



High Economic Stress May Explain Worse-Than-Expected Health of Highly Educated Chinese Americans

Shervin Assari^{1,2*} ¹School of Nursing, Charles R. Drew University of Medicine and Science, Los Angeles, CA 90059, USA²Department of Family Medicine, College of Medicine, Charles R. Drew University of Medicine and Science, Los Angeles, CA 90059, USA**Corresponding Author:** Shervin Assari, MD, MPH, Associate Professor, Department of Family Medicine, Charles R. Drew University of Medicine and Science, Los Angeles, CA 90059, USA. Tel: +1-734-363-2678, Email: assari@umich.edu

Received September 19, 2021; Accepted November 29, 2021; Online Published December 4, 2021

Abstract

Introduction: Low stress is one of many plausible mechanisms that may explain the health effects of educational attainment. However, *Marginalization-related Diminished Returns (MDRs)* refer to the weaker health effects of educational attainment for marginalized, compared to privileged, groups. We are unaware of any previous studies that have compared Asian and non-Hispanic White Americans for the effects of educational attainment on perceived economic stress. The aim was to compare Chinese and non-Hispanic White Americans for the association between educational attainment and perceived economic stress in a national sample of American adults. This is important given stress is a risk factor for poor health.

Methods: This study analyzed cross-sectional data of 20,793 adults who participated in the National Health Interview Survey (NHIS 2015). From all participants, 403 individuals were Chinese Americans, and 20,390 were non-Hispanic Whites. Perceived economic stress was the outcome of interest. Years of education (educational attainment) was the predictor variable of interest. Gender, age, region, marital status, sexual orientation (i.e., lesbian, gay, bisexual, and transgender (LGBT)), and immigration status were covariates. Race/ethnicity was the effect modifier.

Results: Overall, higher educational attainment was associated with lower levels of perceived economic stress. A statistically significant interaction showed that the effect of educational attainment on reducing perceived economic stress is smaller for Chinese Americans than Non-Hispanic Whites.

Conclusion: Educational attainment is not similarly protective against perceived economic stress across all social groups. Thus, perceived economic stress may explain why ethnic minorities and immigrants gain decreased benefits from their educational attainment than the mainstream and privileged social group.

Keywords: Socioeconomic Status, Stress, Perceived Economic Stress, Population Groups

Citation: Assari S. High economic stress may explain worse-than-expected health of highly educated Chinese Americans. Int J Travel Med Glob Health. 2021;9(4):183-190. doi:10.34172/ijtmgh.2021.30.

Introduction

According to the extensive work by Marmot,¹⁻³ Ross and Mirowsky,^{4,5} and Link and Phelan^{6,7} on social determinants of health (SDoH),¹⁻³ socioeconomic status (SES),^{4,5} the social gradient of health,^{1-3,8} and fundamental cause^{6,7} frameworks, educational attainment is among the strongest determinants of health. According to the Marginalization-related Diminished Returns theory (MDRs),⁹⁻¹³ some of the health disparities are due to “weaker than expected” real-life effects of socioeconomic position (SEP) indicators in the lives of socially marginalized, compared to privileged, groups.^{9,14-16} The MDRs framework suggests that: (a) racial disparities are not all due to lower SEP of marginalized groups, but are also because of the lower impact of available SEP resources on their lives, (b) health inequalities may widen rather than narrow at high SEP levels, and (c) health disparities should

be addressed across all SEP levels, as such inequalities may extend to middle-class people as well.⁹⁻¹¹

Research has well established a wide range of MDRs for economic,^{9,15,17} behavioral,¹⁸⁻²⁰ physical,²¹⁻²⁴ and mental^{25,26} health outcomes. However, this research is mainly done in non-Hispanic Whites, Blacks, and Hispanics. Evidence shows that high SEP Blacks and Hispanics report worse health outcomes across domains than high SEP non-Hispanic Whites.^{18,25,27,28} In other studies, educational attainment better reduced environmental exposures to environmental pollutants for non-Hispanic Whites than non-Hispanic Blacks.²⁹ Very few investigations, however, have explored MDRs of educational attainment on perceived stress. In a recent study, education better reduced work-related stress for non-Hispanic Whites than non-Hispanic Blacks.³⁰ In another study, educational mobility altered exposure to stress for non-

Hispanic Whites but not for non-Hispanic Blacks.¹⁷ Other studies have shown a high level of perceived discrimination in high SEP Blacks.^{13,31-35} That said, these MDRs have never been tested for Asian Americans, such as Chinese Americans.

The US labor market, being a dual system, is why highly educated ethnic minority individuals may perceive higher stress levels than non-Hispanic Whites.³⁰ The dual system labor market suggests that some jobs are low stress, high pay, and prestigious. On the other hand, some jobs are low pay, stressful, and demanding. Similar to other sectors of society, the US labor market also discriminates against racial and ethnic minorities and immigrants. As a result, ethnic minorities and immigrants are employed in lower-tier jobs that are low pay and more stressful.^{22,36} The literature supports this, showing that identical resumes generate unequal job interviews for racial and ethnic minority applicants.³⁷ As a result, highly educated racial and ethnic minorities and immigrants fight an uphill battle to overcome the glaring difficulties of securing high-paying, low-stress jobs. Because of this, highly educated racial and ethnic minorities are more likely to work in low-quality jobs that are high in stress and environmental exposures, and have low benefits.^{29,36} In addition to the systemic discrimination in the labor market, job proximity and variability are low for racial and ethnic minorities due to residential segregation. Ethnic enclaves and residential segregation also increase the stress of racial and ethnic minorities, as they are more likely to reside in neighborhoods with limited resources and poor job opportunities. Thus, highly educated racial and ethnic minorities may have a lower likelihood of accessing occupational opportunities, even if the labor market does not discriminate against them.^{29,36} Finally, as education quality is lower in urban areas, some racial and ethnic minority groups, particularly Blacks and Hispanics, may receive lower education quality. This may also result in differential effects of educational attainment on occupational quality of highly educated Blacks and Hispanics, compared to Asian Americans and non-Hispanic Whites. All these suggest that educational attainment may generate better health for Whites, and poorer health for immigrants as well as racial and ethnic minorities.^{9,14,15,29,38} However, these patterns may be less pronounced for Asian Americans than Latinos and Hispanics.

Some research suggests that stress may be a mechanism showing that educational attainment and SEP do not generate the same health outcomes for social groups.^{31,39-41} However, most of this literature focused on racial and ethnic discrimination rather than economic stress.^{31,39-41} A few studies showed that highly educated racial and ethnic minorities are in closer proximity to non-Hispanic Whites, which may increase their perceived discrimination.^{31,39-41} These processes, however, may be more relevant to Blacks than Asian Americans. Thus, high SEP may differently increase exposure to general stress, race/ethnicity-related stress, and economic stress.³² These studies, however, focused on race/ethnicity-related stress; they are more relevant to the comparison of non-Hispanic Blacks and non-Hispanic Whites. As such, there is a need to study how other forms of stress, such as perceived economic stress, follow the gradient

of educational attainment in Asian Americans and non-Hispanic Whites.

To extend the existing literature on the contribution of various types of stress as an explanation for worse-than-expected health of racial and ethnic minorities and immigrant people in the US, we performed a secondary analysis of existing data to explore how Chinese and White Americans differ in the effects of educational attainment on perceived economic stress in the US. We expected an inverse association between educational attainment and perceived economic stress overall (Hypothesis 1). However, we hypothesized that this association would be weaker for Chinese Americans than non-Hispanic Whites (Hypothesis 2).

Methods

Design and Settings

This study is a secondary analysis of the 2015 NHIS data, which is one of the primary national health surveys of American residents. The NHIS is funded and performed by the Centers for Disease Control and Prevention (CDC).⁴²

NHIS Sample

The NHIS sample was composed of American adults who were civilian, non-institutionalized, US residents, and at least 18 years old. The NHIS used a multistage sampling strategy that involved clustering and stratification in generating a probability sample of US households. Although the NHIS 2015 included 33,672 American adults, this analysis was limited to 20,793 adults who were either non-Hispanic White or Chinese Americans.

Study Variables

Variables included demographic characteristics, race/ethnicity, educational attainment (SEP), region, marital status, sexual orientation (i.e., LGBT), immigration status, and perceived economic stress, which were all measured at an individual level. *Race/ethnicity* was self-identified and included Chinese Americans versus non-Hispanic Whites. *Demographic characteristics* included age (years) and gender (male 1, female 0). The number of jobs was a continuous variable. Participants were asked if they were working more than one job. *Educational attainment*, a continuous measure ranging between 0 and 24 years, was the independent variable. *Marital status* was 1) married versus non-married (i.e., never married, separated, divorced, widowed, and living with a partner). *Region* was coded as 1) northeast, 2) Midwest, 3) south, and 4) west (reference group). *Sexual orientation status* was a dichotomous variable. *Immigration status* was self-identified and dichotomous.

Perceived economic stress, the outcome of this study, was measured using the following items: "How worried are you about..." 1) money for retirement, 2) medical costs of illness/accident, 3) maintaining a standard of living, 4) costs of healthcare, 5) paying for children's college, 6) paying monthly bills, 7) paying rent/mortgage/housing costs, and 8) credit card payments. Item responses were on a 1 to 5 scale, with 5 showing worse stress on each item. We calculated an average

of all the above items. Our overall perceived economic stress score ranged from 1 to 5, with a score of 5 for the highest possible perceived economic stress, and a score of 1 for no perceived economic stress in any domain (Cronbach alpha = 0.925).

Data Analytical Plan

Applying SPSS 23.0 enabled us to accommodate the NHIS survey weights. After we examined the distribution of our variables and used the Pearson correlation test to measure unadjusted (univariate) correlations between the study variables, we tested the assumptions and requirements of multivariable modeling. Our data met the requirements such as near to normal distribution of errors and lack of collinearity between our independent variable and our confounders. We fitted four linear regression models. Two of our models were ran in the pooled sample without and with interaction terms between race/ethnicity and educational attainment. We ran the two other models specific to Chinese Americans and non-Hispanic Whites.

Results

Descriptive Statistics

Table 1 provides a descriptive summary of the participants' characteristics. Out of the 20,793 American adults who participated, most were non-Hispanic Whites (n = 20,390, 98.1%). Only a minority were Chinese Americans (n = 403,

1.9%). The mean age of our participants was 52.11 (SD = 18.53) years, which was considerably lower for Chinese Americans than White Americans. On the other hand, the mean educational attainment of the participants was 15.68 years (SD = 2.75 years), which was considerably higher for Chinese Americans than White Americans.

Bivariate Analysis

Table 2 provides a summary of unadjusted bivariate correlations between all the study variables. There were negative correlations between race/ethnicity (Chinese American) with perceived economic stress. Age, educational attainment, marital status, LGBT status, but not immigration status, were correlated with perceived economic stress (Table 2).

Multivariable Analysis

Table 3 shows the summary of the results of two linear regression models with educational attainment as the independent variable, and perceived economic stress as the dependent variable. These models were run in the overall sample. Model 1 focused on the main effect of educational attainment, race, and covariates. Model 2 had those variables in addition to interaction terms between race and educational attainment. Based on Model 1, high educational attainment reduced perceived economic stress. However, based on Model 2, this effect was weaker for Chinese Americans than non-Hispanic Whites (Table 3).

Table 1. Descriptive Statistics

	All		Non-Hispanic Whites		Chinese Americans	
	No.	%	No.	%	No.	%
Race/Ethnicity						
Non-Hispanic Whites	20390	98.1	20390	100.00	-	-
Chinese Americans	403	1.9	-	-	403	100.00
Gender						
Female	11211	53.9	10997	53.9	214	53.1
Male	9582	46.1	9393	46.1	189	46.9
Region*						
Northeast	3723	17.9	3633	17.8	90	22.3
Midwest	5397	26.0	5343	26.2	54	13.4
South	6268	30.1	6218	30.5	50	12.4
Married*						
Female	10871	52.3	10674	52.3	197	48.9
Male	9922	47.7	9716	47.7	206	51.1
Lesbian, gay, bisexual, and transgender (LGBT)						
No	20139	96.9	19746	96.8	393	97.5
Yes	654	3.1	644	3.2	10	2.5
Immigrants*						
No	19608	94.3	19506	95.7	102	25.3
Yes	1185	5.7	884	4.3	301	74.7
	Mean	SD	Mean	SD	Mean	SD
Age*	52.11	18.53	52.29	18.49	43.05	18.23
Educational attainment*	15.68	2.75	15.66	2.73	16.60	3.37
Perceived economic stress*	1.92	.83	1.93	.83	1.82	.71

* $P < 0.05$.

Table 2. Bivariate Correlations

	1	2	3	4	5	6	7	8	9	10	11
1 Race/Ethnicity (Chinese American)	1	0.002	-0.005	0.016*	-0.040**	-0.054**	0.010	0.418**	-0.069**	0.047**	-0.018*
2 Gender (male)		1	-0.004	-0.011	0.005	-0.023**	0.047**	-0.008	-0.050**	-0.003	-0.074**
3 LGBT			1	0.009	-0.023**	0.002	-0.100**	-0.010	-0.080**	0.044**	0.026**
4 Region – Northeast				1	-0.277**	-0.307**	-0.005	0.053**	0.041**	0.026**	0.019**
5 Region – Midwest					1	-0.389**	-0.016*	-0.049**	-0.020**	-0.042**	-0.024**
6 Region – South						1	0.018*	-0.033**	-0.002	-0.033**	0.009
7 Married							1	0.026**	0.041**	0.126**	-0.038**
Immigrants								1	-0.026**	0.046**	0.013
8 Age									1	-0.132**	-0.172**
9 Educational attainment										1	-0.095**
10 Perceived economic stress											1

* $P < 0.05$, ** $P < 0.01$.**Table 3.** Two Linear Regressions With Perceived Economic Stress as the Outcome

	Beta	B	SE	95% CI		t	P
				Lower Bound	Upper Bound		
Model 1 (Main Effects)							
Race/Ethnicity (Chinese Americans)	-0.04	-0.22	0.04	-0.31	-0.13	-4.92	<.001
Gender (male)	-0.08	-0.14	0.01	-0.16	-0.12	-12.21	<0.001
Sexual orientation (LGBT)	0.01	0.07	0.03	0.00	0.13	2.03	0.042
Region							
West							
Northeast	0.02	0.04	0.02	0.01	0.07	2.39	.017
Midwest	-0.03	-0.06	0.02	-0.09	-0.03	-3.58	<0.001
South	0.00	-0.01	0.02	-0.04	0.02	-0.50	0.618
Marital status (married)	-0.01	-0.02	0.01	-0.04	0.00	-1.59	0.112
Immigrant	0.03	0.09	0.03	0.04	0.14	3.41	0.001
Age	-0.19	-0.01	0.00	-0.01	-0.01	-28.18	<0.001
Educational attainment (years)	-0.12	-0.04	0.00	-0.04	-0.03	-17.65	<0.001
Constant		3.03	0.04	2.95	3.11	75.00	<0.001
Model 2 (M1 + Interactions)							
Race / Ethnicity (Chinese Americans)	-0.10	-0.62	0.21	-1.03	-0.22	-3.00	0.003
Gender (Male)	-0.08	-0.14	0.01	-0.16	-0.12	-12.23	<0.001
Sexual orientation (LGBT)	0.01	0.07	0.03	0.00	0.13	2.05	0.040
Region							
West							
Northeast	0.02	0.04	0.02	0.01	0.08	2.41	0.016
Midwest	-0.03	-0.06	0.02	-0.09	-0.03	-3.62	<0.001
South	0.00	-0.01	0.02	-0.04	0.02	-0.53	0.596
Marital status (married)	-0.01	-0.02	0.01	-0.04	0.00	-1.54	0.123
Immigrant	0.03	0.09	0.03	0.04	0.14	3.47	0.001
Age	-0.19	-0.01	0.00	-0.01	-0.01	-28.16	<0.001
Educational attainment (years)	-0.12	-0.04	0.00	-0.04	-0.03	-17.73	<0.001
Educational attainment (years) x Race/Ethnicity	0.07	0.02	0.01	0.00	0.05	1.98	0.048
Constant		3.05	0.04	2.97	3.13	74.56	<0.001

CI, confidence interval; SE, standard error.

Multivariable Analysis

Table 4 shows a summary of the results of two linear regression models specific to each racial group. Both models had educational attainment as the independent variable, and perceived economic stress as the dependent variable. These models were identical to each other. Model 3 and Model 2 both showed protective effects of educational attainment on perceived economic stress of non-Hispanic Whites but not Chinese Americans (Table 4).

Discussion

The aim of this study was to compare Chinese and White Americans for the association between educational attainment and economic stress. We found that highly educated Chinese Americans still experience higher levels of economic stress that is disproportionate to their educational attainment. While high educational attainment is generally associated with lower levels of perceived economic stress, this gain is smaller for Chinese Americans than non-Hispanic Whites. This finding has major health implications, as stress is a major determinant of populations' health.

High levels of stress in highly educated racial and ethnic minorities and immigrants may explain why educational

attainment shows smaller protective effects on the health and well-being of racial and ethnic minorities and immigrants compared to non-Hispanic Whites. The MDRs literature has shown that educational attainment, employment, marital status, and income have a weaker impact on reducing the risk of poor health, depression, anxiety, smoking, alcohol use, obesity, chronic disease, and mortality for racial and ethnic minorities.^{18,25,43,44} Note that most of this literature focused on the comparison between non-Hispanic Blacks and non-Hispanic Whites. According to this literature, highly educated racial and ethnic minorities, particularly non-Hispanic Blacks, are more depressed,^{26,45} more anxious,⁴⁶ more suicidal,⁴⁷ and use more illicit substances such as tobacco¹⁸ and alcohol.⁴³ They are also more likely to be obese,²¹ have more CMCs,⁴⁸ report worse health,^{36,49} and die earlier⁵⁰ compared to non-Hispanic Whites with high education. That said, these patterns may not be specific to non-Hispanic Blacks and Latinos. The current study's results suggests that similar patterns can also be seen for Asian Americans. In particular, highly educated Chinese Americans still face stressors that are expected to be less common for them.

High educational attainment may be more related to generational cohorts among non-Hispanic Whites than

Table 4. Two Race/Ethnicity-Specific Linear Regressions With Perceived Economic Stress as the Outcome

	Beta	B	SE	95% CI		t	P
				Lower Bound	Upper Bound		
Model 3 (non-Hispanic Whites)							
Gender (male)	-0.08	-0.14	0.01	-0.16	-0.12	-12.29	<0.001
Sexual orientation (LGBT)	0.01	0.06	0.03	0.00	0.13	1.94	0.053
Region							
West							
Northeast	0.02	0.04	0.02	0.01	0.08	2.46	0.014
Midwest	-0.03	-0.05	0.02	-0.08	-0.02	-3.28	0.001
South	0.00	0.00	0.02	-0.03	0.03	-0.20	0.845
Marital status (married)	-0.01	-0.02	0.01	-0.05	0.00	-2.09	0.036
Immigrant	0.02	0.10	0.03	0.04	0.15	3.42	0.001
Age	-0.20	-0.01	0.00	-0.01	-0.01	-28.53	<0.001
Educational attainment (years)	-0.12	-0.04	0.00	-0.04	-0.03	-17.68	<0.001
Constant		3.04	0.04	2.96	3.12	74.59	<0.001
Model 4 (Chinese Americans)							
Gender (male)	0.00	0.00	0.07	-0.15	0.14	-0.07	0.947
Sexual orientation (LGBT)	0.03	0.13	0.23	-0.32	0.58	0.57	0.570
Region							
West							
Northeast	0.03	0.05	0.09	-0.13	0.23	0.54	0.590
Midwest	-0.09	-0.19	0.12	-0.42	0.04	-1.64	0.101
South	-0.10	-0.21	0.12	-0.44	0.02	-1.80	0.073
Marital status (married)	0.15	0.21	0.08	0.06	0.36	2.76	0.006
Immigrant	0.03	0.05	0.09	-0.12	0.22	0.54	0.591
Age	0.01	0.00	0.00	0.00	0.00	0.16	0.874
Educational attainment (years)	0.01	0.00	0.01	-0.02	0.02	0.16	0.876
Constant		1.68	0.24	1.20	2.15	6.94	<0.001

CI, confidence interval; SE, standard error.

among Chinese Americans.⁵¹ This generational distribution of education and class may contribute to the weaker protective effects of educational attainment against economic stress for Chinese Americans than non-Hispanic Whites. Chinese Americans may be newer to higher SEP classes than non-Hispanic Whites. Being new to the middle-class may reduce the economic advantage of the class and, instead, require more generational time to decrease total economic stress. In comparison, historically, Whites in America may have accrued more generational wealth than other minority groups who may have ancestral immigration, or experiences of discrimination and unequal opportunities.

A relevant observation was that racial and ethnic minorities might be more likely to experience high levels of stress, regardless of their social mobility. For non-Hispanic Whites, however, stress is a function of social mobility.¹⁷ Another study also showed that education better reduces occupational stress for non-Hispanic Whites than racial and ethnic minorities.⁵² Other studies have shown that racial and ethnic minorities may experience high levels of mental distress in highly educated and high-income levels.⁴⁹ Comparative research focused on stress levels between Whites and minority groups at all income levels may be needed to assess the impact on their health.

The work conducted by many scholars can help us understand the MDRs. Farmer and Ferraro published on MDRs of educational attainment on self-rated health.¹² Shapiro and Oliver have published on wealth inequalities as a consequence of unfair social policies such as redlining.⁵³ In the same line, Hamilton and Darity have conducted extensive research on the racial and ethnic wealth gap in the United States.⁵⁴ Other scholars have also published on MDRs.⁵⁵ For example, Hudson has shown reduced health returns of SEP for racial and ethnic minorities than Whites.^{13,34} In a recent study by Wilson, Thorpe, and LaVeist, income better reduced discrimination for non-Hispanic Whites than racial and ethnic minorities.⁵⁶ Navarro has published multiple papers on that it is race/ethnicity *and* class, not race/ethnicity *or* class (SEP), that shapes peoples' life conditions.⁵⁷

We argue that highly educated non-Whites are more likely to work in low-pay and higher-stress jobs than non-Hispanic Whites. We suggest that for non-Hispanic Whites, job stress and job pay are a function of educational attainment. The salience of education on job stress and job pay may be less for non-Whites. That is, although highly educated Whites experience the lowest levels of economic stress on average, Asian Americans may still experience high economic stress, despite their educational attainment.

Some studies have shown that educational attainment can help non-Hispanic Whites, rather than racial and ethnic minorities, to escape poverty.^{58,59} This means highly educated racial and ethnic minorities may still remain at risk of poverty, a phenomenon not observed for highly educated non-Hispanic Whites.⁵⁸ According to another study, educational income at baseline more strongly impacted future change in income for non-Hispanic Whites than racial and ethnic minorities.⁵⁹

Differential educational attainment effects on social groups' economic well-being may be due to the labor market discrimination against non-Whites. In a recent study, educational attainment more strongly reduced exposure to second-hand cigarette smoke at work for non-Hispanic Whites than racial and ethnic minorities.²⁹ Other studies have shown that, for non-Whites, an increase in educational attainment means higher proximity to Whites, as they are more likely to work in a predominantly White workplace. Such a phenomenon is shown to increase non-Whites' interaction with perceived discrimination.³¹ Thus, educational attainment may show smaller health effects for non-Whites than Whites, as shown by past research.^{9,15,16,18,29,38,47} Similarly, employment provides a greater life expectancy for non-Hispanic Whites than non-Whites.²² As a result, educational attainment,^{9,15,16,18,29,38,47} income,^{21,26,60} and employment^{20,22} bring better health to Whites than racial and ethnic minorities. Extensive work by Hudson,¹³ Neighbors,^{34,61} Kaufman,⁶² Darity,⁵⁴ Hamilton,^{54,63} Oliver,⁶⁴ Shapiro,⁶⁴ Williams,⁶⁵ Fuller Rower,⁵⁵ Steele,⁶⁶ and Chetty,⁶⁷ help us understand why SES shows diminished returns for non-Whites.

Limitations

This study had some methodological limitations. Our cross-sectional design does not allow causal inferences. Thus, we can only discuss correlation, rather than causation, between educational attainment and perceived economic stress. The sample size was imbalanced across race/ethnic groups, with a low *n* in Asian Americans. A large number of relevant SEP indicators such as wealth, parental education, occupational prestige, and higher-level SEP were missing. Finally, this study was limited to individual-level SEP. Future research is needed to study contextual and area-level SEP indicators. Residential and job segregation may have a role in explaining MDRs of education on economic stress. Future research may test if neighborhood disadvantage, similarity index, racial and ethnic composition of the neighborhood, or density of resources in the area can explain these findings. Finally, the NHIS study was conducted in 2015, just following the Great Recession. Sociological studies have shown that people suffered an economic downturn, and not all Americans could fully recover. Despite these limitations, this study still extends the current MDRs literature from a predominantly Black-White comparison to an Asian American-White comparison.

Conclusion

High educational attainment is associated with lower economic stress. However, this protective effect in the US depends on race/ethnicity. For example, while highly educated non-Hispanic Whites experience the lowest levels of economic stress, highly educated Chinese Americans still experience a higher level of such stress. As stress is a major determinant of health, this observation may explain worse-than-expected health of highly-educated immigrants and racial/ethnic minorities in the US.

Research Highlights

What Is Already Known?

Highly-educated immigrants and racial/ethnic minorities have worse-than-expected health status in the US.

What Does This Study Add?

A high level of economic stress may explain why highly-educated immigrants and racial/ethnic minorities have worse-than-expected health status in the US.

Conflict of Interest Disclosures

The author declares no conflict of interest.

Ethical Approval

The NHIS study protocol received approval from the Ethics Review Board of the National Center for Health Statistics, CDC. All NHIS participants signed and provided written informed consent.

Funding/Support

The research reported here was supported by the following National Institutes of Health (NIH) funding: 5S21MD000103, U54CA229974, 54MD008149, R25 MD007610, 2U54MD007598, and U54 TR001627.

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