

Economic Strain Deteriorates While Education Fails to Protect Black Older Adults Against Depressive Symptoms, Pain, Self-rated Health, Chronic Disease, and Sick Days

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Abstract

Background: A large body of empirical evidence on Minorities' Diminished Returns (MDRs) suggests that educational attainment shows smaller health effects for Blacks compared to Whites. At the same time, economic strain may operate as a risk factor for a wide range of undesired mental and physical health outcomes in Black communities.

Aim: The current study investigated the combined effects of education and economic strain on the following five health outcomes in Black older adults in underserved areas of South Los Angeles: depressive symptoms, number of chronic diseases, pain intensity, self-rated health, and sick days.

Methods: This cross-sectional study included 619 Black older adults residing in South Los Angeles. Data on demographic factors (age and gender), socioeconomic characteristics, economic strain, health insurance, living arrangement, marital status, health behaviors, depressive symptoms, pain intensity, number of chronic diseases, sick days, and self-rated health were collected. Five linear regressions were used to analyze the data.

Results: Although high education was associated with less economic strain, it was the economic strain, not educational attainment, which was universally associated with depressive symptoms, pain intensity, self-rated health, chronic diseases, and sick days, independent of covariates. Similar patterns emerged for all health outcomes suggesting that the risk associated with economic strain and lack of health gain due to educational attainment are both robust and independent of type of health outcome.

Conclusion: In economically constrained urban environments, economic strain is a more salient social determinant of health of Black older adults than educational attainment. While education loses some of its protective effects, economic strain deteriorates health of Black population across domains. There is a need for bold economic and social policies that increase access of Black communities to cash at times of emergency. There is also a need to improve the education quality in the Black communities.

Background

Socioeconomic status (SES) indicators such as educational attainment and economic strain are among the strongest social determinants of health¹⁻⁵. Link, Phelan, Mirowsky, Ross, Hayward, Williams, and many other prominent scholars have provided empirical and theoretical evidence regarding the protective effects of SES indicators such as education and economic strain on health across cohorts^{1-4,6-15}. Educational attainment is a strong SES indicator and social determinant of health of both young¹⁶ and older adults¹⁷. Low educational attainment is also one of the drivers of racial health disparities¹⁸.

Socioeconomic factors, particularly educational attainment, however, do not similarly impact the health of different racial groups^{11,12,19}. The gradient of the effect of educational attainment on mortality risk may be flatter for Blacks than Whites^{11,12}. Due to discriminatory preferences and practices of the labor market, education levels better translate to high-quality jobs for Whites than Blacks. Thus, Blacks remain at low-status jobs even when they attain a high education^{20,21}. As a result of such discrimination, high educational attainment tends to generate fewer positive health outcomes for Blacks than Whites^{20,22-24}.

Economic strain can be defined as worries related to not having sufficient economic resources to make ends meet, pay the bills, etc. Economic strain reflects an aspect of SES that is not covered by conventional SES indicators such as education and income²⁵. Economic strain may have more significant effects on the health of Black communities²⁵. Economic strain may become particularly detrimental in contexts that are poor in other resources (e.g., economic constraints)²⁵. Previous research has shown that perceived SES, but not education, increases the vulnerability of Blacks to discrimination²⁵. While research shows that High SES may become positively correlated with discrimination and depression for Blacks²⁵⁻²⁸, economic strain becomes a unique marker of SES²⁵. This is because while education increases access to resources, it also increases psychological vulnerability to racism among the Black community²⁸⁻³¹ as people may become more aware of the glass ceiling and inequalities at high SES levels.

Economic strain is probably one of the most essential SES indicators for the Black communities²⁵. In both the general population of older adults^{32,33} and individuals with chronic diseases³⁴, economic strain closely reflects poor health³⁵. Economic strain is linked to poor diet³⁶, smoking³⁷, alcohol use³⁸, suicide³⁹, and depression⁴⁰. Economic strain is a specific type of stress and increases oxidative stress⁴¹. It limits available pro-health behaviors and choices that are needed to maintain one's health³². Economic strain limits access to and use of health care services³². Individuals under great economic strain report poor self-rated health³⁵. Economic strain also increases the risk of various types of chronic diseases⁴², such as heart disease⁴², diabetes³⁴, and cancer^{43,44}. Economic strain also deteriorates disease management³⁴.

Various SES indicators may have joint and unique health implications for racial minorities. As suggested by the Minorities' Diminished Returns (MDRs) theory⁴⁵, education shows smaller health effects for marginalized people such as Blacks^{20-24,46}. That is highly educated Blacks remain at high risk of poor health^{20,24,25,46-49}. Such patterns are observed in Black youth, adults, and older adults. These studies cumulatively suggest that objective SES indicators such as education may have "less than expected" effects on the well-being and health of Black older adults, while

economic strain may have an exacerbated effect for the very same population^{25,51}. However, we are only aware of one study simultaneously comparing the effects of educational attainment and economic strain on the well-being and health of Black older adults.

In such conditions, while education shows weaker effects⁴⁵, economic strain may be particularly impactful on populations that have low access to buffers such as social support, which is common in old age³³. As a result, research has documented major adverse health effects of economic strain for Blacks^{40,52,53} and older adults⁵⁴⁻⁵⁶. For example, in one study in a Black community, economic strain at baseline predicted future heart disease⁴². These adverse effects of economic strain in the elderly may be compounded by unemployment, social isolation, lack of access to transportation, and various chronic diseases.

In a recent study⁵⁷, economic strain was positively associated with chronic diseases, chronic pain, self-rated health, depressive symptoms, and sick days. Although this study suggested that economic strain seems to be linked to self-rated health, sick days, chronic pain, chronic diseases, and depressive symptoms, this study did not compare the role of economic strain and educational attainment. The authors of that study advocated for the evaluation of social determinants of health in providing health care of Black older adults. However, the study did not control for several confounders. In fact, the results were based on zero-order or partial correlations and multivariable analysis that can investigate the joint effects of educational attainment and economic strain on mental and physical health outcomes while other confounders are controlled.

Aims

The current study investigated additive effects of educational attainment and economic strain on five health outcomes, namely depressive symptoms, pain intensity, chronic diseases, self-rated health, and sick days, for Black older adults in the underserved areas of South Los Angeles. The hypothesis was that educational attainment would have a small protective effect, while economic strain will show a considerable risk effect in our sample. We expected the very same pattern across health outcomes⁵⁸ for the combined effects of education and economic strain⁵⁹⁻⁶¹. That is, we expect that in contexts with high economic constraints, economic strain will operate as a risk while education will fail to show considerable protective effects. This hypothesis is in line with the observation that racism limits the health gains that follow educational attainment^{20,22,23,45,47-49,62-65}.

Methods

Design

This cross-sectional household survey was conducted in South Los Angeles 2015-2018. The study was initially

conducted to investigate medication-related challenges of Black older adults⁶⁶⁻⁶⁹. The interview collected data on demographic factors, SES characteristics (education and economic strain), health insurance, living arrangement, marital status, depressive symptoms, pain intensity, chronic diseases, self-rated health, and sick days. While the full evaluation took up to 4 hours, the structured face-to-face interview lasted about 2 hours. Interviews were performed by a physician or a nurse.

Participants and Sampling

The study recruited a convenience sample of Black older adults. Participants were recruited from predominantly Black housing units and senior centers that were located in South Los Angeles. Participants were Black or African American, non-institutionalized people, all age 65 years or older. All participants had hypertension.

The original study, which was conducted to examine medication-related challenges in Blacks with hypertension, included a total number of 740 Blacks aged 55 years and older. However, in the current study, we exclusively focused on participants that were 65+ years of age ($n = 619$). No institutionalized participant was enrolled from skilled nursing facilities. Considerable cognitive deficits or current enrollment in a clinical trial were exclusion criteria.

Institutional Review Board

The protocol of the current investigation was approved by the institutional review board at the Charles R. Drew University of Medicine and Science. All participants signed consent before enrollment in this study.

Study Measures

Study variables in this analysis included demographic factors (i.e., gender and age), objective SES (i.e., educational attainment), living arrangement, marital status, health insurance, economic strain, depressive symptoms, pain intensity, chronic diseases, self-rated health, and sick days.

Demographic Factors: Gender and age were entered as demographic covariates. Age was an interval variable, operationalized as a continuous measure. Gender was a dichotomous variable.

Living Arrangement. Participants were asked if they were living alone or whether there were any other family members or a partner living with them. Living arrangement is a strong determinant of health among older adults⁷⁰.

Marital Status: Participants' marital status was coded as non-married = 0 and married = 1.

Health Insurance Status: Participants were asked about their health insurance coverage. Health insurance status was a dichotomous variable that reflected health

insurance (0/1). We considered being covered by Medicare, Medicaid, VA, non-federal health insurance, or private insurance as having health insurance. As only six individuals did not have health insurance, we did not include health insurance in our multivariable linear regression model.

Health Behaviors: Participants reported if they were smoking cigarettes and whether they were drinking alcohol. These two variables were conceptualized as dichotomous variables.

Objective Socioeconomic Status (SES): Education attainment was the only measure of objective SES. Education was an interval variable (years of schooling) with a higher score indicating more educational attainment.

Economic Strain: Self-reported (perceived) economic strain was measured using three items that were in line with Pearlin's list of main chronic economic strains that are being experienced by low SES individuals⁷¹⁻⁷³. These items assess whether self-reported money is sufficient to meet essential needs (food, clothes, mortgage, bills). The items also measured the frequency of not having enough money to buy enough food, clothing, and paying bills. Responses were on a 0 to 5 scale, with responses ranging from 'never' to 'always' (with 0 signifying "never" and five signifying "always"). A total score was calculated with a high score reflecting more economic strain. Reliability of the measure was excellent with a Cronbach alpha = .923.

Symptoms of Depression: This study used the 15 item-Short Geriatric Depression Scale to evaluate symptoms of depression⁷⁴⁻⁸⁷. Responses were on a "yes" or "no" scale. The depressive symptoms sum score ranged between 0 and 15 with higher scores suggestive of the presence of more severe symptoms of depression. The Geriatric Depression Scale -Short form has acceptable validity and reliability. This measure has been frequently used in community and clinical settings⁷⁴⁻⁸⁷.

Pain Severity: We measured the intensity of pain using four subscales of the McGill Pain Questionnaire- Short-Form 2⁸⁸. During a face-to-face interview, respondents responded to 22 questions on the extent of experiencing various types of pain over the past seven days. Items were on an 11-point numeric rating scale from 0 to 10 (none to worst possible). Our total pain score was calculated based on mean score of all items⁸⁸⁻⁹⁴. A higher score is indicative of more pain intensity.

Chronic Diseases: Participants were asked about 11 chronic diseases. Participants reported if a physician or a healthcare provider has ever told them that they have any of the following chronic diseases: asthma, chronic obstructive pulmonary disease, diabetes, hypertension, heart disease, lipid disorder, thyroid disorder, cancer, osteoarthritis, rheumatoid arthritis, and gastrointestinal disease. While self-reported chronic diseases is valid⁹⁵⁻⁹⁷,

some bias should be expected due to underreporting of some conditions.

Self-Rated Health: Participants' self-rated health was assessed by a single-item health measure with five options^{64,98-105}. The item reads, "In general, would you say your health is: "very good," "good," "fair," "bad," and "very bad." Responses were on an interval variable ranging from one to five, with a high score indicating poor self-rated health. Poor self-rated health predicts the risk of mortality^{64,98-105}.

Sick Days: A single item which read "In the past 12 months, how frequently have you been sick?" was used to assess sick days in the past year. The responses ranged from never (coded as 1) to always (coded as 5). A higher score indicated a higher number of sick days. This measure is commonly applied in previous studies¹⁰⁶⁻¹⁰⁸.

Statistical Analysis

We used SPSS 23.0 for data analysis. To describe the sample, we reported frequency (n), relative frequency (%), mean, and standard deviation (SD). We used the Pearson correlation test for our bivariate analysis. We applied linear regression models with health outcomes as the dependent variable, educational attainment, and economic strain as the independent variables, and age, gender, marital status, and living arrangements were the covariates. Give that only six participants did not report having some types of health insurance; we did not include this variable in our multiple linear regression models. We reported unstandardized b, standard error (SE), 95% confidence intervals (95% CI), and level of p values.

Results

Table 1 shows a summary of all study variables in the pooled sample. Most participants were female (65.3%) and were living alone (59.9%). Only a small percentage were

married (14.2%). Almost all participants reported having health insurance (99%). On average, participants were 74.0 years old.

Table 2 shows the results of zero-order correlations using Pearson correlation test. Higher educational attainment

Table 1: Descriptive Statistics

	All n	%
Gender		
Female	404	65.3
Male	215	34.7
Married		
No	531	85.8
Yes	88	14.2
Living Alone		
No	248	4.1
Yes	371	59.9
Health Insurance (Any)		
No	6	1.0
Yes	613	99.0
Smoking		
No	523	84.5
Yes	96	15.5
Drinking		
No	433	7.0
Yes	186	3.0
	Mean	SD
Age (Years)	74.0	7.0
Educational Attainment (Years)	12.7	2.4
Economic strain	8.2	4.9
Depressive Symptoms	2.1	2.4
Pain Intensity	1.8	2.1
Chronic diseases	3.8	1.9
Self-Rated Health	3.1	1.0
Sick Days	2.4	1.0

SD: Standard Deviation

Table 2: Bivariate correlations (Pearson correlation)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Age (Years)	1.00	-.20**	-.10*	-.04	.10*	-.01	-.23**	-.08*	.02	-.16**	-.11**	-.10*	-.12**
2 Educational Attainment (Years)		1.00	-.13**	.06	-.03	.08	-.28**	-.16**	-.09*	-.03	.00	-.07	-.03
3 Financial Difficulty			1.00	-.09*	.15**	.01	-.02	.05	.22**	.18**	.13**	.31**	.29**
4 Married				1.00	-.41**	-.01	.15**	.15**	-.02	-.09*	.00	-.05	-.07
5 Living Alone					1.00	-.01	.04	-.07	.07	.06	.04	.14**	.14**
6 Health Insurance						1.00	-.03	.07	.05	-.01	-.01	.03	.01
7 Smoking							1.00	.27**	.02	.17**	-.07	.18**	.08*
8 Drinking								1.00	-.02	.07	.03	.07	.12**
9 Chronic diseases									1.00	.27**	.27**	.32**	.44**
10 Self-Rated Health										1.00	.23**	.30**	.37**
11 Sick Days											1.00	.27**	.33**
12 Depressive Symptoms												1.00	.41**
13 Pain Intensity													1.00

* p < .05

** p < .01

was correlated with lower levels of economic strain ($r = -.13, p < .05$). Economic strain was positively correlated with worse status of all health outcomes (r ranging between .13 and .31, $p < .05$). Educational attainment was negatively correlated with the number of chronic diseases ($r = -.09, p < .05$) but not with any of the other four health outcomes ($p > .05$). All health problems were positively correlated with each other (r ranging between .33 and .44, $p < .05$).

Table 3 shows the results of five linear regression models, one for each health outcome. In all these models, educational attainment and economic strain were the independent variables, a health outcome was the dependent variable, and age, gender, marital status, living arrangement, and health behaviors (smoking and drinking) were the covariates. These models suggest that economic strain, but not educational attainment, was associated with depressive symptoms, pain intensity, number of chronic diseases, self-rated health, and sick days. Similar patterns emerged regardless of health outcome.

Discussion

The current study explored how educational attainment and economic strain are associated with five health outcomes, namely depressive symptoms, pain intensity, number of chronic diseases, self-rated health, and frequency of sick days in Black older adults residing in economically disadvantaged areas of South Los Angeles. The results suggested that while educational attainment failed to protect them, high economic strain was associated with various poor health outcomes among Black older adults. Based on these results, we advocate for increased policies and programs that can stabilize incomes for Black populations across the life span.

As limitations should be in mind before the results are interpreted, we start our discussion with a review of the limitations of the current study. First, our cross-sectional design does not allow any causal inferences. Our results suggest association rather than causation. Second, there were some omitted SES indicators such as income and wealth. Given the sensitivity of economic and financial information and large amounts of missing data regarding income and wealth due to lack of disclosure¹⁰⁹, and even low reliability of these variables in simple interviews¹¹⁰, we did not collect data on such sensitive information¹¹¹. Future research should go beyond measuring education and economic strain and also measure income and wealth. Third, the sample was convenient. Thus, the results are not generalizable to all Black older adults in the US. Despite these limitations, the current study extends the limited existing knowledge on social determinants of physical and mental health of Black older adults in low-income urban settings.

In line with our hypotheses, educational attainment

did not affect chronic diseases, self-rated health, sick days, depression, or pain. Similar smaller effects of SES were found on self-rated health^{20,46}, depression^{60,63}, and chronic

Table 3: Summary of five linear regression models with depressive symptoms, pain intensity, chronic diseases, self-rated health, and sick days as outcomes

	B	SE	95% CI		t	P
Depressive Symptoms						
Gender (Female)	.08	.20	-.32	.48	.41	.681
Age (Years)	-.02	.01	-.05	.01	-1.55	.121
Educational Attainment (Years)	-.04	.04	-.13	.04	-1.09	.278
Financial difficulty	.13	.02	.09	.17	6.66	<.001
Marital (Married)	.09	.29	-.48	.67	.31	.757
Living Arrangement (living alone)	.57	.21	.16	.98	2.71	.007
Smoking	.89	.28	.34	1.45	3.17	.002
Alcohol Use	-.08	.21	-.50	.34	-.37	.713
Pain Intensity						
Gender (Female)	.42	.18	.07	.76	2.37	.018
Age (Years)	-.03	.01	-.06	-.01	-2.55	.011
Educational Attainment (Years)	-.03	.04	-.10	.04	-.81	.418
Financial difficulty	.10	.02	.07	.14	6.15	<.001
Marital (Married)	.02	.25	-.48	.52	.06	.949
Living Arrangement (living alone)	.42	.18	.06	.78	2.31	.021
Smoking	.13	.24	-.35	.61	.51	.607
Alcohol Use	.32	.18	-.05	.68	1.72	.086
Chronic diseases						
Gender (Female)	.47	.16	.16	.79	2.93	.004
Age (Years)	.00	.01	-.02	.03	.30	.765
Educational Attainment (Years)	-.07	.03	-.13	.00	-1.95	.052
Financial difficulty	.08	.02	.05	.11	5.27	<.001
Marital (Married)	.17	.23	-.29	.63	.75	.456
Living Arrangement (living alone)	.17	.17	-.16	.50	1.02	.306
Smoking	.15	.22	-.29	.59	.66	.508
Alcohol Use	-.18	.17	-.51	.15	-1.07	.286
Self-Rated Health						
Gender (Female)	.20	.08	.03	.36	2.31	.021
Age (Years)	-.02	.01	-.03	-.01	-3.07	.002
Educational Attainment (Years)	-.02	.02	-.05	.01	-1.12	.265
Financial difficulty	.03	.01	.01	.04	3.21	.001
Marital (Married)	-.17	.12	-.41	.07	-1.39	.165
Living Arrangement (living alone)	.06	.09	-.11	.23	.68	.495
Smoking	.38	.12	.15	.61	3.21	.001
Alcohol Use	-.01	.09	-.18	.17	-.07	.946
Sick days						
Gender (Female)	.07	.09	-.11	.24	.74	.461
Age (Years)	-.01	.01	-.03	.00	-2.37	.018
Educational Attainment (Years)	.00	.02	-.04	.03	-.15	.884
Financial difficulty	.02	.01	.01	.04	2.85	.005
Marital (Married)	.05	.13	-.20	.31	.40	.689
Living Arrangement (living alone)	.09	.09	-.09	.28	1.00	.317
Smoking	.14	.12	-.10	.39	1.14	.256
Alcohol Use	-.17	.09	-.35	.02	-1.77	.078

b: Unstandardized regression coefficient; SE: Standard Error; CI: Confidence Interval

diseases^{46,47}. We, however, are not aware of any previous studies showing the same pattern for pain. Besides, most of the previous findings are in children^{45,46,48,49} and adults^{20,46,62}, and very few previous studies have shown the same patterns for older adults⁵⁰. Thus, two innovations of these results are to expand the literature, which is mostly on youth and adults, to older adults, and also document the same patterns for pain intensity. Finally, while most previous findings are on national samples^{20,47,62}, the current study suggests that similar patterns hold at a local level^{46,65}.

In the absence of a protective effect of education, the health and well-being of Black individuals seem to be strongly impacted by economic strain. Previous research has shown the role of economic strain as a significant threat to the health of the Black communities^{40,52,53}, particularly for Black older adults⁵⁴⁻⁵⁶. While economic strain limits people's options for health-supporting behaviors and access to resources and services³², it also operates as a source of psychological stress⁴¹. Economic strain increases the risk of mortality^{19,112-115}. This increased risk may be due to an increased risk of a wide range of chronic diseases⁴² including but not limited to heart disease¹¹⁴, diabetes³⁴, cancer¹¹³, hypertension⁴², poor self-rated health³⁵, or mental health problems such as anxiety^{43,116}, depression^{40,51} and suicide³⁹. Economic strain also increases behavioral risk, such as poor diet³⁶, smoking³⁷, and alcohol use³⁸.

Economic strain is shown to be one of the most influential social determinants of health^{35,117-125}. This effect is shown for the general population¹²⁶, people with chronic diseases³⁴, and older adults³². Economic strain becomes a stronger threat for Black older adults who lack social support and other potential buffers³³. Loneliness and lack of access to buffers seem to be a common element of aging in Black communities³³.

In the US, Black older individuals with a more economic strain experience worse health outcomes across all domains. This finding is not new as economic strain is a reliable SES indicator impacting various aspects of health in multiple studies^{40,112,127,128}. Also referred to as financial difficulty, stress, distress, or hardship^{41,43,54,129}, economic strain reflects a lack of resources, particularly the absence of liquid expendable income. Individuals under economic strain are unable to access and use services that they need, maintain pro-health behaviors, or access resources that buffer stress and illness when they occur^{32,55}.

Economic strain showing a harmful effect while education not showing a protective effect might be due to the economically constrained nature of low-income urban areas that are limited in resources. We found that economic strain shows consistent effects as identical patterns emerge across health outcomes. At the same time, highly educated and low educated Black older adults show

the very same risk of depressive symptoms, pain intensity, chronic diseases, poor self-rated health, and sick days, which is in line with the MDRs of education in resource-limited settings^{130,131}.

Educational attainment's failure to protect Black older adults against health problems may be due to high segregation and concentration of poverty in urban Black communities. Lack of protective effects of educational attainment in marginalized people, also called MDRs, has been attributed to structural racism and social stratification^{20,22,23,47,62,63}. This finding may also be attributed to five specific reasons: (a) poor quality of education in these communities, as discussed by Jenifer Manley¹³²⁻¹³⁷, (b) most Black older adults being out of the labor market (labor market carries some of the health gains of education attainment), (c) most Black older adults have some insurance, which covers their health needs regardless of their education, (d) absence of prestigious high paying jobs in urban settings, and (e) high education may increase psychological vulnerability of Blacks to racism, which reduces its protective effects. Some research has shown that high education may predict undesired mental health outcomes for Black individuals^{26-30,63,138,139}. Opposite to the pattern seen for Blacks, educational attainment always translates to better health for Whites¹⁻⁴.

Economic strain is closely linked to perceived stress^{33,112,140}. Thus, as shown by past research²⁵, economic strain may have stronger effects on Black older adults than hard SES indicators such as income or education²⁵. This might also be because perceived economic strain, depression, and perceived health have affective valence and component (i.e., tone/shade)^{51,141-143}.

Although education is known as a strong determinant of health¹⁻⁴, and as low education is believed to be a fundamental cause of racial health disparities¹⁸, education has differential implications across various social groups. While the most socially privileged groups gain the most amount of health from their education, this gain tends to zero for the least privileged groups^{64,144}. That is, while education is commonly shown to improve health, cross-racial variations exist in the health effects of education^{1-4,6-14}. Overall, while educational attainment improves health through multiple mechanisms, including promoting lifestyle¹⁶ for many populations including the elderly¹⁷, there is considerable evidence suggesting that educational attainment may lose some of its health effects for Black communities^{20-24,46}.

In line with the MDRs theory, the inner strength of this manuscript is questioning the presumption that educational attainment should result in a protective (or positive) effect on a person's health, long-term. We argue that embedded in this presumption is the "bootstrap" philosophy that hard

work (and investment on human capital) will pay off for all citizens, regardless of race or ethnicity, and translate into health as well as economic and financial security through educational pursuits that translate into job opportunities. Nevertheless, as shown by this study and the rest of the MDRs literature, these effects are not equitably distributed across all race/ethnic groups in our society. Socioeconomic factors do not similarly promote the health and wellbeing of Blacks and Whites^{11,12}. The magnitude of the effects of each additional year of schooling on health outcomes is smaller for Blacks than Whites^{11,12}. The threshold (i.e., stepwise) effect of educational credentials is also weaker for Blacks than Whites because the US labor market gives lower status jobs to Blacks than Whites^{20,21}. In the US, it is race *and* SES, not race *or* SES, that shape health¹⁴⁵⁻¹⁴⁷.

Aurora Jackson has conducted extensive work on economic strain, low paying jobs, unemployment, and how such conditions influence the daily lives of Blacks, particularly Black women^{148,149}. So has work by Hamilton and Darity on the wealth gap and economic conditions of Black families. They have proposed reparation and baby bonds as potential solutions to the wealth inequality of Blacks¹⁵⁰⁻¹⁵². Lincoln has also conducted studies on the interplay between various sources of stress, such as economic strain in Blacks¹⁵³⁻¹⁵⁵. The work of Oliver and Shapiro also has helped us understand the wealth gap between Blacks and Whites^{156,157}.

The work by Sherraden and Trina Shanks has helped us understand the life conditions associated with economic strain of low-income people, including Blacks¹⁵⁸⁻¹⁶⁰. Sherraden has tested innovations to improve the social and economic well-being of low-income families, including Blacks. He has proposed policies that may promote inclusion in asset building for marginalized people. One example of such asset-based policies and programs in the US is progressive child development accounts. In particular, they discuss the findings from the SEED for Oklahoma Kids study, which is a large-scale randomized statewide policy experiment that deposited \$1,000 into state-owned Oklahoma 529 College Savings Plan (OK 529) accounts for 1,358 children. Although Sherraden's work is on children and not older adults, his work is still relevant to our finding as it addresses the critical aspect of the discussion and implication section, which is providing financial incentives. These lines of work collectively suggest safety nets and economic policies that may help Black families and communities accumulate wealth and buffer the effect of deep poverty¹⁵⁹⁻¹⁶³. Other studies have also shown positive health effects of reducing economic strain¹⁶⁴.

As this study showed, economic strain and education have very different effects on the health of disadvantaged racial and ethnic groups such as urban Black older adults who struggle with poverty while affected by multiple

chronic diseases. Similar patterns are shown by research for other sections of the Black communities^{20-24,46} as well as Hispanics^{62,65}, Native Americans¹⁶⁵, and other marginalized groups¹⁶⁶. The widespread and systemic nature of MDRs suggest MDRs are not innate or biological, but rather a function of racism, prejudice, and resource-scarce areas. Although MDRs of education are not specific to Blacks, but rather to any marginalized group, given the harsh living conditions of Blacks in poor urban areas, Minorities' Diminished Returns⁴⁵ may be more pronounced in Blacks^{20,24,25,46-49}.

Lack of wealth and economic reserve contribute to the vulnerability of Black older adults to economic strain and lack of cash^{14,117,167-176}. Being Black is associated with a hidden tax to the middle class. Due to some historical reasons, Blacks have extremely low levels of wealth. Slavery, redlining, Jim Crow laws, discriminatory lending, mass incarceration, war on crime, and many other policies have kept average Blacks poor¹⁷⁷⁻¹⁸³. Given such historical injustice, most Black families have not been able to accumulate wealth over time. Such wealth operates as a buffer in times of uncertainty when stress and hassles occur^{172,174}.

Excessive financial necessities continue to hurt the health of Black older adults in urban settings. Our findings suggest that policies that provide cash supply at the time of need may be promising as a strategy to tackle health disparities in urban areas where deep and chronic poverty compounds the health effects of multiple chronic diseases. Policy solutions to health disparities should go beyond health policies by including public and economic policies that address economic strain of Black older adults. A promising policy may be lending at the time of emergency.

Interestingly enough, the results reported here are quite consistent with a recent study conducted on older adults residing in a Central and Eastern European country. The authors also found that higher education was not enough to protect individuals against depressive symptoms, when adult socioeconomic position was taken into account. These findings may suggest that the lack of protective effects of education may be a pattern that hold for some populations within and outside the US¹⁸⁴.

Implications

Economic strain is a social factor modifiable through economic policies (e.g., tax, social welfare, and income redistribution) as well as on-ground programs that can be delivered to the communities (e.g., free tax preparation programs, financial empowerment services, and emergency funds). Reducing economic strain remains a hopeful public policy solution that can reduce or eliminate health inequalities of Blacks in urban areas¹⁵⁰⁻¹⁵².

What education can do in economically constrained

urban areas is very limited¹⁸⁵⁻¹⁹¹. In such a context, a lack of liquid assets (i.e., cash) becomes very detrimental. Economists Hamilton and Darity have proposed baby bonds as a potential solution to prevent economic strain among the next generation of Blacks. Baby bonds are trust accounts of up to \$60,000 for every newborn, which are calibrated to the family's wealth. This bond can help generate the required seed money for buying a home, starting a business, or help at the time of highest financial need. Another proposed solution by the same scholars is reparations as a potential solution to the wealth inequality of Blacks. These economic policies are specific proposals that, if written as the law can impact society and have significant national health effects as they effectively increase economic security for the Black community¹⁶⁴. These bold and innovative economic proposals (e.g., reparation, baby bonds, etc.) may be an effective way to reduce economic as well as health inequalities in the US. Writing these economic interventions as law and policies may be a stable solution to tackling health disparities in low-income Black communities.

Although multiple policy solutions can be brought to the table, here we discuss a relevant economic policy that can potentially buffer the effect of economic strain on low-income Black communities. Income redistribution policies that increase the access of two-income people to cash that can be used to pay bills and buy food are critical^{115,192,193}. The challenge is that such policies are not viewed positively in the US, given the over-emphasis of American culture on meritocracy (i.e., relying on bootstraps).

To more effectively bring social justice and equity to the public discourse and law, Blacks should gain more political power, so they get a louder voice and their agenda can be written as law^{115,192,193}. Although Blacks need to gain a stronger voice in the US political system, they are affected by poverty and related illnesses. That means the very same people who are supposed to solve the problem are disappearing faster and younger, because of poor health-related to poverty. In other words, the ones who need the change most do not get the chance to influence policy as they die earlier. Research shows that early mortality of Blacks results in a missed opportunity to correct the policies that can fix the problem of poverty among Blacks^{115,192,193}.

Beyond the policies mentioned, such as reparations, baby bonds, and savings accounts for children, there is also a need for local services that are delivered at the community level to provide support for economic and financial security, especially for older Blacks. Although these policies are possible solutions, they are mainly early childhood methods that may ameliorate economic strain later in life. At the same time, there is a need for a range of solutions where we do not need to wait 70 years to see results of early childhood policy interventions. Another

challenge is the likelihood of reparations in the current political climate. Although the need exists and the rationale clear, but these policy solutions may not be viable solutions for older adults, today.

To solve the current problems, safety net public healthcare systems should continue increasingly establishing co-located services (through Social Determinants of Health), and shared interagency centers should address nonmedical social needs, including financial and economic insecurity of individuals with multiple medical and social needs. Examples include free tax preparation programs that increase access to Earned Income Tax Credit and refunds and financial empowerment services that include onsite financial planning, budgeting, credit stabilization, under-banking, etc. In addition to emergency funds which have long existed through local government social service agencies, programs to address poverty concretely, and specifically for older adults, do exist in communities and should be mentioned as a viable way to serve older adults, particularly in underserved neighborhoods. Successful organizations that are on the ground and deliver services include Prosperity Now! and the NYC Department of Consumer Affairs, which is expanding its Financial Empowerment Centers across the city.

Future Research

It is still unknown whether elimination of economic strain through social and economic policies can be used as a sustainable policy to eliminate, or at least reduce, the existing racial gaps across health outcomes^{115,192,193}. There are only a few previous attempts and social experiments to reduce the disparities in the health of Black communities by reducing economic strain. There is also a need to study why educational attainment has a "less than expected" health effects for Black older adults in general and particularly in low-income urban contexts.

There is a need for future research to differentiate the aspects that make all vs. Black older adults experience economic strain. Such research would require various ethnic groups, including Whites. Such research in diverse samples may be able to show how the effects of economic strain are compounded for all particularly, Black older adults. While most older adults are not working, and many are socially isolated and live alone, and a large proportion has health conditions. These effects may or may not differ between White and Black older adults, which needs more research. There is also a need to decompose the adverse health effects of economic strain from those of social isolation, aging, and comorbid health conditions. This research would suggest that if people are stabilized financially, their social isolation will still be a remaining risk operating in the background.

There are some other variables that have not been taken into account in the current analysis. Among the most important missing variables are markers of early life socioeconomic position. Studies, however, have shown considerable amount of complexities, nuances, and heterogeneities in this regard. In one study, higher education of the mother was associated with better mental health (e.g. lower depressive symptoms) in older adults, independent of socioeconomic status in adulthood¹⁹⁴. On the contrary, higher education of the father was associated with lower depressive symptoms in adulthood, but this association is explained by socioeconomic status in adulthood¹⁹⁴. In addition, no comparison group was used in this study, thus it is unknown whether the same results would be relevant to any non-Black group or not.

Conclusion

Economic strain may be more a more salient social determinant of the health of Black older adults than educational attainment, at least in economically constrained settings. This finding is in line with the literature on MDRs, which has repeatedly shown weaker than expected effects of educational attainment for Black people. Such diminishing returns may be due to structural factors such as social stratification, segregation, and systemic racism across levels and institutions which are embedded in U.S. society.

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Disclosures

The authors declare that they have no competing interests.

Authors Contribution

Shervin Assari: Conceptualization, data analysis, first draft of the manuscript, revision, approval of the final draft. Mohsen Bazargan: Conceptualization, design, funding acquisition, overseeing the study, revision, and approval of the final draft. Sharon Cobb: Conceptualization, revision of the paper, approval of the final draft.

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