

DR. SHERVIN ASSARI (Orcid ID : 0000-0002-5054-6250)

Article type : Original Article

Corresponding author mail id:- [assari@umich.edu](mailto:assari@umich.edu)

*Article*

## **Ethnicity, Educational Attainment, and Physical Health of Older Adults in the United States**

**Shervin Assari**<sup>1,2,3,4</sup>

<sup>1</sup> Department of Psychology, University of California, Los Angeles (UCLA), Los Angeles, CA 90095, USA

<sup>2</sup> BRITE Center for Science, Research and Policy, University of California, Los Angeles (UCLA), Los Angeles, CA 90095, USA

<sup>3</sup> Center for Research on Ethnicity, Culture, and Health (CRECH), School of Public Health, University of Michigan, Ann Arbor, MI 48104, USA

<sup>4</sup> Department of Psychiatry, University of Michigan, Ann Arbor, MI 48109, USA

### **Abstract:**

**Background:** Minorities' Diminished Returns (MDR) suggests that socioeconomic status (SES) resources generate less health 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 National Poll on Healthy Aging 2017 included 919 older adults who were 65 years or older (846

**This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1002/AGM2.12050](https://doi.org/10.1002/AGM2.12050)**

This article is protected by copyright. All rights reserved

non-Hispanic Whites and 73 Hispanic Whites). The main independent variable of interest was educational attainment. The main dependent variable of interest was poor physical self-rated health (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 lower odds of poor 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 Hispanic Whites. **Conclusion:** Hispanic Whites gain less physical SRH from their educational attainment.

**Keywords:** race; ethnicity; population groups; Whites; Europeans; Hispanics; Hispanic Whites; Socioeconomic status (SES); subjective health; self-rated health

---

## 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 groups [30,31]. As explained by the Minorities' Diminished Returns (MDR) theory [22–26], racial and ethnic minorities, particularly Blacks, gain less health from their very same SES resources compared to Whites [27–36]. For instance, several SES resources [30,31,36] such as educational attainment [28] and income [25,28,37] is showing stronger correlation with the health of Whites than Blacks.

The literature on the link between SES indicators (e.g. educational attainment and income) and risk of morbidity [1,2,4,5,6] is very rich. Both original [7–15] and review [16] papers have well shown a social gradient exist, meaning that as education increases, health improves, and this pattern can be seen regardless of the health domain, whether it is chronic disease [20], mortality [21], or mental, oral, or physical self-rated health (SRH) [17–19].

Many possible mechanisms can potentially explain the relative disadvantage of non-Whites 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 [38,39,40,41]. Racial and ethnic minority individual report more not less discrimination as their SES improves [38,39,40,89,90], and discrimination limits the health gain that follows access to SES resources [30,31]. Other potential mechanism includes residential segregation and that may contribute to lowering the gain of 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 [30,31]. For example, highly educated minorities are at a higher risk of poverty and unemployment compared to highly educated Whites [23,42–44].

Still, most of what we know about these diminished returns are derived from comparison of Blacks and Whites [30,31], leaving a gap to be filled on how the same patterns can be observed for other ethnic groups such as Hispanics [79]. As some of the Hispanic groups such as Mexican

This article is protected by copyright. All rights reserved

Americans experience considerable economic adversities, we may expect smaller effect of educational attainment on their physical SRH. Some studies have shown that education, employment, and income better enhance health of non-Hispanic White compared to Hispanics [79,91,92], however, none of these studies have been on older adults.

To fill such 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 [30,31] and empirical work that suggests health gains from SES is smaller for racial and ethnic minorities compared to non-Hispanic Whites [32,45,46], 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 1<sup>st</sup> wave of the National Poll on Healthy Aging 2017, which is an online survey of older adults in the United States. The NPHA was conducted by the University of Michigan Institute for Health Policy and Innovation (IHPI) to monitor the trends of the health of older adults in the US.

### *2.2. National Poll on Healthy Aging 2017*

The NPHA is built on the Knowledge Networks (now GFK KnowledgePanel), an online internet panel which is nationally representative of US adults. The NPHA has gathered data on health and wellbeing of Americans who are 50 years or older. Using a random sampling, the NPHA provides an opportunity to study the intersections of race, gender, and class on the health of older adults in the US. Study collects data on demographics, SES, social network, health, and health care use.

### *2.3. Analytical Sample*

The current study included 919 older adults who were 65 years or older (846 non-Hispanic White and 73 Hispanic Whites). The exclusion criteria for this study was age lower than 65 years and being of any racial or ethnic background other than Hispanic or Non-Hispanic White.

### *2.4. Ethics*

The NPHA study protocol was approved by the University of Michigan Ann Arbor Institutional Review Board (IRB). All NPHA 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 varying 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 not diploma, 9) school graduate - high school DIPLOMA, 10) Some college, no degree, 11) Associate degree, 12) Bachelors degree, 13) Masters degree, and 14) Professional or Doctorate degree. A higher score reflected more educational attainment.

### 2.5.2. Dependent Variable

*Physical Self-Rated Health (SRH).* Physical SRH was measured with a single item measure, with five category response scale. Participants were asked to rate their overall physical health as either 1) excellent, 2) very good 3) good, 4) fair, or 5) poor [49-51]. Poor SRH was treated as a numerical variable, ranging from 1 to 5, with a higher score indicating a worse SRH [52]. The Institute of Medicine (IOM) has argued about routine application of single item SRH measure as a reliable tool for monitoring the health of American citizens [50]. Poor SRH has shown high validity, as it is a strong predictor of mortality risk beyond all other traditional risk factors [53-56].

### 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 (the reference group), Hispanic White 1).

## 2.6. Statistical Analysis

Data were analyzed using Stata 15.00. We reported frequency (%) and mean (SD) 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% CI, and p values were reported.

### 3. Results

#### 3.1. Descriptive Statistics

This study included 919 older adults who are 65 years or older (846 non-Hispanic White and 73 Hispanic Whites). Hispanic Whites had lower educational attainment compared to non-Hispanic Whites. Non-Hispanic White older adults less frequently reported poor physical SRH compared to their Hispanic White counterparts. (Table 1)

**Table 1.** Summary of descriptive statistics for the pooled sample and by ethnicity

	All		Non-Hispanic White		Hispanic White	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
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	1,287	70.71	1,153	71.26	134	66.34
Employment Status*						
Unemployed/Retired	1,077	59.31	967	59.88	110	54.73
Employed	739	40.69	648	40.12	91	45.27
	<b>Mean</b>	<b>SE</b>	<b>Mean</b>	<b>SE</b>	<b>Mean</b>	<b>SE</b>
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
Education*	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

**Notes:** Source: National Poll on Healthy Aging 2017. SE: Standard Error. \*  $p < 0.05$

#### 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* that did not include any interaction term to the model, high educational attainment was associated with lower risk of poor health, independent of age, gender, ethnicity, employment, and marital status. *Model 2*, that also included the interaction between ethnicity and educational attainment, showed an interaction between ethnicity and educational attainment on poor physical SRH, suggesting smaller effect of educational attainment on SRH for Hispanic White compared to non-Hispanic White older adults.

**Table 2.** Summary of pooled sample linear regression models

	<b>B</b>	<b>SE</b>	<b>95% CI</b>		<b>t</b>	<b>P</b>
<b>Model 1 (Main Effect Model)</b>						
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 (Years)	-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
<b>Model 2 (Interaction Model)</b>						
Ethnicity (Hispanic White)	-0.70	0.27	-1.23 -0.16		-2.55	0.011
Gender (Female)	-0.09	0.04	-0.17 -0.01		-2.1	0.036
Age (Years)	-0.01	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

**Notes:** Source: National Poll on Healthy Aging 2017. SE: Standard Error.

### 3.2. Ethnic-Specific Multivariable Models

Table 3 shows the results of two ethnic-specific linear regression models. Based on *Model 3* that 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*, that 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.

**Table 3.** Summary of ethnic-specific linear regression models

	<b>B</b>	<b>SE</b>	<b>95% CI</b>		<b>t</b>	<b>P</b>
<b>Model 3 (Non-Hispanic White)</b>						
Gender (Female)	-0.11	0.04	-0.19 -0.02		-2.50	0.013
Age (Years)	-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
<b>Model 4 (Hispanic White)</b>						
Gender (Female)	0.11	0.13	-0.15	0.36	0.8	0.423
Age (Years)	-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

**Notes:** Source: National Poll on Healthy Aging 2017; SE: Standard Error.

#### 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 being in a relative disadvantage compared to non-Hispanic Whites for gaining physical SRH from their educational attainment.

In simple terms, income (and quality of the jobs) may be one of the main reasons why educational attainment shows stronger association with health outcomes for majority than minority people. A recent study [93] among Blacks suggested that there might be economic explanation for Blacks' diminished returns of educational attainment on SRH compared to Whites. The study showed that income mediates the effect of ethnicity by education interaction effect, suggesting that labor market discrimination may one reason explaining why Black individuals gain far less SRH than White individuals from their educational attainment [93]. By showing that income is the mediator, it showed that it is institutional discrimination in labor market, not minorities' culture or behaviors, that cause diminished returns. Although many factors such as discrimination, racism, and segregation may also have role, the results suggested that ethnic minorities should not be blamed because of their poor outcomes, as the society is responsible for 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 [30,31,93], it is probably the first to show the same patterns for Hispanic Whites. Most of the previous studies are conducted on comparison of Blacks and White, 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 [72–76], we know very little about these patterns for

Hispanics [91,92]. Review papers of studies built on the MDR theory did not include any papers on Hispanics or Hispanic Whites [30,31].

Educational attainment and other SES indicators better promote general [22,77], mental [78], and oral [79] self-rated health for Whites than Blacks. Similarly, income better reduces number of chronic conditions [32] and depression [94] for Whites than Blacks. In fact, highly educated Blacks may be at an increased risk of mental health problems [35,38,40]. Although the exact causes are unknown, differential treatment of the society that cause educational attainment have stronger effect of income and purchasing power of Whites than Blacks may have a role. Other suspects include structural factors such as residential segregation, concentration of poverty, crime, and other social disorders that may reduce non-Whites ability to access and use their resources. For example, better education may better promote access to healthy food choices for Whites. That is, with the same educational attainment, non-Whites have lower purchasing power, so their social class is not as protective as Whites [80].

### *Implications*

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

### *Limitations*

This study has its own limitations. First, with a cross-sectional study, causal associations should not be inferred from our results. As SES and health have bidirectional associations and poor health also causes downward social mobility [81,82], 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 can also not rule out 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 employment, marital status, 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 for various ethnic groups [83]. In addition, the sample size was not equal between Whites and Blacks. Lower sample of Blacks compared to Whites, 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 crimes that may help us understand why the very same resources do not generate the very same outcomes for ethnic groups [84–86].

## **5. Conclusions**

This article is protected by copyright. All rights reserved



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. Non-Hispanic Whites always gaining more health than other racial and ethnic groups, and Hispanic Whites are also not exceptions to this rule. We need innovative social and economic policies and programs that can reduce minorities' diminished returns of SES resources particularly educational attainment.

**Acknowledgments:** Shervin Assari is partially supported by the National Institute on Minority Health and Health Disparities (NIMHD) Bridging Research, Innovation, Training and Education Solutions for Minority Health (BRITE Center, 4P60MD006923-05) at UCLA. He is also supported by the D084526-03 (National Institute of Child Health and Human Development; NICHD), CA201415 02 (the National Cancer Institute; NCI; Co-PI = Ritesh Mistry), and DA035811-05 (National Institute on Drug Abuse; NIDA; PI = Marc Zimmerman). Special thanks to Hamid Helmi, Wayne State University, for his help in editing this paper.

**Conflicts of Interest:** The author declares no conflict of interest.

## References

1. Marmot, M.G.; Shipley, M.J. Do socioeconomic differences in mortality persist after retirement? 25 year follow up of civil servants from the first Whitehall study. *Br. Med. J.* **1996**, *313*, 1170–1180.
2. Van Groenou, M.I.B.; Deeg, D.J.; Penninx, B.W. Income differentials in functional disability in old age: Relative risks of onset, recovery, decline, attrition and mortality. *Aging Clin. Exp. Res.* **2003**, *15*, 174–183.
3. Berkman, C.S.; Gurland, B.J. The relationship among income, other socioeconomic indicators, and functional level in older persons. *J. Aging Health* **1998**, *10*, 81–98.
4. Baker, D.P.; Leon, J.; Smith Greenaway, E.G.; Collins, J.; Movit, M. The education effect on population health: A reassessment. *Popul. Dev. Rev.* **2011**, *37*, 307–332.
5. Brodish, P.H.; Massing, M.; Tyroler, H.A. Income inequality and all-cause mortality in the 100 counties of North Carolina. *South Med. J.* **2000**, *93*, 386–391.
6. Herd, P.; Goesling, B.; House, J.S. Socioeconomic position and health: The differential effects of education versus income on the onset versus progression of health problems. *J. Health Soc. Behav.* **2007**, *48*, 223–238.
7. Holzer, C.; Shea, B.; Swanson, J.; Leaf, P.; Myers, J.; George, L.; Weissman, M.; Bednarski, P. The increased risk for specific psychiatric disorders among persons of low socioeconomic status: Evidence from the Epidemiologic Catchment Area Surveys. *Am. J. Soc. Psychiatry* **1986**, *4*, 259–271.
8. Weissman, M.; Bruce, M.; Leaf, P.; Florio, L.; Holzer, C. Affective Disorders. In *Psychiatric Disorders in America*; Robins, K., Reiger, D., Eds.; The Free Press: New York, NY, USA, 1991; pp. 53–80.
9. Reiger, D.; Farmer, M.; Rae, D.; Myers, J.; Kramer, M.; Robins, L.; George, L.; Karno, M.; Locke, B. One-month prevalence of mental disorders in the United States and sociodemographic characteristics: The Epidemiologic Catchment Area study. *Acta Psychiatr. Scand.* **1993**, *88*, 35–47.
10. Alegria, M.; Bijl, R.; Lin, E.; Walters, E.; Kessler, R. Income differences in persons seeking outpatient treatment for mental disorders: A comparison of the United States with Ontario and the Netherlands. *Arch. Gen. Psychiatry* **2000**, *57*, 383–391.
11. Blazer, D.; George, K.; Landerman, R.; Pennybacker, M.; Melville, M.; Woodbury, M.; Manton, K.; Jordan, K.; Locke, B. Psychiatric disorders: A rural/urban comparison. *Arch. Gen. Psychiatry* **1985**, *42*, 651–656.
12. Leaf, P.; Weissman, M.; Myers, J.; Holzer, C.; Tischler, G. Psychosocial risks and correlates of major depression in one United States urban community. In *Mental Disorders in the Community: Progress and Challenge*; Barrett, D., Rose, R., Eds.; The Guilford Press: New York, NY, USA, 1986; pp. 47–66.

13. Bruce, M.; Takeuchi, D.; Leaf, P. Poverty and psychiatric status: Longitudinal evidence from the New Haven Epidemiologic Catchment Area Study. *Arch. Gen. Psychiatry* **1991**, *48*, 470–474.
14. Kessler, R.; Zhao, S.; Blazer, D.; Swartz, M. Prevalence, correlates, and course of minor depression and major depression in the national comorbidity survey. *J. Affect. Disord.* **1997**, *45*, 19–30.
15. Kessler, R.; Berglund, P.; Demler, O.; Jin, R.; Koretz, D.; Merikangas, K.; Rush, J.; Walters, E.; Wang, P. The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *J. Am. Med. Assoc.* **2003**, *289*, 3095–3105.
16. Lorant, V.; Deliege, D.; Eaton, W.; Robert, A.; Philippot, P.; Ansseau, M. Socioeconomic inequalities in depression: A meta-analysis. *Am. J. Epidemiol.* **2003**, *157*, 98–112.
17. Callan, M.J.; Kim, H.; Matthews, W.J. Predicting self-rated mental and physical health: The contributions of subjective socioeconomic status and personal relative deprivation. *Front. Psychol.* **2015**, *6*, 1415, doi:10.3389/fpsyg.2015.01415.
18. Meyer, O.L.; Castro-Schilo, L.; Aguilar-Gaxiola, S. Determinants of mental health and self-rated health: A model of socioeconomic status, neighborhood safety, and physical activity. *Am. J. Public Health* **2014**, *104*, 1734–1741, doi:10.2105/AJPH.2014.302003.
19. Assari, S.; Lankarani, M.M. Demographic and Socioeconomic Determinants of Physical and Mental Self-rated Health across 10 Ethnic Groups in the United States. *Int. J. Epidemiol. Res.* **2017**, *4*, 185–193.
20. Choi, A.I.; Weekley, C.C.; Chen, S.C.; Li, S.; Tamura, M.K.; Norris, K.C.; Shlipak, M.G. Association of educational attainment with chronic disease and mortality: The Kidney Early Evaluation Program (KEEP). *Am. J. Kidney Dis.* **2011**, *58*, 228–234.
21. Gakidou, E.; Cowling, K.; Lozano, R.; Murray, C.J. Increased educational attainment and its effect on child mortality in 175 countries between 1970 and 2009: A systematic analysis. *Lancet* **2010**, *376*, 959–974.
22. Assari, S. Racial Variation in the Association between Educational Attainment and Self-Rated Health. *Societies* **2018**, *8*, 26, doi:10.3390/soc8020026
23. Assari, S.; Preiser, B.; Kelly, M. Education and Income Predict Future Emotional Well-Being of Whites but Not Blacks: A Ten-Year Cohort. *Brain Sci.* **2018**, *8*, 122.
24. Assari, S.; Moghani Lankarani, M. Poverty Status and Childhood Asthma in White and Black Families: National Survey of Children's Health. *Healthcare* **2018**, *6*, 62.
25. Assari, S. Family Income Reduces Risk of Obesity for White but Not Black Children. *Children* **2018**, *5*, 73.
26. Assari, S.; Caldwell, C.H.; Zimmerman, M.A. Family Structure and Subsequent Anxiety Symptoms; Minorities' Diminished Return. *Brain Sci.* **2018**, *8*, 97.
27. Assari, S. Combined racial and gender differences in the long-term predictive role of education on depressive symptoms and chronic medical conditions. *J. Racial Ethn. Health Dispar.* **2016**, *4*, 385–396.
28. Assari, S.; Lankarani, M.M. Race and urbanity alter the protective effect of education but not income on mortality. *Front. Public Health* **2016**, *4*, 100, doi:10.3389/fpubh.2016.00100.
29. Assari, S.; Lankarani, M.M. Education and alcohol consumption among older Americans. Black-White Differences. *Front. Public Health* **2016**, *4*, 67, doi:10.3389/fpubh.2016.00067.
30. Assari, S. Health Disparities Due to Diminished Return among Black Americans: Public Policy Solutions. *Soc. Issues Policy Rev.* **2018**, *12*, 112–145.
31. Assari, S. Unequal gain of equal resources across racial groups. *Int. J. Health Policy Manag.* **2017**, *6*, 1–6, doi:10.15171/ijhpm.2017.902.
32. Assari, S. Life expectancy gain due to employment status depends on race, gender, education, and their intersections. *J. Racial Ethn. Health Dispar.* **2018**, *5*, 375–386, doi:10.1007/s40615-017-0381-x.

33. Assari, S.; Caldwell, C.H. Social Determinants of Perceived Discrimination among Black Youth: Intersection of Ethnicity and Gender. *Children* **2018**, *5*, 24, doi:10.3390/children5020024.
34. Assari, S.; Thomas, A.; Caldwell, C.H.; Mincy, R.B. Blacks' Diminished Health Return of Family Structure and Socioeconomic Status; 15 Years of Follow-up of a National Urban Sample of Youth. *J. Urban Health* **2017**, *95*, 21–35, doi:10.1007/s11524-017-0217-3.
35. Assari, S. Social Determinants of Depression: The Intersections of Race, Gender, and Socioeconomic Status. *Brain Sci.* **2017**, *7*, 156, doi:10.3390/brainsci7120156.
36. Farmer, M.M.; Ferraro, K.F. Are racial disparities in health conditional on socioeconomic status? *Soc. Sci. Med.* **2005**, *60*, 191–204.
37. Assari, S. The Benefits of Higher Income in Protecting against Chronic Medical Conditions Are Smaller for African Americans than Whites. *Healthcare* **2018**, *6*, 2, doi:10.3390/healthcare6010002.
38. Assari, S.; Gibbons, F.X.; Simons, R. Depression among Black Youth; Interaction of Class and Place. *Brain Sci.* **2018**, *8*, 108, doi:10.3390/brainsci8060108.
39. Assari, S.; Gibbons, F.X.; Simons, R.L. Perceived Discrimination among Black Youth: An 18-Year Longitudinal Study. *Behav. Sci. (Basel)* **2018**, *8*, 44, doi:10.3390/bs8050044.
40. Assari, S.; Lankarani, M.M.; Caldwell, C.H. Does Discrimination Explain High Risk of Depression among High-Income African American Men? *Behav. Sci.* **2018**, *8*, 40, doi:10.3390/bs8040040.
41. Assari, S.; Preiser, B.; Lankarani, M.M.; Caldwell, C.H. Subjective Socioeconomic Status Moderates the Association between Discrimination and Depression in African American Youth. *Brain Sci.* **2018**, *8*, 71, doi:10.3390/brainsci8040071.
42. Assari, S.; Thomas, A.; Caldwell, C.H.; Mincy, R.B. Blacks' diminished health return of family structure and socioeconomic status; 15 years of follow-up of a national urban sample of youth. *J. Urban Health* **2018**, *95*, 21–35.
43. Assari, S. Parental Education Better Helps White than Black Families Escape Poverty: National Survey of Children's Health. *Economies* **2018**, *6*, 30.
44. Assari, S. Diminished Economic Return of Socioeconomic Status for Black Families. *Soc. Sci.* **2018**, *7*, 74.
45. Assari, S.; Caldwell, C.H. High Risk of Depression in High-Income African American Boys. *J. Racial Ethn. Health Dispar.* **2018**, *5*, 808–819, doi:10.1007/s40615-017-0426-1.
46. Gavin, A.R.; Walton, E.; Chae, D.H.; Alegria, M.; Jackson, J.S.; Takeuchi, D. The associations between socio-economic status and major depressive disorder among Blacks, Latinos, Asians and non-Hispanic Whites: Findings from the Collaborative Psychiatric Epidemiology Studies. *Psychol. Med.* **2010**, *40*, 51–61, doi:10.1017/S0033291709006023.
47. Hesse, B.W.; Moser, R.P.; Rutten, L.J.; Kreps, G.L. The health information national trends survey: Research from the baseline. *J. Health Commun.* **2006**, *11*, vii–xvi, doi:10.1080/10810730600692553.
48. National Cancer Institute. Health Information National Trends Survey 5 (HINTS 5) Cycle 1 Methodology Report. 2017. Available online: [https://hints.cancer.gov/docs/methodologyreports/HINTS5\\_Cycle\\_1\\_Methodology\\_Rpt.pdf](https://hints.cancer.gov/docs/methodologyreports/HINTS5_Cycle_1_Methodology_Rpt.pdf) (accessed on 1 April 2018).
49. Idler, E.L.; Benyamini, Y. Self-rated health and mortality: A review of twenty-seven community studies. *J. Health Soc. Behav.* **1997**, *38*, 21–37.
50. IOM(Institute of Medicine). State of the USA Health Indicators: Letter Report. 2009. Available online: <http://www.nap.edu/catalog/12534/state-of-the-usa-healthindicators-letter-report> (accessed on 1 April 2018).

51. Abdulrahim, S.; El Asmar, K. Is self-rated health a valid measure to use in social inequities and health research? Evidence from the PAPFAM women's data in six Arab countries. *Int. J. Equity Health* **2012**, *11*, 53.
52. Reichmann, W.M.; Katz, J.N.; Kessler, C.L.; Jordan, J.M.; Losina, E. Determinants of self-reported health status in a population-based sample of persons with radiographic knee osteoarthritis. *Arthritis Rheum.* **2009**, *61*, 1046–1053.
53. Mossey, J.M.; Shapiro, E. Self-rated health: A predictor of mortality among the elderly. *Am. J. Public Health* **1982**, *72*, 800–808.
54. Benyamini, Y.; Idler, E.L. Community studies reporting association between self-rated health and mortality: Additional studies, 1995 to 1998. *Res. Aging*.**1999**, *21*, 392–401.
55. DeSalvo, K.B.; Bloser, N.; Reynolds, K.; He, J.; Muntner, P. Mortality prediction with a single general self-rated health question. A meta-analysis. *J. Gen. Intern. Med.* **2006**, *21*, 267–275.
56. Guimarães, J.M.N.; Chor, D.; Werneck, G.L.; Carvalho, M.S.; Coeli, C.M.; Lopes, C.S.; Faerstein, E. Association between self-rated health and mortality: 10 years follow-up to the Pró-Saúde cohort study. *BMC Public Health* **2012**, *12*, 676.
57. Kline, R.B. Promise and pitfalls of structural equation modeling in gifted research. In *Methodologies for Conducting Research on Giftedness*; Thompson, B., Subotnik, R.F., Eds.; American Psychological Association: Washington, DC, USA, 2010; pp. 147–169.
58. Allison, P.D. *Structural Equation Modeling with Amos: Basic Concepts, Applications, and Programming*, 2nd ed.; Taylor and Francis Group: New York, NY, USA, 2002.
59. Arbuckle, J.L. *Amos 18 User's Guide*; Amos Development Corporation: Chicago, IL, USA, 2009.
60. Hu, G.; Bouchard, C.; Bray, G.A.; Greenway, F.L.; Johnson, W.D.; Newton, R.L.; Ravussin, E.; Ryan, D.H.; Katzmarzyk, P.T. Trunk versus extremity adiposity and cardiometabolic risk factors in white and African American adults. *Diabetes Care* **2011**, *34*, 1415–1418.
61. Lei, M.; Lomax, R.G. The effect of varying degrees of nonnormality in structural equation modeling. *Struct. Equ. Model.* **2005**, *12*, 1–27.
62. Phelan, J.C.; Link, B.G.; Diez-Roux, A.; Kawachi, I.; Levin, B. "Fundamental causes" of social inequalities in mortality: A test of the theory. *J. Health Soc. Behav.* **2004**, *45*, 265–285.
63. Link, B.G.; Northridge, M.E.; Phelan, J.C.; Ganz, M.L. Social epidemiology and the fundamental cause concept: On the structuring of effective cancer screens by socioeconomic status. *Milbank Q.* **1998**, *76*, 375–402.
64. Marmot, M.; Allen, J.J. Social determinants of health equity. *Am. J. Public Health* **2014**, *104*, S517–S519, doi:10.2105/AJPH.2014.302200.
65. Braveman, P.; Gottlieb, L. The social determinants of health: It's time to consider the causes of the causes. *Public Health Rep.* **2014**, *129*, 19–31.
66. Assari, S. Ethnic and Gender Differences in Additive Effects of Socio-economics, Psychiatric Disorders, and Subjective Religiosity on Suicidal Ideation among Blacks. *Int. J. Prev. Med.* **2015**, *6*, 53, doi:10.4103/2008-7802.158913.
67. Rehkopf, D.H.; Buka, S.L. The association between suicide and the socio-economic characteristics of geographical areas: A systematic review. *Psychol. Med.* **2006**, *36*, 145–157.
68. Purselle, D.C.; Heninger, M.; Hanzlick, R.; Garlow, S.J. Differential association of socioeconomic status in ethnic and age-defined suicides. *Psychiatry Res.* **2009**, *167*, 258–265, doi:10.1016/j.psychres.2008.02.003.
69. Goodman, E.; Huang, B. Socioeconomic status, depressive symptoms, and adolescent substance use. *Arch. Pediatr. Adolesc. Med.* **2002**, *156*, 448–453.

70. Lowry, R.; Kann, L.; Collins, J.L.; Kolbe, L.J. The effect of socioeconomic status on chronic disease risk behaviors among US adolescents. *J. Am. Med. Assoc.* **1996**, *276*, 792–797.
71. Ross, C.; Mirowsky, J. *Education, Social Status, and Health (Social Institutions and Social Change)*; Aldine Transaction: Piscataway, NJ, USA, 2003.
72. Hayward, M.D.; Hummer, R.A.; Sasson, I. Trends and group differences in the association between educational attainment and U.S. adult mortality: Implications for understanding education's causal influence. *Soc. Sci. Med.* **2015**, *127*, 8–18.
73. Backlund, E.; Sorlie, P.D.; Johnson, N.J. A comparison of the relationships of education and income with mortality: The national longitudinal mortality study. *Soc. Sci. Med.* **1999**, *49*, 1373–1384.
74. Everett, B.G.; Rehkopf, D.H.; Rogers, R.G. The nonlinear relationship between education and mortality: An examination of cohort, race/ethnic, and gender differences. *Popul. Res. Policy Rev.* **2013**, *32*, 893–917.
75. Cutler, D.M.; Lleras-Muney, A. Education and Health: Evaluating Theories and Evidence. National Bureau of Economic Research. Available online: <http://www.nber.org/papers/w12352/> (accessed on 9 September 2017).
76. Holmes, C.J.; Zajacova, A. Education as “the great equalizer”: Health benefits for black and white adults. *Soc. Sci. Q.* **2014**, *95*, 1064–1085.
77. Assari, S.; Caldwell, C.H.; Mincy, R.B. Maternal Educational Attainment at Birth Promotes Future Self-Rated Health of White but Not Black Youth: A 15-Year Cohort of a National Sample. *J. Clin. Med.* **2018**, *7*, 93, doi:10.3390/jcm7050093.
78. Assari, S.; Lapeyrouse, L.M.; Neighbors, H.W. Income and Self-Rated Mental Health: Diminished Returns for High Income Black Americans. *Behav. Sci.* **2018**, *8*, 50, doi:10.3390/bs8050050.
79. Assari, S. Socioeconomic Status and Self-Rated Oral Health; Diminished Return among Hispanic Whites. *Dent. J.* **2018**, *6*, 11, doi:10.3390/dj6020011.
80. Williams, D.R.; Mohammed, S.A.; Leavell, J.; Collins, C. Race, Socioeconomic Status and Health: Complexities, Ongoing Challenges and Research Opportunities. *Ann. N. Y. Acad. Sci.* **2010**, *1186*, 69–101, doi:10.1111/j.1749-6632.2009.05339.x.
81. Cole, E.R.; Omari, S.R. Race, class and the dilemmas of upward mobility for African Americans. *J. Soc. Issues* **2003**, *59*, 785–802.
82. Parker, S.; Kleiner, R.J. The culture of poverty: An adjustive dimension. *Am. Anthropol.* **1970**, *72*, 516–527.
83. Assari, S.; Dejman, M.; Neighbors, H.W. Ethnic Differences in Separate and Additive Effects of Anxiety and Depression on Self-rated Mental Health Among Blacks. *J. Racial Ethn. Health Dispar.* **2016**, *3*, 423–430, doi:10.1007/s40615-015-0154-3.
84. Short, S.E.; Mollborn, S. Social Determinants and Health Behaviors: Conceptual Frames and Empirical Advances. *Curr. Opin. Psychol.* **2015**, *5*, 78–84.
85. Bécares, L.; Nazroo, J.; Jackson, J. Ethnic density and depressive symptoms among African Americans: Threshold and differential effects across social and demographic subgroups. *Am. J. Public Health* **2014**, *104*, 2334–2341, doi:10.2105/AJPH.2014.302047.
86. Cutrona, C.E.; Wallace, G.; Wesner, K.A. Neighborhood Characteristics and Depression: An Examination of Stress Processes. *Curr. Dir. Psychol. Sci.* **2006**, *15*, 188–192.
87. Smith, Tom W., Hout, Michael, and Marsden, Peter V. General Social Survey, 1972-2016 [Cumulative File]. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], National Opinion Research Center [distributor], **2017**-11-14. <https://doi.org/10.3886/ICPSR36797.v1>
88. Assari, S. Blacks' Diminished Return of Education Attainment on Subjective Health; Mediating Effect of Income. *Brain Sci.* **2018**, *8*, 176.

89. Assari S, Moghani Lankarani M. Workplace Racial Composition Explains High Perceived Discrimination of High Socioeconomic Status African American Men. *Brain Sci.* 2018 Jul 27;8(8). pii: E139. doi: 10.3390/brainsci8080139.
90. Assari S. Does School Racial Composition Explain Why High Income Black Youth Perceive More Discrimination? A Gender Analysis. *Brain Sci.* 2018, 8(8). pii: E140. doi: 10.3390/brainsci8080140.
91. Assari S, Farrokhnia M, Mistry R. Education Attainment and Alcohol Binge Drinking: Diminished Returns of Hispanics in Los Angeles. *Behavioral Sciences.* 2018. In press
92. Assari S, Mistry R. Diminished Return of Employment on Ever Smoking among Hispanic Whites in Los Angeles. *Health Equity.* 2018. In Press
93. Assari, S. Blacks' Diminished Return of Education Attainment on Subjective Health; Mediating Effect of Income. *Brain Sci.* **2018**, 8, 176.
94. Assari, S. High Income Protects Whites but Not African Americans against Risk of Depression. *Healthcare***2018**, 6, 37.

- 1. This paper addresses an important issue concerning discrepancies in health status between different ethnicities with comparable educational attainment, with elderly Hispanic Whites suffering poorer self-rated health than their non-Hispanic counterparts.**
- 2. Although the findings came from the US, geriatricians and policy makers in other parts of the world may encounter similar problems and find the author's insights valuable.**
- 3. There is a huge difference in the numbers of subjects in the groups. The problem is probably inherent with the method used.**
- 4. There are quite a lot of problems with the English language. For example, in the first paragraph of the main text, "is correlated associated with", "at a relative (adverb ?) disadvantaged (noun?) compared to", "particularly Blacks (comma here?) gain", etc.**
- 5. "846 non-Hispanic White; 95.6%, and 73 Hispanic White". Where did "95.6%" come from?**
- 6. The numbering of the references is neither based on the alphabetical order of author names nor on the order of appearance of the references.**