

Racial Differences in Neighborhood Safety, Poverty, and Self-Rated Health

Thanh V Tran

Boston College
School of Social Work

Rosanna De Marco

University of Massachusetts Boston
College of Nursing and Health Sciences
Department of Nursing

Fatma Zohra Mataoui

University of Massachusetts Boston
College of Nursing and Health Sciences

Kaipeng Wang

Boston College
School of Social Work

Abstract

Objectives. Guided by a sociological model of the effects of neighborhood segregation and a quality of health model that includes the relationship between structure, process, and outcomes applied to neighborhoods, this study examines the effect of perceived neighborhood safety and poverty on self-rated health status across Asian, Black, Latino, and White Americans.

Methods. We conducted a secondary analyses using the 2009 and 2011 California Health Interview Survey. The sample is comprised of 83,507 respondents aged 18 to 85 including 9,127 Asians, 4,029 Blacks, 12,206 Latinos, and 58,145 Whites. We used logistic regression and tested the interaction effects between race, neighborhood safety and poverty level on self-rated health.

Results. The results revealed that race and perceived neighborhood safety had a statistically significant interaction effect on self-rated health ($F(7, 73) = 43.60, p = .001$). Similarly, the interaction effect between race and poverty on self-rated health was also statistically significant ($F(7, 73) = 127.29, p = .001$).

Conclusion. Perceived neighborhood safety and poverty exert negative effect on self-rated health and their effects varied among racial groups. Both variables are important for the understanding of health disparities among racial groups. Using the context of structure, process, and outcomes within neighborhoods, the sociologic model of residential segregation which ties SES, neighborhood safety, and physical activity across races as predictors of perception of poor health continues to prevail.

INTRODUCTION

Despite efforts of the US health system and health organizations to conquer health disparities in access and quality of care (Betancourt, Corbett & Bondaryk 2014; Federico, Tjoeng & Berman, 2007), minorities and immigrants experience deterioration in their self-reported health status as a health outcome as reported by many studies (Aqtash & Van Servellen, 2013; Brewer et al, 2013; Griffith et al, 2011). We know there are sociologic and perceptions-of-health differences between immigrants and those minorities with sustained generational poverty in the United States. However, prior published data includes findings that suggest that what we know is riddled with greater complexity than we thought. Embedded in minority or immigrant perceptions of health is the location where they live and their level of income because of the relationship between these two structures. For example, Kandula and colleagues (2007) found that health status measures used in collecting perceptions of health need to be less susceptible to cultural bias particularly in the Asian and Latino communities. It is also understood that racial segregation in neighborhoods congregates groups that are similar from a socioeconomic status (SES) perspective. Yet health researchers have not given attention to the causes of racial disparities in SES that are perpetuated by determination of education and employment opportunities by where racially diverse groups live (Williams & Collins, 2001). Finally, neighborhood safety, SES, and physical activity are highly related to determinants of mental and general health (Meyer, Castro-Schilo, & Aguilar-Glaxiola, 2014; White & Borrell, 2011).

While sociologic literature continues to support the undergirding theory that it is residential segregation that initiates and compounds health disparities, we also know that complexity in neighborhoods must include health outcomes as perceived from an interaction of structure and process experienced uniquely across races. Taken from the Donabedian Model of Health Quality, what we need to understand is that in health care systems at the micro or macro level is the reality that structure, process and outcomes are related to one another across any phenomenon of interest. Without exploring these complexities we miss a complete understanding of experiences in perceptions of health and healthcare (Donabedian, 1988).

For example, outcomes from a variety of neighborhood processes include, people living in resource-limited geographic areas have reported poorer health outcomes, and people living in segregated and high-crime areas often experience increased risk of developing cancer (Freedman, Grafova & Rogowski, 2011; White et al., 2011). These findings imply that there is a relationship between resource deprivation, social segregation and safety as an interactive process that impacts health in some way (Freedman et al., 2011; White et al., 2011). In addition to resource deprivation, availability of services that support unhealthy lifestyle options like the process of allowing the ubiquitous presence of liquor stores in African American communities affect health outcomes negatively (LaVeist & Wallace, 2000). Besides the importance of access to positive resources or goods for positive health outcomes, the experience of ethnic discrimination is highly correlated with poorer reported health, and feelings of lack of safety in the neighborhood; in fact, perceived discrimination is found to be related to binge drinking behavior as an unhealthy way to compensate for not feeling connected or wanted in one's neighborhood structure (Crengle et al., 2012; Cummins, 2007). Islam (2014) identified in south Asian Canadian-born people a strong positive relationship between social capital and social support and mental and physical health.

Physical environment is considered as a structure or determinant of health. Research has found that lack of green space was associated with poorer health in under-represented communities that lacked health resources (Maas et al., 2009). Moreover, living in green spaces

is correlated with positive levels of mental health, and this relationship was even stronger for children and people of low socioeconomic status (Maas et al., 2009). The relationship between residents and their community can also impact their health status as Wang & Hu (2013) compared different social and environmental determinants of health within three populations of Canadian-born, Asian immigrant and overall foreign-born, Asians had the weakest sense of reported community belonging and poorer mental and physical health in comparison with other groups.

The association between immigration status and health status or well-being has been inconclusive or “paradoxical.” For example, many immigrants tend to have lower average income and education, and low socioeconomic status is usually associated with worse health outcomes and higher death rates (Blue & Fenelon, 2011). However, some studies reported that less acculturated foreign-born immigrants appear to have a better health status than U.S-born and those that are more acculturated (Wang & Hu, 2013; Eshbach et al., 2007). Other studies found that the “immigrant health paradox” was weak in Chinese immigrants (Wang & Hu, 2013; John et al., 2012; Huh, Prause & Dooley, 2008). On the contrary, there is also evidence that foreign-born Asians rated their health lower than US-born Asians. Findings from research with Hispanic Americans are also mixed such as the self-reported mental and physical health status was worse in US-born Mexicans compared with non-US-born Mexicans (Jerant, Arellanes & Franks, 2008). However, Spanish speaking Hispanics were twice as likely to report poor/fair health compared with Whites (Brewer, 2013). The mortality rate in foreign-born Hispanics was low in comparison to Whites, but show the exact opposite results when US-born Hispanics were compared to Whites (Eshbach et al., 2007). Low socioeconomic status was strongly correlated with major depressive disorders in all ethnic groups including Whites (Gavin et al., 2010), and ethnic homogeneity and density within a society was associated with better social health, as it reduced stigma and exposure to racial discrimination (Pickett & Wilkinson, 2008).

The large and growing immigrant population in the United States calls for a growing need to understand different socioeconomic and environmental processes that create determinants of their health. Environmental features such as resource limitation, lack of green spaces, and even a prevalence of liquor stores were all associated with poor identified or self-reported health in non-white neighborhoods. Social features such as high crime rate, experience of ethnic discrimination, and lack of safety feeling showed the same association with low health outcomes. Although there are limitations to self-reported health data across different ethnic groups, there is validation that different levels of environmental distress such as neighborhood unsafety and poverty condition influence negative health outcomes.

Hypotheses. We hypothesized that the negative effect of perceived neighborhood lack of safety and poverty as part of a structure and process interaction on self-rated health outcomes varied according to race. The rationale for this hypothesis is that each selected racial group in this study has its own unique cultural, historical, and socio-economic backgrounds, and the predisposing experiences caused by racial differences could moderate the impacts of perceived neighborhood unsafety and poverty on health status

METHODS

Data Sources

The 2009 and 2011 California Health Interview Survey (CHIS) data were used in this study. CHIS is considered as one of the largest telephone health surveys using both landline and cell-phone lists to select sampled households. Interviews were conducted in five languages:

English, Spanish, Chinese (Mandarin and Cantonese dialects), Vietnamese, and Korean. The 2009 and 2011 CHIS adult data consisted of 90,045 interviews conducted among participants aged 18 or older. This study's sample includes 9,127 Asians, 4,029 Blacks, 12,206 Latinos, and 58,145 Whites. A detailed description and discussion of CHIS sampling methods can be found online posted on the CHIS website (California Health Survey, 2011). Data analyses were conducted using Stata 13 for the present study (Long & Freese, 2014).

Measures

Dependent Variable. Self-rated health status was originally measured on a 5-point scale (excellent = 1, poor = 5) that was recoded to a dichotomous variable with two categories (0 = fair/poor, 1 = excellent, very good, or good). This coding procedure was the same as that employed in two previous studies using CHIS data, and the rationale for the coding is that fair/poor ratings of health status are associated with higher risk for morbidity/mortality (Finch & Vega, 2003; Grant et al., 2011).

Independent Variables. Race was coded into 4 racial groups: Asian, Black, Latino, and White. Neighborhood safety was measured by the question "Do you feel safe in your neighborhood?" This variable was coded 1 for unsafe and 0 for safe. Poverty level was coded 0 for being at 200% or above the federal poverty level and 1 for under this threshold.

Covariates. Age was measured by self-reported chronological age ranging from 18 to 85 years. Sex was coded 1 for female and 0 for male. Marital status was coded as 1 for currently married or living with a partner and 0 for other groups. Education was coded as 1 for college and 0 for high school or less. Foreign Born was coded 1 for born outside the U.S. and 0 for U.S. born.

Data Analysis. We used logistic regression and performed two stage analyses (Long & Freese, 2014). First, we tested for the interaction between race and neighborhood safety with self-rated health adjusted for the covariates and the interaction effect between race and poverty with self-rated health adjusted for the covariates. Second, we stratified our sample into 4 racial groups then performed a logistic regression for self-rated health on neighborhood safety and poverty adjusted for the covariates. This subgroup analysis not only encompasses the interaction effects of race and neighborhood safety and race and poverty, it also offers an opportunity to highlight the potential interaction effects of race and the covariates with self-rated health. All analyses were adjusted for complex survey sampling designs because CHIS employed both disproportional stratified sampling and multiple frame sampling methods (California Health Survey, 2011).

RESULTS

Table 1 presents the descriptive statistics of all variables used in the study stratified by race. With respect to self-rated health status, Black and Latinos respondents reported a greatest percent of poor health (5%) compared with (4% of Asians and 3% of White). Racial differences in perceived neighborhood safety varied from 6% of Whites who perceived that their neighborhood as unsafe compared with 12% of Asians, 15% of Blacks, and 19% of Latinos. Respondents who lived under 200% of the federal poverty level included 19% of Whites, 29% of Asians, 42% of Blacks, and 61% of Latinos. Blacks had the greatest percent of females (54%), and Latinos the greatest percent of males (51%). Whites reported the greatest average of household incomes (\$49,277) compared with \$46,032 for Blacks, \$42,928 for Asians, and \$39,617 for Latinos. Sixty percent of Whites and Asians were currently married compared with 38% of Blacks, and 59% of Latinos. More than 70% of Asians (72%) and Whites (71%) had some college education or higher compared with 61% of Blacks and 31% of

Latinos. Finally, 71% of Asians were foreign born Americans compared with 60% of Latinos, 10% of Blacks, and 9% of Whites.

Table 1. Descriptive Statistics of Variables Used in the Analysis (N=83,507)

Variables	Asian	Black	Latino	White
Mean Age (95%CI)	42.93 (42.43, 43.42)	46.03 (45.15, 46.92)	39.62 (39.23, 40.00)	49.28 (49.08, 49.47)
Female %	53.35	54.30	48.54	50.87
Married/Partnered %	60.93	38.62	59.04	63.28
Under 200%FPL %	29.32	42.25	61.24	19.25
College Education %	72.24	61.52	31.34	71.25
Foreign Born %	70.85	10.49	60.65	9.59
Unsafe Neighborhood %	12.18	15.69	19.10	5.70
Poor Health %	3.89	5.40	4.73	3.32
Income	\$42,928	\$46,032	\$39,617	\$49,277

Test for the Interaction Effect in the Whole Sample. We tested the interaction effect of race and perceived neighborhood safety on self-rated health status, and race and poverty on self-rated health in the logistic regression model (race##perceived neighborhood safety; race##poverty) and using the “testparm” procedure. The results revealed that race and perceived neighborhood safety had a statistically significant interaction effect on self-rated health ($F(7,73)=43.60, p = .001$). Similarly, the interaction effect between race and poverty on self-rated health was also statistically significant ($F(7,73) = 127.29, p = .001$). It is difficult to interpret the interaction effects from the logistic regression models; therefore we proceeded with the subgroup analysis stratified by race.

Subgroup Analyses

Asians. The results of logistic regression of perceived neighborhood safety and poverty level on self-rated health are reported under column 2 of Table 2. Both variables had a similar association with self-rated health. Asians who perceived their neighborhood as unsafe had a 3.42 times increased risk of poor health compared with those who perceived their neighborhood as safe (Odds Ratio = 3.42, $p = .002$). Similarly, Asians who lived under 200% federal poverty level had a 3.47 times increased risk of poor health compared with those living from 200% federal poverty level or higher (Odds Ratio = 3.48, $p = .001$).

With respect to the covariates used in the analysis, Age had a relative weak association with poor health status among Asians in such a way that older Asians were more likely to report a poor health status than younger Asians (Odds Ratio = 1.05, $p = .001$).

Blacks. Among Blacks, perceived neighborhood safety had no statistical association with poor health status, however, those who lived in poverty, under 200% federal poverty level reported a 3.44 times increased risk of poor health compared with those who lived at 200% federal poverty level or higher (Odds Ratio = 3.44, $p = .001$). Older age was slightly associated with poor health (Odds Ratio = 1.05, $p = .001$). Married people were less likely to report a poor health status compare with people who were not currently married (Odds Ratio = .51, $p = .003$). People with some college education or higher were also less likely to report a poor health status compare with those who had only a high school education or less (Odds Ratio = .61, $p = .01$).

Latinos. Among Latinos, respondents who perceived their neighborhood as unsafe had a 1.77 times increased risk of poor health compared with those who perceived their neighborhood as safe (Odds Ratio = 1.77, $p = .001$). Similarly, respondents who lived under 200% federal poverty level had a 2.31 times increased risk poor health compared with those who lived at 200% federal poverty level or higher (Odds Ratio = 2.31, $p = .001$). Older age was slightly associated poor health (Odds Ratio = 1.05, $p = .001$). Currently married respondents were less likely to have a poor health status compared with those who were not currently married or single (Odds Ratio = .83, $p = .004$). Finally, respondents who had some college were less likely to have a poor health status compared with those who had a high school or less (Odds Ratio = .63, $p = .00$).

Whites. Among White respondents, individuals who perceived their neighborhood as unsafe had 2.81 times increased risk of poor health compared with those who perceived their neighborhood as safe (Odds Ratio = 2.81, $p = .001$). Respondents who lived under 200% federal poverty level had 3.18 times increased risk of poor health status than those who lived at 200% federal poverty level or higher (Odds Ratio = 3.18, $p = .001$). Older age was slightly associated with a poor health status (Odds Ratio = 1.03, $p = .001$). Currently married respondents were less likely to report a poor health status compared with those who were not currently (Odds Ratio = .75, $p = .01$). Participants with College education were less likely to report poor health status compare with participants without a college education (Odds Ratio = 0.63, $p < .001$)

Table 2. Logistic Regression of Self-Rated Health Status Across 4 Selected Racial Groups

Variables	Asian (N=9,102)	Black (N=4,003)	Latino (N=12,169)	White (N=57,749)
Unsafe Neighborhood	3.42** (1.57, 7.46)	1.31 (0.83, 2.06)	1.77** (1.29, 2.44)	2.81*** (1.91, 4.14)
Federal Poverty Level Under 200%FPL	3.48** (1.69, 7.16)	3.44*** (2.37, 4.99)	2.31*** (1.61, 3.31)	3.18*** (2.69, 3.76)
Age	1.05*** (1.03, 1.08)	1.05*** (1.04, 1.05)	1.05*** (1.04, 1.06)	1.03*** (1.03, 1.04)
Female	1.30 (0.77, 2.20)	0.86 (0.56, 1.33)	1.09 (0.81, 1.48)	0.93 (0.76, 1.13)
Married/Partnered	1.04 (0.67, 1.60)	0.51** (0.33, 0.79)	0.83 (0.61, 1.13)	0.75** (0.61, 0.91)
College Education	0.66 (0.43, 1.01)	0.61* (0.41, 0.91)	0.68 (0.45, 1.04)	0.63*** (0.52, 0.77)
Foreign Born	0.98 (0.39, 2.48)	0.46 (0.16, 1.36)	0.62* (0.43, 0.90)	1.14 (0.72, 1.81)

Note: *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$. Coefficients without "*" are not significant

Cross-Racial Comparisons

The results in Table 2 indicate racial variations in the effects of perceived neighborhood safety and poverty on self-rated health status. Perceived neighborhood safety had a significant association with self-rated health status among Asians, Latinos, and Whites, but not among Blacks. Its effect on self-rated health is strongest among Asians. With respect to poverty, the results show that regardless of race, poverty had a significant association with self-rated health

status in such a way that respondents who lived under 200% federal poverty level consistently reported a poor health status compared with those who lived at 200% federal poverty level or higher. However, poverty appears to have the weaker association with self-rated health status among Latinos compared with Asians, Blacks, and Whites.

With respect to the covariates used in the analyses, age is the only variable that had consistently significant association with self-rated health status across the four racial groups. Older age associated slightly with increased risk of poor health status regardless of respondents' race. Married status associated significantly with lower risk of poor health among Blacks and Whites but not among Asians and Latinos. College education associated significantly with lower risk of poor health among Blacks and Whites but not among Asians and Latinos. Finally, foreign born status associated significantly with lower risk of poor health only among Latinos.

DISCUSSION

The results supported our hypothesis that perceived unsafe neighborhood structures and processes and the presence of poverty significantly associated with increased risk of poor health as an outcome, but this association varied across racial groups. More specifically, perceived unsafe neighborhood and the presence of poverty exert different complex interactions and impact on poor health outcomes depending on respondents' race. In the study, we found that perceived unsafe neighborhood had a strongest effect on poor health status among Asians and the weakest impact among Blacks. This could be interpreted that Asian Americans were not familiar with their local community due to that fact that 70% of them were born outside the U.S. However caution needs to be heeded with this finding since those Asians that have lived in neighborhoods for a long time may experience acculturation and this acculturation may affect how they perceive their health (Shi, Zhang, van Meilgaard, MacLeod, & Fielding, 2015).

Recent statistics from the American Community Survey also revealed that more Asian Americans could not speak English well compared with Latinos (Camille, 2013). Lack of familiarity and English skills could exacerbate the impact of perceived neighborhood unsafety on health outcomes among Asians.

The Black community as designated in most data sets is made up of individuals who identify as African American (persons born in the US descended from members of the black community living in the US since the era of slavery) and other black individuals including persons born in Africa, the Caribbean basin and parts of Central and South American (CDC, 2015). Variation across these differences often are not available statistically so that there is a deeper and tailored understanding of the differences between the Black culture when it comes to health and the environment. It may be the case that the immigrant health paradox continues to exist among Blacks from African, the Caribbean basin and parts of Central and South America. The African American community may have less perceived problems with health when situated where they live because the health of their community has been a normalized generational experience where health is constantly seen as poor and a way of life and survival (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006). In a similar way, the impact of poverty on poor health status appears to be weaker among Latinos compared with other racial groups in this study. This could be due to their resilience that may parallel the experience of African Americans (Shetgiri et. al., 2009; Cardoso & Thompson, 2010).

The variable of age and the relationship to decreased perceptions of good health seems logical across all cultures. In thinking about increasing frailty with age the more frail one becomes across any culture the more anxiety or fear about maintaining balance, decreasing falls, and maintaining instrumental functional status (Seematter-Bagnoud, Santos-Eggimann, Rochat, Martin, Karmaniola, Aminian, Piot-Ziegler, & Bula, 2010). The connection between frailty and the decrease functional status may interact negatively with the experience of living in poorer neighborhoods or unsafe environments at different scales. Feeling safe walking in a home in a poor neighborhood setting may be much different than feeling safe walking on broken pavement or in dangerous high trafficked area with cars, busses and many people. One's perception of health based on environment may be significant to the degree the perception has real risk related to frailty and possible injury.

Finally, partnered couples are often found to perceive their health in a positive light more than those that are not partnered. The reasons for this phenomenon which is verified in this study across racial groups consistently is that marriage or being with a partner encourages people to maintain good health behaviors and have good social support and a sense of purpose and responsibility to stay healthy in life (Zheng & Thomas, 2013).

This study does have a few limitations including the representativeness of the sample and measures of neighborhood unsafety. Since the data were collected in California, any implications of the results toward the larger population should be cautious. Second, the measurement of perceived neighborhood safety should be refined to encompass other dimensions relevant to health outcomes. Nevertheless, this study's results are important in the effort to reduce health disparities among different racial and ethnic groups in our diverse society.

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