

# ASSOCIATION BETWEEN INCOME AND OBESITY IN BLACK MEN: THE ROLE OF WORK-LIFE INTERFERENCE

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Obesity rates increase as household income increases among Black men, yet only a few studies have sought to understand this unique association. Scholars have posited that gendered stressors like role strain that are work-related could play a role in obesity among Black men. Work-life interference is a concept that captures the conflict between work life and family/personal life. Work-life interference is associated with obesity-related behaviors but has been understudied in Black men.

The aim of this study was to determine the interrelationship between work-life interference, income, and obesity among Black men. Using data from the 2015 National Health Interview Survey, the associations between household income and odds of overweight and obesity (measured by body mass index) were assessed using ordinal logit regressions. Multiplicative interaction terms were used to assess the potential moderation of the association between income and log-odds of overweight/obesity by work-life interference.

The results of our study demonstrate that work-life interference interacts with income  $\geq 400\%$  federal poverty level (FPL) on the log-odds of overweight/obesity (beta=2.10, standard error [se]=.87). Among those who reported work-life interference, Black men who had household income  $\geq 400\%$  FPL had higher log-odds of overweight/obesity (beta=1.51, se=.74) compared with those with income  $< 100\%$  FPL. There was no association between income and obesity among Black men who did not report work-life interference. The results suggest that work-life interference plays an important role in the positive association between income and obesity in Black men. Future studies should explicate the obesogenic ways in which work and family/

## INTRODUCTION

Concern over growing rates of obesity in the United States has been directed toward particular demographic groups.<sup>1</sup> Black women and those of other racial/ethnic groups are often the focus of obesity research and scholarship due to large disparities in overweight and obesity compared with White women. However, obesity rates among Black men have increased over time,<sup>1</sup> and racial differences in obesity have been of interest to Black men's health scholars.<sup>2,3</sup>

### Income and Obesity in Black Men

Socioeconomic status (SES) has long been implicated in racial health disparities.<sup>4,5</sup> Obesity rates tend to decrease with increasing SES,<sup>6</sup> however this association varies by race

and gender. Among Whites, there is a significant decline in obesity as SES increases, but among Blacks, the gradient is weaker.<sup>7</sup> Because of this, there is a larger racial difference in odds of obesity among Blacks and Whites within the highest SES group compared with those with the lowest SES.<sup>8</sup> Studies find that Blacks receive "diminished returns" of high SES on health compared with Whites.<sup>6,7</sup> Scholars suggest that increased exposure to racial discrimination and stressful environments experienced by Blacks with higher SES contributes to the diminished return of SES on health among Blacks.<sup>9</sup> Cole and Omari discuss "the cost of the ticket" to upward mobility and highlight unique forms of discrimination that middle class Blacks face.<sup>10</sup> Several studies have found that discrimination is associated with higher body

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personal life combine among high-income Black men. *Ethn Dis.* 2020;30(4):629-636; doi:10.18865/ed.30.4.629

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mass index (BMI)<sup>11</sup> and odds of obesity<sup>12</sup> among Black men. Scholars of the Black middle class point to the role of workplace environments and experiences of discrimination, suggesting that work-related discrimination and stress contributes to poorer health outcomes among higher SES Blacks.<sup>13</sup> Recent work by Hudson et al found that middle class Blacks report the stress of hypervisibility and thus hypervigilance in the workplace.<sup>14</sup>

There is a unique association between income and obesity among Black men. For most race-sex groups, obesity rates decrease with higher income, but for Black men, obesity rates increase with income.<sup>4</sup> Using nationally representative data from 2011-2014, a study found that obesity rates in Black men with household income that is <130% of the federal poverty level (FPL) was 33.8%.<sup>4</sup> Among Black men with incomes ≥350% FPL, the obesity rate was 42.7%.<sup>4</sup> For all other race-sex groups, there was either no association between income and obesity, or obesity rates decreased as income increased.<sup>4</sup> The positive association between income and obesity among Black men suggests that obesogenic factors may be uniquely experienced among higher income Black men. Because studies have demonstrated an association between vigilance and obesity among Blacks,<sup>15</sup> it is possible that the unique stressors that high-income Black men face in the workplace could contribute to higher obesity rates.

Scholars also posit that role strain plays a major role in higher obesity rates among high income Black men.<sup>10,16</sup> Broadly, role strain considers the stress and conflict related to

fulfilling various roles, and for men, gendered social roles like being the family provider are also connected with norms and expectations related to masculinity.<sup>16,17</sup> The Role Accumulation Hypothesis finds that having multiple social roles contributes to one's identity, and the quality of experience in these roles is associated with better health outcomes.<sup>18</sup> However, for Black men, the ability to fulfill multiple social roles, particularly that of provider, is hindered within a society that restricts employment opportunities and freedom for Black men.<sup>19</sup> Work-related social roles may be associated with worse health among Black men. Fulfilling the role of provider is intrinsically related to the ability to work and the work experience for Black men.<sup>17</sup>

Griffith, Gunter and Allen found that gender role strain was an important barrier to physical activity in Black men<sup>16</sup> and could contribute to obesity rates. Black men in this study reported that work, family, and community commitments were barriers to physical activity.<sup>16</sup> Studies have shown that marital status plays a major role in obesity among Black men.<sup>20,21</sup> Bell and Thorpe found that Black men who were married and had a high income tended to have higher odds of obesity.<sup>21</sup> The posited explanation was that high-income Black men may experience more stress from having to manage multiple identities and responsibilities related to work and family. Black men have reported gender and race-related role strain as an important source of stress,<sup>17</sup> and an additional role strain related to being a higher income Black man could contribute to obesity. A study

on stress in Black men by Griffith, Ellis and Allen found that work-related stress was most prevalent among Black men and that time was an important factor. Respondents reported stress due to working overtime and long commutes.<sup>17</sup> Black men in the study also reported that work- and family-related activities that were time-consuming were a source of stress.<sup>17</sup> This combination of work- and family-related stressors could be more acute for higher income Black men who may perceive that they have to commit more time and dedication to work given the discrimination experienced at work in terms of promotion and hiring<sup>17</sup> or hypervisibility.<sup>14</sup>

## **Work-Life Interference and Obesity**

Work-life interference is a concept that has received little attention in Black men's health but could play an important factor in understanding the positive association between income and obesity in Black men. Studies have shown that work-life interference is associated with obesity<sup>22</sup> and related health behaviors.<sup>23,24</sup> Work-life interference occurs when the demands of one's work domain conflict with the demands of other domains such as home, family, or other personal life.<sup>25</sup> Studies find that work-life interference is associated with less physical activity<sup>24</sup> and decreased consumption of fruits and vegetables.<sup>23</sup> Those who experience work-life interference may have less time for behaviors related to obesity like physical activity and avoiding unhealthy foods.<sup>26</sup> Studies also find that work-life interference is more prevalent in those with higher status

jobs,<sup>27</sup> and that work stress is more prevalent in those with higher SES.<sup>28</sup>

Work-life interference is thought to be a consequence of higher status stress such that those with higher work-related social status experience more autonomy, but longer hours and blurring of roles.<sup>27</sup> This aligns with literature on role strain and obesity in Black men<sup>3,16,17</sup> and work-related stress in upwardly mobile or high SES Blacks.<sup>10,13,14</sup> Scholars also suggest that work-life interference is a matter of the ability to create boundaries between work and non-work life and responsibilities.<sup>29</sup> Because of perceptions of discrimination and discrimi-

natory practices in the workplace,<sup>10,17</sup> higher income Black men may be less likely to have this ability, which could translate into greater work-life interference as well as the associated stress and time management that could lead to obesity-related behaviors and obesity. Understanding the associations between income and work-life interference among Black men may have implications for obesity in this group.

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The objective of this study was to determine whether the association

between income and obesity is moderated by work-life interference in Black men. Because Black men report stressors related to conflict between work-related factors and family,<sup>17</sup> it is hypothesized that the positive association between income and obesity in Black men will be stronger in those who report work-life interference compared with those who do not. Given the associations between obesity and other health outcomes like cardiovascular disease,<sup>30</sup> it is important to fully understand obesity in Black men, and the unique and complex manner in which social determinants may affect obesity rates in this group.

## Variables

Obesity was the dependent variable. Respondents reported their height and weight, and body mass index (BMI) was calculated as weight (kg) divided by height (cm<sup>2</sup>). Weight status was categorized as follows: healthy (BMI=18.0-24.0 kg/m<sup>2</sup>), overweight (BMI=25.0-29.9 kg/m<sup>2</sup>), Class I obesity (BMI=30.0-34.9 kg/m<sup>2</sup>), Class II obesity (BMI=35.0-39.9 kg/m<sup>2</sup>), and Class III obesity (BMI≥40.0 kg/m<sup>2</sup>). The main independent variable was household income as measured by percentage of the federal poverty line (FPL). Respondents reported their annual household income and their household size. From this, a score to represent the percentage FPL of each respondent was calculated. A value of 1.00 represented income that was 100% of the federal poverty line. A categorical variable was created as follows: <100% FPL, 100-199% FPL, 200-399% FPL, and ≥400% FPL.

The moderating variable was work-life interference. Respondents were asked the degree to which they agreed that the demands of their job interfere with their personal or family life. Responses were collected on a Likert scale, but were dichotomized such that those who agreed or strongly agreed that the demands of their job interfered with other areas of their life were given a value of "1" and others were given a value of "0."

## METHODS

### Data

The National Health Interview Survey (NHIS) is a nationally representative annual survey conducted by home interviews of study participants by the US Census Bureau for the National Center for Health Statistics.<sup>31</sup> The target population includes members of civilian and non-institutionalized households in the United States. The survey uses a multistage sampling design that includes stratification, clustering, and simple random sampling. The sample design oversamples African Americans, Hispanics, Asians, and persons aged ≥65 years. NHIS includes questions on demographic characteristics, health status, functional limitations, health behaviors, cancer screening, and health care access and utilization. In 2015, a module on occupational health was included. NHIS surveys a Sample Adult Core, which ran-

This measure is similar to that in other studies that assess the role of work-life interference in health outcomes.<sup>27</sup>

Covariates in the analyses included age, marital status, educational attainment, insurance status, self-rated health, psychological distress, drinking and smoking behavior, and physical activity. Age was measured continuously, while marital status was measured categorically to indicate whether a respondent was currently, formerly, or never married. Respondents were asked what their highest level of education was and a variable to categorically measure educational attainment was created. Categories included: not a high school graduate, high school graduate or GED equivalent, Associate's degree or some college, and Bachelor's degree or more. Respondents indicated whether they had health insurance or not. Respondents also were asked to assess their health as excellent, very good, good, fair or poor. A dichotomous variable was included to indicate fair or poor health. Psychological distress was measured by the Kessler-6 (K6). Developed for the National Center for Health Statistics, the K6 measures non-specific distress, and was included as a continuous variable. Those who reported currently consuming alcohol and/or smoking cigarettes were considered current drinkers and current smokers. Respondents who reported neither moderate nor vigorous physical activity were considered physically inactive.

### Statistical Analyses

The mean age and proportions of respondents within each category of all analytic variables were calculated.

**Table 1. Descriptive statistics among Black men, NHIS 2015**

Variable	
Age (years), mean ± SD	44.1 ± .5
Marital status, %	
Currently	73.7
Formerly	20.5
Never	5.8
Educational attainment, %	
Less than high school graduate	14.3
High school graduate/GED equivalent	33.0
Some college/Associate's degree	31.8
Bachelor's degree or more	20.9
Insured, %	85.1
Fair/poor self-rated health, %	16.3
Psychological distress, mean ± SD	2.90 ± .15
Current drinker, %	59.7
Current smoker, %	20.9
Physically inactive, %	30.6
Household income (percentage of the federal poverty line (FPL), %	
<100% FPL	17.0
100-199% FPL	23.4
200-399% FPL	30.8
≥400% FPL	28.9
Work-life interference, %	26.3
Weight category, %	
Healthy weight (BMI 18.0-24.9 kg/m <sup>2</sup> )	29.7
Overweight (BMI 25.0-29.9 kg/m <sup>2</sup> )	33.9
Class I obese (BMI 30.0-34.9 kg/m <sup>2</sup> )	21.4
Class II obese (BMI 35.0-39.9 kg/m <sup>2</sup> )	7.2
Class III obese (BMI ≥40 kg/m <sup>2</sup> )	7.8

NHIS, National Health Interview Survey

In Model 1, the association between household income and weight status categories was assessed adjusting for age using ordinal logit regression. Model 2 additionally adjusted for all other covariates, and Model 3 additionally adjusted for work-life interference. In Model 4, a multiplicative interaction term between household income and work-life interference was included to determine whether the association between household income and obesity varied by work-life interference. If the interaction

term was significant, the association between household income and obesity among those who reported work-life interference and those who did not report it was assessed. Following the procedure recommended by the National Center for Health Statistics,<sup>32</sup> all analyses in NHIS used Taylor-linearization procedures for the complex multistage sampling design and weighting requirements. P values less than .05 were considered statistically significant and all t tests were two-sided. All statistical

procedures were performed using STATA statistical software, version 14 (StataCorp LP, College Station, TX).

**RESULTS**

Table 1 presents descriptive statistics for the analytic sample of Black men in the 2015 NHIS. The mean age was 44.1 years (standard error=.49). About three-quarters of Black men were currently married (73.7%) and about one in five had a college degree (20.9%). More than 80% had health insurance (85.1%). About one in six men (16.3%) reported fair or poor health and the mean psychological distress score was 2.90 (±.15). Six in ten men (59.7%) reported being current drinkers while one in five reported being current smokers (20.9%). One third of men reported no physical activity (30.6%). Seventeen percent of respondents had household income that was <100% FPL, while about one in three (28.9%) had a household income that was ≥400% FPL. About one in four (26.3%) reported that work interfered with their personal or family life. About 30% of respondents had a BMI <25.0 kg/m<sup>2</sup>, while another third (33.9%) of respondents were considered overweight. About one in five (21.4%) had Class I obesity. Around 7% had Class II obesity and Class III obesity (7.2% and 7.8, respectively).

The association between household income and obesity is displayed in Table 2. In Model 1, adjusting for age, men with incomes between 200-399% FPL had .41 higher log-odds of overweight or obesity than men with income <100% FPL (beta=.41,

**Table 2. Association between income, work-life interference, and obesity in Black men, NHIS 2015**

	Model 1	Model 2	Model 3	Model 4
	beta (se)	beta (se)	beta (se)	beta (se)
Household income				
<100% FPL	---	---	---	---
100-199% FPL	.36 (.20)	-.17 (.29)	-.33 (.52)	-.72 (.60)
200-399% FPL	.41 (.20) <sup>a</sup>	.22 (.30)	-.03 (.52)	-.66 (.59)
≥400% FPL	.57 (.19) <sup>a</sup>	.38 (.29)	.27 (.48)	-.26 (.57)
Work-life interference			-.12 (.24)	-2.12 (.78) <sup>a</sup>
Household income × Work-life interference				
<100% FPL				---
100-199% FPL				1.52 (1.07)
200-399% FPL				2.51 (0.89) <sup>a</sup>
≥400% FPL				2.10 (0.87) <sup>a</sup>

a. P≤.05.

Model 1 adjusted for age. Models 2-4 additionally adjusted for marital status, educational attainment, insurance, self-rated health, psychological distress, current drinking status, current smoking status, and physical inactivity.

NHIS, National Health Interview Survey.

se=.20), and those with incomes ≥400% FPL .57 higher log-odds of higher odds of overweight or obesity (beta=.57, se=.19). However, after adjusting for all covariates in Model 2, there was no association between household income and obesity in Black men. In Model 3, there was no association between work-life interference and obesity in Black men, and there remained no association between household income and obesity. There was a significant interaction between having household income between 200-399% FPL (beta=2.51, se=.89) and ≥400% FPL (beta=2.10, se=.87) with work-life interference on obesity in Model 4.

In Table 3, the association between household income and obesity among Black men stratified by work-life interference is shown. Among those who report no work-life interference,

there is no association between household income and obesity. However, there is an association among those who do report work-life interference. Compared with men with household income <100% FPL, Black men who report work-life interference and have incomes between 200-399% FPL (beta=1.78, se=.87) and ≥400% FPL (beta=1.51, se=.74) had higher log-odds of overweight or obesity.

**DISCUSSION**

This study sought to determine whether work-life interference moderated the association between income and obesity among Black men. The results found that there was a positive association between income and obesity among Black men who reported that their work interfered



**Table 3. Association between income and obesity among Black men by work-life interference, NHIS 2015**

	No work-life interference	Work-life interference
	beta (se)	beta (se)
Household income		
<100% FPL	---	---
100-199% FPL	-.79 (.60)	.75 (.90)
200-399% FPL	-.60 (.61)	1.78 (.87) <sup>a</sup>
≥400% FPL	-.16 (.58)	1.51 (.74) <sup>a</sup>

a. P≤.05.

Model 1 adjusted for age. Models 2-4 additionally adjusted for marital status, educational attainment, insurance, self-rated health, psychological distress, current drinking status, current smoking status, and physical inactivity.

NHIS, National Health Interview Survey.

with personal or family life only. Among Black men who reported no work-life interference, there was no association between income and overweight or obesity. The results of this study demonstrate that work-related factors contribute to the unique association between income and obesity among Black men. This suggests that research on Black men and obesity must consider the multifaceted experiences of Black men that are related to the associations between SES and obesity in Black men.

We also found that there was no association between work-life interference and overweight or obesity among Black men, suggesting that the encroachment of work on family or personal life may have no impact on obesity-related behaviors such as diet or physical activity or stress related to weight status. Previous work on work-life interference and obesity-related outcomes found that work-life interference is associated with poorer dietary behaviors and less physical activity.<sup>23,24</sup> However, these studies were performed among mostly White study participants.<sup>24</sup> A report by Champagne et al (2012) of mostly

Black and Hispanic workers found that those who reported low control and time pressure also reported inability to consume healthier food options and pointed to the role of family responsibilities.<sup>33</sup> One of the possible pathways between work-life interference and obesity is through health behaviors like physical activity. Our current study controlled for physical inactivity and this could explain the difference in the results of our study compared with what was suggested by previous studies.

The results also found that income was not associated with overweight or obesity among Black men who reported no work-life interference. The positive association between income and overweight or obesity was only observed among Black men who reported that their work interfered with their personal or family life. Higher income Black men who report work-life interference may experience more chronic and/or acute stressors that could directly lead to weight gain and higher weight status. The confluence of psychosocial stressors due to being high-income and reporting work-life interference

could include more frequent experiences of discrimination in the workplace,<sup>10,13</sup> the need to manage and maintain racialized perceptions from others in the workplace<sup>14</sup> and time pressure related to working hours<sup>17</sup> among Black men. These particularly heightened stressors in high-income Black men who experience work-life interference could result in higher odds of obesity. Scholars find that, in general, there is a small, but positive association between perceived stress and obesity.<sup>34</sup> However, a study by Fowler-Brown et al found that psychosocial stress did not have an effect on BMI change among Black men.<sup>35</sup> Because of the potentially weak direct association between psychosocial stress and obesity among Black men,<sup>35</sup> it is possible that income and work-life interference could combine to produce increased odds of overweight or obesity among Black men through obesity-related behaviors.

Time availability may be an important factor for obesity-related health behaviors among Black men who report work-life interference and have higher incomes. Griffith et al found that Black men reported that the effort they exerted as family provider limited motivation for physical activity.<sup>16</sup> Work-life interference could be associated with role strain such that the increased demands at work are added to family responsibilities and roles. For Black men who report work-life interference, having higher income could be associated with overweight or obesity because high income could magnify the perceived importance of these work and family roles, and thus reduce motivation and time for physi-

cal activity and increase the odds of overweight or obesity. There may also be impacts on dietary behaviors, as there may be reduced time to prepare and consume healthy food options.

The results of our study have important implications. SES is an important social determinant of health and racial health disparities; the confounding of race and SES due to structural racism in the United States has limited SES among Blacks.<sup>5</sup> Because of this, scholars have tended to focus on poverty and the health

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*The results found that there was a positive association between income and obesity among Black men who reported that their work interfered with personal or family life only.*

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of lower income Blacks. However, with regard to obesity, higher income Black men have the highest rates.<sup>4</sup> The results of the current study suggest that stressors and obesity-related behaviors could be uniquely patterned among high-income Black men who experience work-life interference. The health of higher income Black men is understudied, and the results point to the need for the elimination of stressors and barriers to

obesity-related behaviors like physical activity and dietary behaviors experienced by high-income Black men.

This study is strengthened by use of a nationally representative sample; however, the results are not generalizable to other gender and racial/ethnic groups. Similar associations may not be observed among Black women or other racial groups. The study was cross-sectional; therefore, causal effects could not be assessed. The study used self-reported data on height and weight. The study also measured obesity with BMI. Other measures of adiposity like waist circumference could not be included.

## CONCLUSION

This study found that work-life interference moderated the association between income and overweight or obesity among Black men. There was a positive association between income and obesity among Black men who reported work-life interference, but there was no such association among those who reported no work-life interference. Future research should explicate the unique stressors and role strain of higher income Black men, particularly those who experience work-life interference. This may elucidate cardiovascular disease risk and other obesity-related outcomes among Black men and deepen the understanding of the varied and unique lived experiences of Black men across the SES spectrum.

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## CONFLICT OF INTEREST

No conflicts of interest to report.

## AUTHOR CONTRIBUTIONS

Research concept and design: Bell, Thorpe; Acquisition of data: Bell; Data analysis and interpretation: Bell; Manuscript draft: Bell, Thorpe; Statistical expertise: Bell; Supervision: Thorpe

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