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Race, Socioeconomic Status, Health Locus of Control, and Body Mass Index

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Abstract

Background: This cross-sectional study aimed to investigate the complex interplay between socioeconomic status (SES), internal and external health locus of control, and body mass index (BMI) in a national sample of US adults. Given the unique challenges faced by Black individuals, it was hypothesized that the relationships between SES, internal and external health locus of control, and BMI would be weaker for Blacks compared to Whites.

Methods: For this cross-sectional study, baseline data from the MIDUS Refresher sample, consisting of US adults, were analyzed. SES indicators such as income and education were examined as predictors of internal and external health locus of control. The analyses were conducted overall without and with race interactions. We also ran models within different racial groups.

Results: Overall, 3198 participants entered our analysis who were White or Black. From this number, 2925 (91.5%) were White and 273(8.5%) were Black. In the pooled sample, high education and income were linked to higher internal and lower external health locus of control and lower BMI. The study revealed that the relationships between high SES indicators (income and education), internal health locus of control, and BMI were weaker for Black than White individuals. The study revealed that the relationships between high SES indicators (income and education) and external health locus of control was stronger for Black than White individuals.

Conclusion: This study provides evidence for the complex interrelationships between SES, health locus of control, and BMI, while highlighting the role of race as a moderating factor. The findings suggest that the effects of SES on internal health locus of control is influenced by race, with weaker relationships observed among Black individuals compared to Whites.

Introduction

In recent decades, the relationship between socioeconomic status (SES) and health has garnered significant attention within the field of public health. Numerous studies have demonstrated a strong association between higher SES and a wide range of improved health outcomes, including lower body mass index (BMI). While the mechanisms underlying this association are multifaceted (e.g., stress, neighborhood, nutrition, health behaviors, etc), health locus of control may play a role.

Internal and external health locus of control are two interrelated psychological constructs that refer to individuals' beliefs about the extent to which they can control events in their lives or whether their environment controls them[1]. These constructs have emerged

as potential mediators in the relationship between SES and health outcomes, such as BMI[2-4]. It has been suggested that individuals with a higher internal health locus of control, perceiving themselves as having greater control over their own behaviors and circumstances, are more likely to engage in health-promoting behaviors and adopt healthier lifestyles, leading to lower BMI[5-7]. Conversely, those with a higher external health locus of control, perceiving external and environmental forces as controlling their lives, may be more susceptible to negative health outcomes, including higher BMI[7-9].

While the relationships between SES and internal and external health locus of control have been explored[4,10-13], the role of race in this complex interplay has received comparatively less attention. Racial disparities in health outcomes, such as higher BMI, persistently challenge public health efforts aimed at achieving health equity[14]. These disparities are shown to persist even among high SES individuals, suggesting that the effects of SES indicators are weaker for Black individuals compared to White individuals[15-19], as suggested by the concept of Minorities' Diminished Returns (MDRs)[20]. According to MDRs, social stratification, segregation, structural racism, limited access to healthcare, and economic inequalities reduce the effects of SES indicators for Black individuals compared to their White counterparts[21].

Drawing upon the concept of MDRs[20], it can be argued that racial minority groups, including Black individuals, face unique constraints that may influence the impact of SES on health locus of control[22,23]. Historical and contemporary factors, such as systemic racism, discrimination, and residing in under-resourced areas, may shape the beliefs and experiences of Black communities differently from those of White populations[24-27]. Consequently, the relationships between SES, internal and external health locus of control, and their implications for health outcomes, such as BMI, may vary across racial groups[28,29]. We refer to this phenomenon as the racialization of health returns of SES and health locus of control. In this view, even in the presence of high SES, Whites, but not Blacks, are expected to exhibit a high internal health locus of control, and in the presence of a high health locus of control, Whites, but not Blacks, are expected to show low BMI.

Aims

In this paper, our aim is to examine the complex interplay between race, SES, health locus of control, and BMI as one of many health outcomes that exhibit disparities between Black and White populations. Our central argument is that while higher SES is generally associated with an increased internal health locus of control and a decreased external health locus of control, these relationships may differ for Blacks due to the unique constraints and challenges they face. Specifically, we hypothesize that Black individuals, who experience greater social and economic disadvantages, may not experience the same positive effects of education and income on their internal and external health locus of control as their White counterparts. Similarly, we hypothesize that Blacks will not show a similar decline in BMI in response to an increase in their internal health locus of control. By exploring the intricate dynamics between race, SES, and health locus of control, this research aims to contribute to the understanding of health disparities and provide insights for tailored interventions and policy recommendations. Addressing the nuances of these relationships will help unravel the complexities of socioeconomic and racial influences on health outcomes, working towards achieving health equity for all individuals.

Methods

Design and Setting

This was a cross-sectional study that used baseline data from the Midlife Refresher sample[30-34]. MIDUS Refresher that refers to the Study of Midlife in the United States[35,36] consented adults with age of 24 of older.

Sample

Slightly more than 50% of the sample was female, and most sample identified as White/European American followed by Black/African American, Other" race/ethnicity, Asian, and Native American. Detailed information regarding participant recruitment and data collection can be found elsewhere[37]. The MIDUS Refresher sample was recruited to maintain the original MIDUS power adequate, despite the drop of the sample and attrition over time[30-34].

Analytical Sample

Overall, 3198 participants were entered in our analysis who were either White or Black. From this number, 2925 (91.5%) were White and 273(8.5%) were Black. Eligibility was only based on White or Black race.

Measures

A number of demographic variables were included age, sex, education, income, US-born (nativity), and marital status. Age was self-reported in years. Biological sex was 0 for Female and 1 for Male. Race was 1 for Black/African-American and 0 for White. BMI was continuous and calculated as weight per square body surface.

Internal health locus of control was measured using the following items: 1) Keeping healthy depends on things I do, 2) Things I can do to reduce heart attack risk, 3) Things I can do to reduce cancer risk. Responses were between 1 and 7 that reflected strongly disagree to strongly agree. The score was continuous with higher score indicating higher internal health locus of control.

External health locus of control was measured using these items: 1) Getting better is in doctor's hands, 2) Difficult to get good medical care, and 3) I work hard at trying to stay healthy. Responses were between 1 and 7 that reflected strongly disagree to strongly agree. The score was continuous with higher score indicating higher external health locus of control.

Analysis

The Statistical Package for the Social Sciences (SPSS) 27.0 was used for data analysis. For univariate analysis, we used mean (SD) for continuous measures and n and relative frequency for categorical variables. For bivariate analysis, we used Pearson correlation test. We ran these correlations for overall sample and subgroup analyses based on race. These analyses were conducted to assess the associations between income and the outcomes of interest. For multivariable modeling, we ran general linear model, which is more conservative and has fewer assumptions regarding distribution of the errors. Given that our aim was to investigate interactions (which are rare), and given the small sample size of Black participants, we did not apply Benfroni correction. So, the results may have some false positive associations particularly in White and overall sample. We ran race-specific models because confounders may differently correlate with the outcomes across racial groups.

Results

Overall, 3198 participants were entered in our analysis who were either White of Black. From this number, 2925 (91.5) were White and 273(8.5) were Black. As shown in Table 1, average age of participants was 51 (SD = 14.4). Whites had significantly higher average age than Black participants. Whites had higher education and lower BMI than Blacks.

As shown by Table 2, in the pooled sample, and in Whites, education and income were positively correlated. Internal and external health locus of control were also inversely associated. Education and income were positively correlated with internal health locus of control. Education and income were inversely correlated with external health locus of control. Education and income were inversely correlated with BMI. Internal health locus of control was inversely associated with BMI. External health locus of control was positively correlated with internal health locus of control.

Many of these correlations were absent in Blacks. Education and income were not correlated with BMI, and internal but not external health locus of control was associated with BMI. We did not observe correlation between internal and external health locus of control in Blacks.

Table 2: Bivariate correlations between study variables overall and by race

	1	2	3	4	5	6	7	8
All								
1 Education	1.00	.42**	-.06**	-0.02	-.06**	.14**	-.26**	-.22**
2 Income		1.00	0.01	-.32**	-.09**	.07**	-.24**	-.06*
3 Age			1.00	0.00	-.08**	0.03	.07**	.10**
4 Male				1.00	.08**	.06**	.07**	-.04*
5 Race					1.00	.05*	.04*	.09**
6 Internal Health Locus of Control						1.00	-.08**	-.24**
7 External Health Locus of Control							1.00	.09**
8 BMI								1.00
Whites								
1 Education	1.00	.41**	-.06**	-0.03	-	.15**	-.25**	-.23**
2 Income		1.00	-0.01	-.33**	-	.08**	-.22**	-.06*
3 Age			1.00	0.02	-	0.03	.07**	.11**
4 Male				1.00	-	.07**	.07**	-.07**
5 Race					-	-	-	-
6 Internal Health Locus of Control						1.00	-.09**	-.25**
7 External Health Locus of Control							1.00	.09**
8 BMI								1.00
Blacks								
1 Education	1.00	.46**	-0.11	0.08	-	0.05	-.37**	0.00
2 Income		1.00	0.09	-.16*	-	0.03	-.39**	0.11
3 Age			1.00	-0.10	-	0.06	0.06	0.04
4 Male				1.00	-	-0.08	-0.03	0.14
5 Race					-	-	-	-
6 Internal Health Locus of Control						1.00	0.08	-.17*
7 External Health Locus of Control							1.00	0.05
8 BMI								1.00

*p<0.05 ** p<0.01 *** p<0.001

Table 1: Descriptive Data overall and by Race

	White (n = 2925)		Black (n = 273)		All (n = 3198)	
	Mean	SD	Mean	SD	Mean	SD
Age	51.36	14.36	47.32	14.04	51.01	14.38
Education (1-12)	7.85	2.48	7.27	2.61	7.80	2.49
Income (USD)	53118.34	50070.65	39314.32	37982.10	51989.65	49333.50
Internal Health Locus of Control	6.07	0.73	6.16	0.83	6.08	0.74
External Health Locus of Control	3.13	1.29	3.41	1.58	3.15	1.31
Body Mass Index (BMI)	28.73	6.83	31.56	8.55	28.93	7.00

Table 3: Summary of general linear model on the associations between education and income and internal health locus of control

	b	SE	Beta	CI		p
Model 1						
Race	.14	.06	.05	.01	.27	.030
Male	.09	.03	.06	.02	.15	.010
Age	.002	.00	.04	.00	.00	.112
Latino	.12	.10	.03	-.08	.32	.253
US Born	.07	.09	.020	-.10	.24	.389
Education (1-12)	.04	.01	.13	.03	.05	.000
Income	.001	.00	.05	.00	.00	.057
Model 2						
Race	.57	.22	.20	.14	1.00	.009
Male	.09	.03	.06	.02	.15	.009
Age	.002	.001	.04	.00	.00	.116
Latino	.12	.10	.03	-.08	.32	.242
US Born	.08	.09	.020	-.09	.24	.387
Education (1-12)	.04	.01	.14	.03	.06	.000
Income	.001	.00	.04	.00	.00	.086
Race x Education (1-12)	-.06	.03	-.18	-.12	-.00	.037
Race x Income	.002	.00	.03	.00	.00	.461

Table 4: Summary of general linear model on the associations between education and income and external health locus of control

	B	SE	Beta	CI		P
Model 1						
Race	.23	.11	.04	.01	.45	.039
Male	.06	.06	.02	-.05	.178	.273
Age	.01	.00	.05	.00	.01	.014
Latino	-.13	.18	-.02	-.47	.22	.476
US Born	-.08	.15	-.01	-.37	.21	.600
Education (1-12)	-.11	.01	-.21	-.14	-.09	.000
Income	-.01	.00	-.11	.00	.00	.000
Model 2						
Race	1.27	.38	.25	.53	2.01	.001
Male	.07	.06	.03	-.05	.18	.246
Age	.01	.00	.05	.00	.01	.012
Latino	-.10	.18	-.01	-.44	.25	.587
US Born	-.09	.15	-.01	-.38	.20	.551
Education (1-12)	-.10	.01	-.19	-.13	-.08	.000
Income	-.01	.00	-.10	.00	.00	.000
Race x Education (1-12)	-.10	.05	-.16	-.21	-.00	.046
Race x Income	-.01	.00	-.06	.00	.00	.077

As shown by Table 3, high education was associated with higher internal health locus of control of individuals. However, this association was stronger for Whites than Blacks.

As shown by Table 4, high education was associated with lower external health locus of control of individuals. However, this association was stronger for Blacks than Whites.

Discussion

The aim of this study was to examine the complex interplay between SES, and internal and external health locus of control, overall and within different racial groups. Specifically, we investigated whether the effects of SES on health locus of control varied based on race. Given the unique constraints faced by racial minority groups, particularly Black individuals, we hypothesized that these relationships would be weaker for Blacks compared to Whites. Our study revealed that the relationships between high SES indicators such as income and education, and internal health locus of control were not consistent across racial groups. Consistent with the theory of minorities' diminished returns, we observed that high SES was associated with higher internal health locus of control and lower external health locus of control, indicating a stronger belief in personal control over life circumstances and health outcomes. However, these effects were moderated by race, as we found differences between Blacks and Whites. Despite similar levels of educational attainment and income, Black individuals exhibited less pronounced gains in terms of an increase in internal health locus of control compared to their White counterparts. This suggests that the positive effects of education and income as drivers of internal health locus of control were diminished for Black individuals who face significant structural constraints.

Our findings are consistent with existing research highlighting the importance of SES and health locus of control in shaping health outcomes, particularly among White individuals[6,38-40]. Previous studies have shown that higher SES is associated with an increased internal health locus of control and better health outcomes[41-43]. Similarly, an internal health locus of control has been linked to healthier behaviors, such as engaging in physical activity, adhering to a balanced diet, and effectively managing stress[44-46]. However, the literature has paid limited attention to racial disparities in health outcomes and the role of structural constraints, including systemic racism and socioeconomic disadvantages.

Our study contributes to the literature by demonstrating that the health effects of health locus of control and sense of mastery and control over life are weaker for Black individuals compared to White individuals. We have previously shown this phenomenon in other studies, including the protective effects of mastery for Whites but not Blacks against chronic disease incidence over time and mortality risk[28,29,47-50]. These findings align with the concept of MDRs, which suggests that high SES individuals from racial minority groups, such as high SES Blacks, often experience smaller health gains compared to their high SES White counterparts. These disparities can be attributed to various mechanisms, including lower financial security[51], higher stress levels[52], increased costs of social mobility[53,54], limited wealth accumulation[55], residing in disadvantaged neighborhoods[56], and heightened perceptions of

discrimination[57-60] among high SES Black individuals compared to their high SES White counterparts.

Consistent with the theory of minorities' diminished returns[20], high SES was associated with higher internal health locus of control and lower external health locus of control, indicating a stronger belief in personal control over life circumstances and health outcomes. However, these effects were moderated by race. Despite similar levels of educational attainment and income, Black individuals exhibited less pronounced gains in terms of an increase in internal health locus of control compared to their White counterparts. This suggests that the positive effects of education and income as drivers of internal health locus of control were diminished for Black individuals, who face significant structural constraints and experience learned helplessness from an early age. These findings emphasize the need for a deeper understanding of the unique challenges faced by racial minority populations and the development of interventions that address the structural constraints and systemic racism that contribute to health disparities. Policy and practice should prioritize structural interventions aimed at reducing racial disparities in health outcomes and promoting health equity among diverse populations.

Implications

The racialized patterns we identified have significant implications for policy and practice. Firstly, our findings suggest that the relevance of health locus of control and many psychological theories and constructs may be more applicable to White individuals, as the positive effects of SES on health locus of control and subsequent health outcomes may not be uniformly applicable across all racial groups. It is crucial to critically examine existing frameworks and develop interventions that address the unique experiences and challenges faced by racial minority populations, particularly Blacks. Our study underscores the importance of structural interventions aimed at reducing racial disparities in health. Individual-level interventions that focus solely on enhancing personal agency and control may be insufficient in mitigating health disparities. Instead, policies and practices should target the broader social and economic determinants of health, addressing structural barriers, systemic racism, and socioeconomic inequalities. Policies should enhance the environment and reduce barriers for high SES Blacks and Blacks with a high internal health locus of control.

Limitations

Several limitations should be acknowledged in our study. Firstly, the cross-sectional nature of our data prevents us from establishing causality or examining temporal associations. Longitudinal studies would be beneficial in unraveling the dynamic relationships between SES, health locus of control, and BMI over time. Additionally, our study focused on Black and White racial groups, and further research is needed to explore the experiences of other racial and ethnic minorities. We only tested one outcome, and future research should investigate these patterns for mental health, overall health, health behaviors, chronic disease, and mortality. Furthermore, we did not measure a wide range of determinants such as stress, diet, exercise, and neighborhood quality.

Conclusion

In conclusion, our study highlights the racialized links between SES indicators such as education and income, internal and external health locus of control, and BMI. The results demonstrate that the effect of SES on health locus of control is shaped by race. These findings emphasize the need to move beyond individual-level approaches and prioritize structural interventions to address health disparities. By recognizing and addressing the unique constraints faced by racial minority groups, we can work towards achieving health equity and fostering more inclusive and effective public health policies and practices.

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