Black Americans’ Diminished Health Returns of Employment During COVID-19 Pandemic

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Abstract
Introduction: Employment is a major social determinant of health (SDoH) and core socioeconomic status (SES) indicator. This study used a nationally representative sample of American adults to test the association between employment and self-rated health (SRH) overall and by race.

Methods: Using data from the Health Information National Trends Survey (HINTS 2020) Cycle 4, this analysis included 1403 individuals including 1109 (79%) non-Latinx White and 294 (21%) non-Latinx Black participants. The dependent variable was SRH, the independent variable was employment, and age, sex, marital status, education, and income were the covariates. Race was the moderator.

Results: Employment was associated with better SRH overall. A significant statistical interaction reflected racial differences in the effect of employment (above and beyond education and income) on SRH by race. The protective health effects of employment on SRH were weaker for non-Latinx Black than non-Latinx White individuals.

Conclusion: The association between employment and SRH varies across racial groups, and this difference can also be seen during the COVID-19 pandemic. Diminished health returns of SES indicators such as employment in non-Latinx Black individuals compared to non-Latinx White people may reflect some additional health risk for middle-class non-Latinx Black communities in the US. Sustainability of marginalization-related diminished returns (MDRs), defined as weaker effects of social determinants and resources such as employment on health outcomes for marginalized than privileged social groups, is another risk for underserved populations during pandemics. These MDRs that reflect systemic inequalities may hinder our efforts to secure equality during pandemics.

Keywords: Social Determinants, Self-Rated Health, Population Groups, Employment

Introduction
Social determinants of health (SDoH) and socioeconomic status (SES) indicators such as employment have systemic health effects for individuals and populations. Mirowsky and Ross, Marmot, Link and Phelan, House and Lantz, and others have conducted multiple studies showing that regardless of their type, SDoH and SES indicators correlate with health outcomes. Other individuals such as Heckman, McLoyd, Cabrera et al., McNamara, Brenner et al., Brody and Flor, and others have shown that these effects hold for families and children as well. Some of the health effects of SES indicators are due to their coincidence with life stressors, adherence to health behaviors, neighborhood quality, and healthy development. For example, SES and SDoH indicators such as education, income, and employment protect individuals against tobacco use. This becomes more important as the effects of these social constructs on special patterning of tobacco use have become more and more salient over time. As such, tobacco use has become an issue requiring tailored intervention rather than a universally homogenous health problem.

However, the link between SES and SDoH indicators has complexities and nuances. First, different SES indicators may have different effects. We may observe differential effect of SES indicators for each outcomes. For example, improving education may better reduce cognitive risk compared to other SES indicators. Second, various SES indicators may operate through different mechanisms that may or may not have overlap. For example employment alters social context and residential area, social network, friends, access to power, stress, and income. Education, however, encourages healthy choices and behaviors, while income provides power, reduces stress, increases control over life, and does not have similar effects across social and demographic groups. SES

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and SDoH indicators show their strongest effects on socially privileged groups who can easily mobilize their SES and SDoH indicators to tangible outcomes.\textsuperscript{34,35} At the same time, SES and SDoH indicators have weaker effects for racialized and marginalized people.\textsuperscript{34,35} This observation is summarized as marginalization-related diminished returns (MDRs) and minorities’ diminished returns (MDRs).\textsuperscript{36} As a result of these MDRs, economic and health inequalities extend from lower to middle-class America.\textsuperscript{37,38} In line with these MDRs, some evidence suggests that some racial, economic, and health gaps may increase, rather than decrease, as SES increases.\textsuperscript{39} These are in part because of structural racism, which can manifest in many shapes and forms including but not limited to segregation,\textsuperscript{40} low education quality in urban areas, harsh school disciplinary actions,\textsuperscript{41} unfair banking policies,\textsuperscript{42} harsh policing,\textsuperscript{43} and discrimination in the labor market,\textsuperscript{44} all of which serves to block opportunities for minority populations across class lines. As such, establishing MDRs has become a tool to measure structural racism.\textsuperscript{45,46}

According to the MDRs literature, that has been exclusively conducted outside the COVID-19 pandemic, while high SES non-Latinx Whites show excellent health, high SES non-Latinx Blacks may remain at health risk.\textsuperscript{47} This pattern is well established for parental education,\textsuperscript{48} education,\textsuperscript{49} and income,\textsuperscript{50} however, there are only two studies on MDRs of employment on health.\textsuperscript{51,52} While MDRs are shown for Latinx,\textsuperscript{53} Asian,\textsuperscript{54} and Native American\textsuperscript{55} individuals, most of the literature is on Black vs. White individuals.\textsuperscript{46} Therefore there is a need to test if the health effect of employment is similar for non-Latinx White in comparison to non-Latinx Black people, during the COVID-19 pandemic, while education and income are controlled.\textsuperscript{46} In addition, although similar findings are shown for chronic disease,\textsuperscript{55} obesity, use of cigarettes,\textsuperscript{47} e-cigs,\textsuperscript{49} Hookah,\textsuperscript{50} and other substances,\textsuperscript{57,58} and SRH,\textsuperscript{59} all of these comparisons have been conducted in normal times without a macro event such as COVID-19 pandemic. They are also relevant to children, youth, adults, elders and various sources of marginalized groups based on race,\textsuperscript{60} ethnicity,\textsuperscript{61} sexual orientation,\textsuperscript{62} nativity,\textsuperscript{63,64} and even place,\textsuperscript{65} suggesting that any marginalization in the society reduces the gains that are expected to follow SES and SDoH on health. As a result of these increased health risks, we observe higher than expected risk of asthma,\textsuperscript{66} chronic obstructive pulmonary disease (COPD),\textsuperscript{67} and heart disease\textsuperscript{68} in high SES racialized adults.

There is a need for additional research on the MDRs of SES indicators, such as employment, with health outcomes such as SRH across diverse racial groups during the COVID-19 pandemic. Almost all past research is conducted in an era when pandemics do not limit living conditions. During the COVID-19 pandemic, SES indicators had an important role, and employment could impose or protect risk for individuals. As unemployment is higher for Blacks than Whites and Blacks typically have lower financial security, which could mean a higher reliance on the continuation of their job, it is important to test the employment-SRH link between White and Black adults during the COVID-19 pandemic.

We conducted this study to test the association between employment and SRH overall and by race. As employment is also confounded by education and income, we are interested to control for income and education. This will help us go beyond independent effects of employment and also test additive effects of employment, income, and education. We hypothesized an inverse association between employment and poor SRH, however, we expect this association to be stronger in non-Latinx Whites than non-Latinx Black individuals. In line with MDRs outside COVID-19 era, we expected employment, as a major economic resource, to have weaker health effects for Black people, as a historically marginalized group, during the COVID-19 pandemic.

**Methods**

This secondary data analysis applied a cross-sectional methodological design. Data came from the Health Information National Trends Survey (HINTS 2020) study Cycle 4 which was conducted between February 24, 2020, and June 15, 2020. Given the data’s de-identified nature, our secondary analysis was exempt from a full ethics review.

The HINTS study participants were adults residing across US states in 2020. The sampling frame for Cycle 4 consisted of a database of addresses used by Marketing Systems Group (MSG) to provide random samples of addresses. Any non-vacant US residential address was subject to sampling. This included but not limited to those present on the MSG database, including post office (P.O.) boxes, throwbacks (i.e., street addresses for which mail is redirected by the United States Postal Service to a specified P.O. box), and seasonal addresses. Although a total number of 3865 individuals completed surveys, which resulted in a 37% response rate, for this analysis, we only included 1403 individuals including 1109 (79%) non-Latinx White and 294 (21%) non-Latinx Black participants who had complete data on employment, education, income, age, sex, marital status, and self-rated health (SRH) and were either non-Latinx White or non-Latinx Black. We only included those who were recruited after pandemic was announced by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC).

The HINTS 2020 used a multi-stage stratified random sampling. For first sample stage, the sampling frame of addresses was grouped into the following two explicit sampling strata: 1). Addresses in areas with high concentrations of minority population; and 2). Addresses in areas with low concentrations of minority population. The second sampling stage was selection of a participant from each selected household. Only up to one participant was selected from each target household, upon eligibility.

SRH. The dependent variable was poor subjective SRH, measured by the following conventional SRH item: “In general, would you say your health is…” Item responses included excellent, very good, good, fair, or poor. We considered the answer “poor” as poor SRH (score = 1) and excellent, very good, good, and fair as good SRH (score = 0). So, our outcome reflected poor not good health.
Race. Participants were asked if they were White, Black, or from other racial background. The question read as “Are you Black or African American?” All participants who positively answered to the last question were excluded from this analysis.

Independent Variables

Employment

Educational attainment. The first independent variable was highest level of education at the individual level, measured by self-reported educational attainment question. We calculated this variable based on the highest level of education which was attained. The specific item was “What is the highest grade or level of schooling you completed?” This variable was a continuous variable with the following seven categories. (1) Less than 8 years, (2) 8 through 11 years, (3) 12 years or completed high school, (4) Post high school training other than college (vocational), (5) Some college, (6) College graduate, and (7) Postgraduate.

Household income. Based on a self-report measure, we calculated total household income, earned from all sources. The item read as “What is your combined annual income, meaning the total pre-tax income from all sources earned in the past year?” Responses included (1) $0 to $9999, (2) $10,000 to $14,999, (3) $15,000 to $19,999, (4) $20,000 to $34,999, (5) $35,000 to $49,999, (6) $50,000 to $74,999, (7) $75,000 to $99,999, (8) $100,000 to $199,999, and (9) $200,000 or more.

This variable was a continuous variable ranging from 1 to 9.

Marital status. The individual disclosed family marital status, a dichotomous variable which was coded as married or non-married (reference category). The specific item read as “What is your marital status?”

Gender. A dichotomous variable, gender was coded as male = 1 and female = 0 (reference category). Gender was self-reported.

Age. Participants reported their age. Age was a continuous variable measured in years. The question read as “What is your age?”.

Using SPSS 21, we performed univariate, bivariate, and multivariable analysis. For univariate analysis, we reported the mean (SD) and frequency tables (%) for our variables overall and by racial group. We calculated Chi-square and t test to compare our study variables by racial group, for our bivariate analysis. For our multivariable analysis, logistic/linear regression models were estimated for each independent variable (education or income). The first models did not include any interaction terms. These models only included main effects of race, employment, education, income, and covariates. After running our Models 1, Models 2 were performed that also had race by employment interaction term. This model included all previous terms (main effects) in addition to one race by employment interaction term. To test our modeling assumptions, we ruled out collinearity between study variables particularly education, income, employment, and race. The independent variable was employment, covariates included education, income, gender, age, and marital status. The moderator was race, as a proxy of racialization because we had controlled various SES indicators. Odds ratio (OR), regression coefficient, standard errors (SEs), and P values were reported. A P value of less than 0.05 was significant.

Results

Overall, 1403 individuals entered our analysis. This number included 1109 (79%) non-Latinx White and 294 (21%) non-Latinx Black participants. Table 1 reports descriptive data overall and by race. Participants varied in age from 18 to 100

<table>
<thead>
<tr>
<th>Table 1. Descriptive Data Overall and by Race (n = 1403)</th>
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</thead>
<tbody>
<tr>
<td>All (N = 1403)</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Women</td>
</tr>
<tr>
<td>Men</td>
</tr>
<tr>
<td>Marital Status</td>
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<tr>
<td>Unmarried</td>
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<tr>
<td>Married</td>
</tr>
<tr>
<td>Employment Status</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Employed</td>
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<tr>
<td>SRH</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>Poor</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>SD</td>
</tr>
<tr>
<td>Household Income (1 - 9)</td>
</tr>
</tbody>
</table>

Abbreviation: SRH, self-rated health.

*P < 0.05 for comparison of Blacks and Whites.
Table 2 provides a summary of logistic regression models without and with interaction terms between employment and race. According to this table, based on Model 1, employment was inversely associated with poor SRH, indicating that adults who were employed reported better SRH. According to Model 2, however, the employment–SRH association varied by race, with the inverse association being weaker for non-Latinx Black than non-Latinx White individuals.

Table 3 provides a summary of logistic regressions by race. The results of previous Model 2 were confirmed, meaning a weaker protection of employment against poor SRH for non-Latinx Black than non-Latinx White individuals. While the protection was significant for non-Latinx Whites, it was not significant for non-Latinx Blacks.

Discussion

The aim of this study was to test overall and racial differences in the association between employment and SRH among American adults during the COVID-19 pandemic. Our first hypothesis was that the protective effect of employment against poor health would be stronger for non-Latinx White than non-Latinx Black individuals. Our second hypothesis was that the protective effect of employment against poor health would be stronger for non-Latinx White than non-Latinx Black individuals. Both of our hypotheses were confirmed.

Table 2. Association Between Employment and Poor Self-rated Health Overall (N = 1403)

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Black</td>
<td>-0.370</td>
</tr>
<tr>
<td>Male</td>
<td>-0.039</td>
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<tr>
<td>Age</td>
<td>0.005</td>
</tr>
<tr>
<td>Married</td>
<td>0.413</td>
</tr>
<tr>
<td>Education</td>
<td>-0.340</td>
</tr>
<tr>
<td>Income</td>
<td>-0.271</td>
</tr>
<tr>
<td>Employment</td>
<td>-1.181</td>
</tr>
<tr>
<td>Employment x Race</td>
<td>2.317</td>
</tr>
</tbody>
</table>

Abbreviations: OR, odds ratio; SE, standard error.
Outcome: Poor SRH (Poor).

Table 3. Association Between Employment and Poor Self-rated Health by Race (N = 1403)

<table>
<thead>
<tr>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Male</td>
<td>0.216</td>
</tr>
<tr>
<td>Age</td>
<td>0.009</td>
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<tr>
<td>Married</td>
<td>0.366</td>
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<tr>
<td>Education</td>
<td>-0.378</td>
</tr>
<tr>
<td>Income</td>
<td>-0.230</td>
</tr>
<tr>
<td>Employment</td>
<td>-1.976</td>
</tr>
</tbody>
</table>

Abbreviations: OR, odds ratio; SE, standard error.
Outcome: Poor SRH (Poor).

Similar to employment and income, employment is a major SDoH and SES indicator. As shown by Mirowsky and Rossman, Link and Phelan, and House and Lantz, health effects of SES indicators hold across populations, outcomes, settings, and age groups. Their work has generated robust empirical evidence and rich theoretical argument on better health of individuals who are employed, educated, and have higher income. These SDoHs and SES indicators enhance a wide range of health, behavioral, and developmental outcomes through various mechanisms that include better environment, healthy options, healthy choices, low stress, and healthy development. However, some SES indicators operate through more behavioral and some SES indicators may operate through developmental and contextual mechanisms. For example, families with higher SES and SDoH resources show less substance use and depression. Over time, SES indicators and SDoHs are showing stronger health effects.

In line with MDRs, for non-Latinx Whites, poor health is concentrated for poor, unemployed, and less educated people. This is not the case for Blacks, for whom SES indicators are less salient, given diminished returns of SES. For Blacks, health problems sustain across class lines, because SES and class show weaker health effects.

We found that in COVID-19 pandemic, an SES and SDoH indicator such as employment may have weaker effects for racialized and marginalized people, particularly non-Latinx Black people. This observation is in line with MDRs, as shown by Mirowsky and Rossman, Link and Phelan, House and others. Health effects of SES indicators hold across populations, outcomes, settings, and age groups.
theory. As a result of these MDRs, economic and health inequalities extend from lower to middle-class America. In line with these MDRs, some evidence suggests that some racial, economic, and health gaps may increase rather than decrease as SES increases. Due to structural racism, Jim Crow, social stratification, historic discrimination, and residential and job segregation, as well as labor market discrimination, non-Latinx Black individuals work in worse jobs than non-Latinx White people, which may reduce the health return of employment for Black communities. This is why some scholars have indicated that MDRs reflect structural racism.

Racism can manifest in many shapes and forms including, but not limited to, segregation, low job and education quality in urban areas, unfair banking policies, harsh policing, and discrimination in the labor market. All of these processes may further block opportunities for minority populations across class lines (regardless of their employment and SES). This is why MDRs should be undone if we wish to undo racism. In one study, employed non-Latinx people were protected against tobacco use, but employed Latinx people had high risk of smoking. In another study, highly educated non-Latinx Black people had high occupational stress, while highly educated non-Latinx White people had low occupational stress. Finally, in a study, employment had a larger effect on life expectancy of Black than White people. These MDRs reflect unequal occupational opportunities of Whites and Blacks, regardless of SES indicators such as employment. In the US, people’s insurance status is closely tied to their employment. Thus insurance may be a factor in MDRs of employment for Black populations.

A recent piece of literature on MDRs has shown that, while high SES non-Latinx Whites show the least health problems, high SES Latinx and Black people report higher levels of poor health and risky behaviors. This association is reported for parental education, education, and income. Similarly, the same finding is shown for mental, physical health, and health behaviors such as traditional cigarette, e-cig, Hookah, and alcohol use, suggesting that these diminished returns are independent of health problems or risk behaviors. They are also shown for youth, adults, and older adults, as well as various sources of marginalization, namely race, sexual orientation, and immigration status, suggesting that any marginalization in the society reduces the health gains that are expected to follow SES and SDoH. To give a few examples, we observe higher than expected risk of asthma, COPD, and heart disease in high SES racialized and racial minority adults.

There is a need for additional research on the effect of time, cohort, pandemics, and other political and macro factors on the associations between SES indicators and health outcomes across diverse racial groups. Most past research is conducted regardless of macro events such as pandemics or economic slowdowns. These macro events may have differential impacts on subpopulations, and there is a need to compare White and Black individuals across time frames. Thus, there is a need to compare diverse groups for the health returns of SES indicators across time intervals that may change human and economic behaviors. The COVID-19 pandemic, for example, resulted in a major pressure across minority populations. While MDRs are also shown for Latinx, Asian, native American, immigrant, and Black individuals, almost all of this literature is on normal times. So there is a need to test the effects of COVID-19 pandemics in changing the recognized patterns for diverse populations. Mechanisms of disparities may change based on macro data, and contributors of health disparities may vary across time.

Limitations
There are some limitations to the current study. The sample size was different across racial subgroups, thus the statistical power was non-identical across racial groups. The outcome was single item self-reported, which may reflect measurement bias by race. Experience and report of SRH may be influenced by race, culture, SES, and sex/gender. We excluded Latinx, Asian, and other marginalized groups. We also did not have data on type of job, years of experience, and pay per hour/year, that could reflect labor market discrimination. All our variables were individual level, and we did not have access to distribution of jobs and occupational segregation in neighborhoods. Some strengths include large overall sample size, robust methodology, and random sample, and control of other SES indicators such as education and income.

Conclusion
To conclude, employment, as a SES indicator, shows diminished health returns for marginalized and racialized people (non-Latinx Black), which may reflect racism, social stratification, and historic discrimination in the US. This observation holds for the COVID-19 era, and addressing health inequalities during the pandemic requires addressing MDRs.

Authors’ Contributions
Study design: AA, data collection: BN, conceptual design: SA, data analysis: SA, prepare draft: AA, revision: AA, BN, SA. All authors approve the final draft.

Conflicts of Interest
Disclosures
The authors declare that they have no conflict of interest.
Ethical Approval
It was exempt from full IRB review because it was based on a fully deidentified publicly available data set.

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Blacks’ diminished returns of employment


