Therefore, neighborhoods may have a different effect on depressive symptoms for men and women.

Below we use recent large epidemiological data on older Mexican Americans to explore the impact of neighborhood percent Mexican American on depressive symptoms among elders aged 75 and older and across gender. To our knowledge, this is the first study to examine neighborhood-level effects on mental health among very old Mexican American by gender. Specifically, we examine the association between proportion Mexican American in neighborhoods and depressive symptoms among very old Mexican American men and women.

METHODS

Sample

Individual level data were taken from Wave 5 (2004–2005) of the Hispanic Established Population for the Epidemiological Study of the Elderly (H-EPESE). The H-EPESE is a prospective study examining the health and healthcare needs of Mexican American elders. In 1993–1994, area probability sampling was used to obtain a baseline cohort of 3,050 Mexican Americans aged 65 and over from five Southwestern states (Texas, New Mexico,

California, Arizona and Colorado).[23] Follow-up surveys were conducted every two to three years. The fifth Wave (2004–2005) added an additional probability sample of 902 Mexican Americans from the region, resulting in a combined sample of 2,069 all aged 75 and older.[24] The University of Texas Medical Branch (UTMB) Institutional Review Board (IRB) first approved the current study on February 21, 1992 (IRB No. 92–85). Since that date, the study has been approved annually under continuing review procedures.

From the full sample of 2,069, several key variables of interest contained missing data, including the variables used to calculate the depressive symptom scale (N=167), marital status (N=5), ADL limitations (N=1) and chronic diseases (N=45), and these respondents were dropped from the analysis. Some respondents were missing information in more than one of these categories. The analysis below therefore utilizes data from 1,857 subjects who had completed data on relevant variables at Wave 5 in 2004–2005.

All individual level data were geocoded to their associated census tract of residence information using data from the 2000 US Census Summary Files.[25] Following the example of previous research, neighborhoods were approximated using census tracts,[3, 7] which are small geographic entities within counties, and are designed by the Census Bureau to be homogenous in terms of population characteristics, economic status and living conditions.[26]

Outcome variable—Depressive symptoms were measured using the 20-item Center for Epidemiological Studies Depression Scale (CES-D, α =0.88). Scores potentially range from 0–60, with higher scores indicating higher depressive symptomatology. This instrument has been used widely with older Mexican Americans and has been shown to have high internal consistency across age and racial/ethnic subgroups,[27, 28] and factor structures that have been consistent even in the very old [29]. Due to the positively skewed distribution of the CES-D variable (skewness statistic=1.418, standard error=.057), we transformed the score using the natural log.

Independent variables—The multi-level models employed controlled for both individual as well as neighborhood level variables. Individual level covariates included immigrant status, age (continuous) and marital status (married versus other). Following previous research using this dataset,[24] education was dichotomized as having less than seventh grade education (reference category) or at least seven years of education. This is due to the relatively low level of education attainment in the sample, where approximately 71% of the sample had less than a 7th grade education. Additionally, analyses controlled for physical co-morbidities by creating a summary index of the number of major medical conditions subjects reported ever having been diagnosed by a doctor (cancer, heart attack, stroke or diabetes). Respondents were also coded as disabled in activities of daily living (ADL) if they reported needing help with one or more of the following limitations: bathing, using the toilet, transferring from bed to chair, walking across the room, dressing or eating.

Neighborhood level variables included percent Mexican Americans in the census tract as well as the percent living in poverty (as coded by US Census). Both variables were scaled to range from 0 to 1 in order to interpret the coefficients more easily. The analyses included data on 386 census tracts across all five southwestern states.

Statistical Analyses

Differences in descriptive characteristics between men and women were examined using chi-square tests (categorical) and t-tests (continuous variables) using SAS® 9.2 (Cary, NC) to adjust for complex sample design. Hierarchical linear models were used to examine the association of neighborhood and individual level variables with CES-D score. Multi-level models were estimated using HLM 6.04 software (Scientific Software International), a

statistical software program specifically designed for estimating models with data containing hierarchical structures. All analyses applied individual-level weights.

RESULTS

Descriptions of the sample (Table 1) are presented for 1,145 women and 712 men over age 75. As expected, women have significantly higher mean CES-D scores. Men had an average score of 7.9 depressive symptoms, whereas women had a mean score of 10.7 ($p<.001$). Other sample characteristics that differed by gender were in the expected direction: men were significantly more likely to be married ($p<.001$) and women were more likely to report at least one ADL limitation compared to men ($p<.001$).

Initial hierarchical linear models (not shown here) showed a significant interaction of gender and percent Mexican Americans in the neighborhood on depressive symptoms, suggesting a stronger protective influence among men than among women. Thus, all multi-level models analyzing the association between neighborhood percent Mexican Americans and depressive symptoms were estimated for men and women separately (Table 2). The intercepts only models (Models 1 and 3) were run to determine if the probability of depressive symptoms varied across census tracts. For both men and women the intercept only models were significant, so all subsequent models were run using random intercepts.

After controlling for individual level factors and for neighborhood poverty, there was a significant negative association between percent Mexican Americans in the neighborhood and depressive symptoms for men (Model 4), but not among women. The intraclass correlation (ICC) for the full model showed that the proportion of variation that is between neighborhoods was higher for women than men. However, the change in ICC from the intercept only model to the full model (which included all level-1 and level-2 covariates), suggests that these variables accounted for more of the variance in depressive symptoms among men than among women.

In the full model of men only (Model 4) we find that men with at least one ADL limitation ($B=0.34$, $SD=.10$) were significantly more likely to report higher depressive symptoms. Number of medical conditions was also positively associated with depressive symptoms ($B=.16$, $SD=.04$) among older men. On the other hand, being married was associated with fewer depressive symptoms for men ($B=-.27$, $SD=.09$). Predictors of depressive symptoms were somewhat different for women (Model 2), with education (seven years of more) having a negative association depressive symptoms ($B=-.28$, $SD=.07$) and having at least one ADL limitation being positively associated with depressive symptoms ($B=.52$, $SD=.07$).

DISCUSSION

This is the first article to examine neighborhood-level effects on depressive symptomatology among very old Mexican American elders separately by gender. The analyses showed that women had a significantly higher CES-D score compared to men, which confirms the well-established gender disparity in depression.[15] We find that for both men and women depressive symptomatology varied significantly across neighborhoods. We found a negative association between percent Mexican American in the neighborhood and depressive symptoms among men but not among women. In other words, there appears to be a significant protective enclave effect for very old men, independent of individual-level characteristics, suggesting that the finding is not solely due to compositional effects. Although the direction of the association was the same for men and women, the effect was not significant among women.

Previous research has found a positive ethnic enclave effect for depression among a relatively younger (65 and older) group of Mexican Americans.[7] It appears that this association remains at older ages (75 and older), but only among men. The gender difference found in this study is similar to findings by George and colleagues,[20] who examined the impact of subjective social support on depressive symptoms. Their survey of middle aged and older adults found that social support was related to depressive symptoms significantly more strongly for men than women, although it was significant for both.

Our findings may reflect cultural differences in gender roles found within this population. While neighborhoods may well be important for women as well, the life-space of many older Mexican American women is more likely to be limited to the home and the immediate family. This may be due the greater structural opportunity afforded to men, which provides them greater possibility of interacting with the larger neighborhood or community. This explanation concurs with the hypothesis by Stafford et al (2005) that one reason for the gender differences in the impact of neighborhoods may be due to a dose-response relationship between the environment and health. Additionally, the authors argue that occupational factors are more important for men and that the home environment is more salient for women's health. The ties to the neighborhood created throughout the life course are likely to be sustained even after retirement, and can therefore remain salient even in older adulthood. In addition, the higher rates of ADL limitations found among women suggest lower mobility for women to men, which may further restrict their ability to interact with the neighborhood.

This study had several limitations that should be noted. First, the CES-D scale is not a clinical diagnosis of depression, but rather a measure of the number of depressive symptoms. Therefore, no clinical assumptions can be made. We also excluded respondents who did not complete all 20 items of the CES-D scale (n=167). While it is not clear how this biases the results, it is worth noting that the excluded cases were significantly different on several variables. Persons excluded had lower education, were older, and had more chronic conditions. Additionally, although the use of census tract to approximate neighborhoods is common practice in the literature, it may be possible that there are problems associated with this measure. It is not clear whether the census defined tracts approximate the reality of what a "neighborhood" means to respondents and it may therefore be an artificial measure. Despite these limitations, our findings contribute to the extant literature by examining neighborhood effects on depressive symptoms separately by gender in very old Mexican Americans.

Conclusions and Implications

The results in this article confirm previous findings that higher percent of Mexican Americans in the neighborhood appear to provide a protective effect for Mexican American elders, despite socioeconomic disadvantages in such neighborhoods. However, this appears to only be statistically significant for men and not women. The findings underscore the need for research on mental health of Mexican American elders to consider the neighborhood context as well as individual characteristics. Multi-level analyses that stratify by gender may provide a better understanding of the etiology of depressive symptoms.

In addition, such findings have policy as well as clinical implications. We recommend that clinicians consider the role of the neighborhood in the screening and treatment of depressive symptoms in older men. Findings suggest that in addition to individual resources, men may have external resources available to them in the neighborhood environment. Treatments and interventions should therefore consider not just proximal social connections, but also consider neighborhood context.

The results from this research should also underscore to local policy makers and social service providers the importance of the ethnic makeup of the neighborhoods. Knowing that certain neighborhood characteristics may influence depressive symptoms can allow for appropriate structural interventions. For instance, it may be useful to create culturally tailored community programs for Mexican American elders living in low-density ethnic neighborhoods, in order for them to gain access to other ethnic elders. The gender difference found in this research indicates that while community level prevention programs may be beneficial for both men and women, specialized neighborhood programs targeted at men might be particularly useful.

Future research should examine if such an ethnic enclave effect holds true for other minority populations (possibly Asian communities), and if differences by gender are found. Additionally, longitudinal studies will allow us to examine the pathways underlying the link between neighborhoods and mental health.

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Table 1

Subject characteristics by gender Hispanic Established Population for the Epidemiological Study of the Elderly, 2004–2005

Characteristic	All Subjects (N=1,857)	Women (N=1,145)	Men (N=712)
Mean CES-D Score (range 0–51)	9.5	10.7	7.9%***
Immigrant	43.2%	42.8%	43.9
Married	43.1%	28.3%	66.2%***
Education (7th grade and higher)	33.5%	33.2%	34.0%
Mean Age (Range 75–109)	81.6	81.6	81.4
Any ADL disability	31.3%	35.8%	24.4%***
Mean # of Chronic diseases (Range 0–4)	0.69	0.68	0.69

Note: All numbers based on weighted data, total N based on unweighted

Data: Hispanic Established Populations for the Epidemiologic Studies of the Elderly, 2004–2005

* P<0.05;

** P<.01;

*** P<.001 across gender

Table 2

Results from multilevel regression models predicting the logged number of depressive symptoms among Mexican American adults aged ≥75 years, Hispanic Established Population for the Epidemiological Study of the Elderly, 2004–2005

	β (Standard Error)			
	Women (N=1,145)		Men (N=712)	
	Model 1	Model 2	Model 3	Model 4
Individual-level variables				
Immigrant		.06 (.07)		0.14 (0.08)
Married		−.08 (.07)		−0.27 (0.09)**
Education (≥7th grade)		−.28 (.07) ***		0.11 (0.10)
Age		.00 (.01)		0.01 (0.01)
Any ADL		.52 (.07) ***		0.34 (0.10)**
Chronic disease		.02 (.04)		0.16 (0.04)***
Neighborhood-level variables				
% Mexican-American		−0.04 (.03)		−0.07 (0.03)**
% Poor		.01 (.01)		0.03 (0.01)
Intercept	2.14 (0.05)***	2.06 (.08)***	1.91 (0.05)***	1.74 (0.10)***
Random Effect Variance Components				
Intercept (U0)	0.23	0.19	0.11	0.08
Level-1 (R)	0.75	0.68	0.80	0.75
Intraclass Correlation (ρ)	0.23	0.22	0.12	0.09

* P<0.05;

** P<.01;

*** P<.001

All numbers based on weighted data