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ORIGINAL ARTICLE

Ethnicity, educational attainment, and physical health of older adults in the United States

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Abstract

Objective: Minorities' diminished returns theory suggests that socioeconomic status (SES) resources generate fewer health benefits for racial and ethnic minority groups, compared to the majority group. The current study aimed to compare Hispanic and non-Hispanic white older adults for the association between educational attainment and poor physical self-rated health (SRH).

Methods: The first wave of the University of Michigan National Poll on Healthy Aging (UM-NPHA) included 1820 older adults who were 50-80 years old and were either non-Hispanic white (n = 1618) or Hispanic white (n = 202). The main independent variable of interest was educational attainment. The main dependent variable of interest was poor physical SRH. Gender, age, marital status, and employment status were covariates. Ethnicity was the focal effect modifier.

Results: Overall, higher level of educational attainment was associated with better physical SRH. A significant interaction was found between ethnicity and level of educational attainment, which was indicative of a smaller physical SRH gain due to high educational attainment for Hispanic white compared to non-Hispanic white older adults. In ethnic-specific models, we found evidence suggesting that high educational attainment reduced the odds of poor physical SRH for non-Hispanic whites but not for Hispanic whites.

Conclusion: Compared to non-Hispanic whites, Hispanic whites gain less physical SRH benefits from their educational attainment.

KEYWORDS

ethnicity, Europeans, Hispanic whites, Hispanics, population groups, race, self-rated health, socioeconomic status, subjective health, whites

1 | INTRODUCTION

Although overall, high socioeconomic status (SES) is associated with better health among populations and individuals,[1-3] these effects are unequal across racial and ethnic groups, with racial and ethnic minorities being at a relative disadvantage compared to the majority group.[4,5] As explained by the minorities' diminished returns theory,[6-10] racial and ethnic minorities, particularly blacks, gain fewer health benefits from the very same SES resources, compared to whites.[4,5,11-18] For instance, several SES resources,[4,5,18] such as educational attainment[12] and income,[9,12,19] are showing stronger correlation with the health status of whites than blacks.

The literature on the link between SES indicators (eg, educational attainment and income) and risk of morbidity[1,2,20-22] is very rich. Both original[23-31] and review[32] papers have shown clearly that social patterning of health exists, meaning that as educational attainment increases, health improves, and this pattern can be seen regardless of the health domain, whether it is chronic disease,[33] mortality,[34] or mental, oral, or physical self-rated health (SRH).[35-37]

Many possible mechanisms can potentially explain the relative disadvantage of non-white compared to white individuals in gaining tangible health outcomes from their educational attainment and other SES indicators. Racism and discrimination have been proposed as a reason behind these differential gains.[38-41] Racial and ethnic minority individuals report more not less discrimination as their SES improves,[38-40,42,43] and discrimination limits the health gains that follow access to SES resources.[4,5] Other potential mechanisms include residential segregation, which may contribute to lowering the gains of the very same educational attainment for minority groups compared to whites. Differential treatment by the society can also cause diminished returns of SES for non-whites.[4,5] For example, highly educated minorities are at a higher risk of poverty and unemployment compared to similarly educated whites.[7,44-46]

Still, most of what we know about these diminished returns are derived from comparison of blacks and whites,[4,5] leaving a gap to be filled on how the same patterns can be observed for other ethnic groups, such as Hispanics.[47] As some of the Hispanic groups, such as Mexican Americans, experience considerable economic adversities in the United States, we may expect a smaller effect of educational attainment on their physical SRH. Some studies have shown that education, employment, and income better enhance the health status of non-Hispanic whites compared to Hispanics[47-49]; however, none of these studies has been conducted on older adults.

To fill such a gap, this study aimed to compare Hispanic and non-Hispanic white older Americans for the effect of high educational attainment on physical SRH. Guided by theoretical[4,5] and empirical work[14,50,51] that suggests health gains from SES are systemically smaller for racial and ethnic minorities compared to non-Hispanic whites, we expected a weaker protective effect of high educational attainment level against poor physical SRH for Hispanic whites relative to non-Hispanic whites.

2 | METHODS

2.1 | Design and setting

Using a cross-sectional design, this study used data from the first wave of the University of Michigan (UM) National Poll on Healthy Aging (NPHA), which is an online survey of older adults in the United States. The UM-NPHA (available upon request) was conducted by the University of Michigan Institute for Healthcare Policy and Innovation to monitor the trends of the health of older adults in the United States.

2.2 | NPHA 2017

The NPHA is built on the Knowledge Networks (GFK Knowledge Panel), an online Internet panel that is nationally representative of US adults aged 50-80 years. The UM-NPHA has gathered data on the health and well-being of Americans who are 50 years or older. Using random sampling, the UM-NPHA provides an opportunity to study the intersections of race, gender, and class on the health of older adults in the United States. The main objective of the study is to collect data on perceptions and experiences associated with ageing in the United States.

2.3 | Analytical sample

The current study included 1820 older adults who were 50 years or older (1618 non-Hispanic whites and 202 Hispanic whites). The exclusion criteria for this study were age younger than 50 years and being of any racial or ethnic background other than Hispanic or non-Hispanic white.

2.4 | Ethics

The UM Institutional Review Board found the NPHA study to be "exempt" from a full review. All participants provided informed consent.

2.5 | Study measures

Study variables included age, gender, ethnicity, marital status, employment, and physical SRH.

2.5.1 | Independent variable

Educational attainment

Educational attainment was measured as an interval variable ranging from 1 to 14. The levels included: (1) no formal education; (2) 1st, 2nd, 3rd, or 4th grade; (3) 5th or 6th grade; (4) 7th or 8th grade; (5) 9th grade; (6) 10th grade; (7) 11th grade; (8) 12th grade but no diploma; (9) school graduate—high school diploma; (10) some college, no degree; (11) associate degree; (12) bachelor's degree; (13) master's degree; and (14) professional or doctorate degree. A higher score reflected more educational attainment.

2.5.2 | Dependent variable

Physical self-rated health

Physical SRH was measured with a single-item, with a five-category response scale. Participants were asked to rate their overall physical health as either: *excellent*, *very good*, *good*, *fair*, or *poor*.[52-54] Poor SRH was treated as a numerical variable, ranging from 1 to 5, with a higher score indicating a worse SRH.[55] The Institute of Medicine has advocated for routine application of single-item SRH measure for monitoring the health of US citizens.[53] Poor SRH has shown high validity, as it is a strong predictor of mortality risk beyond all other traditional risk factors.[56-59]

2.5.3 | Covariates

Sociodemographic variables

Gender, age (years), employment, and marital status were the study covariates. Age was an interval variable, measured in years. Gender was a dichotomous measure (males 0 [reference group], females 1). Employment was a dichotomous variable (employed 1, not employed 0). Marital status was a dichotomous variable (married 1, not married 0).

2.5.4 | Moderating variable

Ethnicity

Self-identified race/ethnicity was the focal moderating variable. Ethnicity was a dichotomous variable (non-Hispanic white 0 [reference group], Hispanic white 1).

2.6 | Statistical analysis

Data were analyzed using Stata 15.00 (StataCorp., College Station, TX, USA). We reported frequency (%) and mean (standard deviation) to describe our sample overall and also by ethnicity. We used chi-square and independent *t* tests for bivariate analysis. We used four linear regression models: two in the pooled sample and two ethnic-specific models. In all models, (poor) physical SRH was the primary outcome (dependent variable), and educational attainment was the primary predictor (independent variable). Model 1 only had the main effects. Model 2 included the ethnicity by educational attainment interaction term as well. Model 3 and Model 4 tested the effect of educational attainment in non-Hispanic white and Hispanic white older adults, respectively. Regression coefficients, standard errors (SE), 95% confidence intervals (CI), *t*, and *P* values were reported.

3 | RESULTS

3.1 | Descriptive statistics

This study included 1820 older adults who were 50-80 years and were non-Hispanic white (n = 1618) or Hispanic white (n = 202). Hispanic whites had lower educational attainment compared to non-Hispanic whites. Non-Hispanic white older adults reported better physical SRH compared to their Hispanic white counterparts (Table 1).

3.2 | Pooled-sample multivariable models

Table 2 shows the results of two linear regression models, both in the overall sample of older adults. Based on Model 1, which did not include any interaction term to the model, high educational attainment was associated with lower risk of poor physical SRH, independent of age, gender, ethnicity, employment, and marital status. Model 2, which also included the interaction between ethnicity and educational attainment, showed a significant interaction between ethnicity and educational attainment on poor physical SRH, suggesting a smaller effect of educational attainment on SRH for Hispanic white compared to non-Hispanic white older adults.

TABLE 1 Summary of descriptive statistics for the pooled sample and by ethnicity

	All		Non-Hispanic white		Hispanic white	
	n	%	n	%	n	%
Gender						
Male	889	48.85	784	48.45	105	51.98
Female	931	51.15	834	51.55	97	48.02
Marital status*						
Not Married	533	29.29	465	28.74	68	33.66
Married	1287	70.71	1153	71.26	134	66.34
Employment status*						
Unemployed/retired	1077	59.31	967	59.88	110	54.73
Employed	739	40.69	648	40.12	91	45.27
	Mean	SE	Mean	SE	Mean	SE
Age*	64.21	0.19	64.56	0.20	61.44	0.53
Income*	13.07	0.10	13.21	0.11	12.02	0.30
Educational attainment*	10.38	0.05	10.52	0.05	9.28	0.17
Physical self-rated health*	2.71	0.02	2.68	0.02	2.88	0.07

Abbreviations: SE, standard error.
Source: National Poll on Healthy Aging 2017.
*$P < 0.05$.

TABLE 2 Summary of pooled sample linear regression models

	B	SE	95% CI		t	P
Model 1 (main effect model)						
Ethnicity (Hispanic white)	0.02	0.07	−0.11	0.15	0.33	0.744
Gender (female)	−0.08	0.04	−0.16	0.00	−2	0.046
Age (y)	−0.01	0.00	−0.02	−0.01	−3.8	<0.001
Married	−0.03	0.05	−0.12	0.07	−0.6	0.546
Employed	−0.25	0.05	−0.35	−0.16	−5.14	<0.001
Income	−0.04	0.01	−0.05	−0.03	−7.44	<0.001
Educational attainment (0-14)	−0.08	0.01	−0.10	−0.05	−6.31	<0.001
Intercept	4.91	0.23	4.46	5.36	21.53	<0.001
Model 2 (interaction model)						
Ethnicity (Hispanic white)		0.27	−1.23	−0.16	−2.55	0.011
Gender (female)		0.04	−0.17	−0.01	−2.1	0.036
Age (y)		0.00	−0.02	−0.01	−3.81	<0.001
Married	−0.03	0.05	−0.13	0.06	−0.68	0.498
Employed	−0.25	0.05	−0.35	−0.16	−5.18	<0.001
Income	−0.04	0.01	−0.05	−0.03	−7.17	<0.001
Educational attainment (0-14)	−0.09	0.01	−0.12	−0.06	−6.88	<0.001
Educational attainment (0-14) × Ethnicity	0.08	0.03	0.02	0.13	2.71	0.007
Intercept	5.06	0.23	4.60	5.52	21.62	<0.001

Abbreviations: CI, confidence interval; SE, standard error.
Source: National Poll on Healthy Aging 2017.

3.3 | Ethnic-specific multivariable models

Table 3 shows the results of two ethnic-specific linear regression models. Based on Model 3, which was conducted in non-Hispanic white older adults, high educational attainment was associated with lower risk of poor physical SRH, independent of age, gender, ethnicity, marital status, and employment. Based on Model 4, which was performed in Hispanic white older adults, we did not find a significant association between high educational attainment and physical SRH for Hispanic white older adults.

4 | DISCUSSION

Two results were found: First, overall, higher educational attainment protects older adults against risk of poor physical SRH; and second, there are ethnic variations in the magnitude of the association between educational attainment and physical SRH of older adults, with Hispanic whites having a relative disadvantage compared to non-Hispanic whites for gaining physical SRH from their educational attainment.

Income (and quality of jobs) may be one of the main reasons why educational attainment shows a stronger association with health outcomes for majority than minority groups. A recent study[60] among blacks suggested that there might be an economic explanation for blacks' diminished returns of educational attainment on SRH compared to whites. The study showed that income mediates the ethnicity by education interaction effect, suggesting that labor market discrimination may be one reason explaining why black individuals gain far less SRH benefits than white individuals from their educational attainment.[60] By showing that income is the mediator, that study showed that it is institutional discrimination in the labor market, not minorities' cultures or behaviors, that causes diminished returns. Although many factors, such as interpersonal discrimination, racism, and segregation, may also play a role, the results suggest that ethnic minorities should not be blamed because of their poor outcomes, as the society is responsible for the differential effects of education attainment on income by ethnicity.

Although this is not the first study to document minorities' diminished returns of educational attainment on health,[4,5,60] it is probably the first to show the same pattern for Hispanic white older adults. Most of the previous studies are conducted on comparison of blacks and whites, showing that black people are at a relative disadvantage compared to their white counterparts in translating their economic and human resources to tangible health outcomes. Although the same patterns are shown for mental and physical health domains,[61-65] we know very little about these patterns for Hispanics.[48,49] Review papers of studies built on the minorities' diminished returns theory have not included any papers on Hispanics or Hispanic whites.[4,5]

TABLE 3 Summary of ethnic-specific linear regression models

	B	SE	95% CI		t	P
Model 3 (non-Hispanic white)						
Gender (female)	−0.11	0.04	−0.19	−0.02	−2.50	0.013
Age (y)	−0.01	0.00	−0.02	0.00	−3.06	0.002
Married	−0.01	0.05	−0.11	0.09	−0.22	0.826
Employed	−0.20	0.05	−0.31	−0.10	−3.97	<0.001
Income	−0.04	0.01	−0.05	−0.03	−7.33	<0.001
Educational attainment (0-14)	−0.09	0.01	−0.12	−0.06	−6.79	<0.001
Intercept	4.95	0.24	4.48	5.43	20.46	<0.001
Model 4 (Hispanic white)						
Gender (female)	0.11	0.13	−0.15	0.36	0.8	0.423
Age (y)	−0.02	0.01	−0.04	−0.01	−2.53	0.012
Married	−0.14	0.15	−0.44	0.16	−0.93	0.352
Employed	−0.59	0.15	−0.88	−0.30	−4.07	<0.001
Income	−0.02	0.02	−0.05	0.02	−0.9	0.371
Educational attainment (0-14)	−0.02	0.03	−0.07	0.04	−0.65	0.515
Intercept	5.03	0.66	3.72	6.33	7.59	<0.001

Abbreviations: CI, confidence interval; SE, standard error.
Source: National Poll on Healthy Aging 2017.

Educational attainment and other SES indicators better promote general,[6,66] mental,[67] and oral[47] self-rated health for whites than racial and ethnic minorities. Similarly, income better reduces number of chronic condition[14] and depression[68] for whites than minority groups. Among blacks, highly educated individuals may be at an increased risk of mental health problems.[17,38,40] Although the exact causes are unknown, differential treatment by the society can cause educational attainment to show stronger effects on income and purchasing power for non-Hispanic whites than for ethnic minority groups. Other suspects include structural factors, such as residential segregation, concentration of poverty, crime, and other social disorders that may reduce non-whites' abilities to access and use their resources. For example, high education may better promote access to healthy food choices for whites; however, with the same educational attainment, non-whites have lower purchasing power, so their social class is not as protective as that of whites.[69]

4.1 | Implications

To minimize the diminished returns of non-Hispanic whites, we need to eliminate racism and discrimination across institutions, such as the education system, labor market, and health-care system. We need to improve the economic lives of race and ethnic groups so all groups can enjoy the same health levels as non-Hispanic whites. For example, highly educated Hispanic whites should be given the very same opportunities in the labor market so they can obtain similar occupations and pay. Programs should also help highly educated minorities to compete with their white counterparts to secure low-stress high-paying jobs.

4.2 | Limitations

This study has its own limitations. First, with a cross-sectional design, causal associations should not be inferred from our results. As SES and health have bidirectional associations and poor health also causes downward social mobility,[70,71] reverse causality cannot be ruled out. Future research may operationalize physical SRH and SES as time-varying factors to observe how racial groups differ in these effects over the life course. We should also consider the possibility of residual confounding. Several factors, such as higher-level SES and access to and use of health care, may confound the associations between individual SES and SRH. This study only focused on educational attainment and other SES indicators, such as occupation and wealth, were not measured. Differential validity of SRH by ethnicity may be a threat to the validity of this study. Some research has shown that poor SRH reflects different aspects of health for various ethnic groups.[72] In addition, the sample size was not equal between Hispanic and non-Hispanic whites. Lower sample size of ethnic minorities, however, is a common feature of similar studies. Finally, there is a need to conduct research on contextual factors, such as density of racial groups, resources, and crime, which may help us understand why the very same resources do not generate the very same outcomes for different ethnic groups.[73-75]

5 | CONCLUSIONS

Although higher educational attainment is associated with better physical SRH among older adults, the magnitude of this association

is a function of ethnic group membership. That is, at each educational attainment, non-Hispanic whites maintain better health than Hispanic whites. We need innovative social and economic policies and programs that can reduce minorities' diminished returns of SES resources, particularly educational attainment.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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