HHS Public Access

Author manuscript

Am J Mens Health. Author manuscript; available in PMC 2016 May 18.

Published in final edited form as:

Am J Mens Health. 2011 May ; 5(3): 255–260. doi:10.1177/1557988310385447.

Weight Status and High Blood Pressure Among Low-Income African American Men

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Abstract

Obesity is a biological risk factor or comorbidity that has not received much attention from scientists studying hypertension among African American men. The purpose of this study was to examine the relationship between weight status and high blood pressure among African American men with few economic resources. The authors used surveillance data collected from low-income adults attending community- and faith-based primary care clinics in West Tennessee to estimate pooled and group-specific regression models of high blood pressure. The results from group-specific logistic regression models indicate that the factors associated with hypertension varied considerably by weight status. This study provides a glimpse into the complex relationship between weight status and high blood pressure status among African American men. Additional research is needed to identify mechanisms through which excess weight affects the development and progression of high blood pressure.

Keywords

obesity; overweight; high blood pressure; socioeconomic status

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Declaration of Conflicting Interests

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

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Introduction

Hypertension is a common medical disorder that is a risk factor for a number of cardiovascular morbidities including stroke, congestive heart failure, and end-stage renal disease. The incidence and prevalence of hypertension and hypertension-related conditions in the United States are disproportionately distributed across the population, affecting African Americans more than any other racial or ethnic group. The prevalence of hypertension in African Americans is currently among the highest in the world (Ferdinand & Armani, 2007; Jamerson, 2004). Hypertension is particularly salient for African American men as they are 1.5 times more likely to be hypertensive than White men (Gadson, 2006). Furthermore, epidemiologic studies indicate that these racial disparities continue to widen, and African Americans are more likely to develop hypertension at younger ages, have more severe forms of hypertension, and experience greater levels of target organ damage than their White counterparts (Douglas et al., 2003; Ferdinand & Armani, 2007; Webb & Gonzalez, 2006).

Scientific statements from organizations such as the American Heart Association demonstrate that hypertension can be linked to biological and nonbiological factors (American Heart Association, 2009). Obesity is a biological risk factor or comorbidity that has not received much attention from scientists studying hypertension among African American men. There has been a concomitant rise in hypertension and obesity among adults over the past decade, and the proportion of African American men who are classified as overweight or obese has increased substantially during this same period. Published analyses from the National Health and Nutrition Examination Survey from 1999 to 2004 indicate that African American men had the largest change in obesity prevalence of all groups in the study (Ogden et al., 2006). Currently, nearly three out of every four adult African American males can be classified as overweight or obese (American Heart Association, 2009; Ogden et al., 2006).

The relationship between weight status and hypertension is presumed to be linear; however, it is not clear how social health determinants (e.g., socioeconomic status) for this group affect this relationship. The purpose of this study was to examine the relationship between weight status and high blood pressure among low-income African American men. Surveillance data collected from low-income individuals attending community- and faith-based primary care clinics in West Tennessee were used to examine how weight status has implications for the patterning of associations between social, economic, health status, health behavior measures, and high blood pressure among African American men.

Method

Data for this study were drawn from a large surveillance study of low-income patients attending four community- and faith-based primary care clinics in Memphis, Tennessee, in 2000 and 2001. Adults in clinic waiting rooms were approached in a nonrandom manner to complete a survey. Individuals who gave informed consent, were aged 18 years and older, were patients at the clinic, were able to understand English or Spanish, and did not have a major cognitive impairment were eligible for the study. Once eligible individuals provided consent to participate in the study, they completed an interview-administered survey. Each interview lasted approximately 15 minutes and was administered in an examining room or private area in the waiting room.

Participants were asked to complete a five-page survey form developed to collect data on modifiable risk factors to compare data collected from the public clinic population in West Tennessee with national samples. As such, a substantial segment of items on the survey was based on questions found on the Behavioral Risk Factor Surveillance System (Centers for Disease Control and Prevention, 2000). These survey items were used to collect information about diagnosed chronic diseases (hypertension, diabetes, high cholesterol), health behavior practices (e.g., dietary practices, physical activity, smoking), and perceived ability to make behavioral changes to reduce their risks for chronic disease.

Study Variables

Primary outcome—All the variables used in the analyses were self-report measures. The primary dependent variable was drawn from a survey item asking respondents if they had ever been diagnosed with high blood pressure. More than one third of the analytic sample (36.47%) reported having hypertension. This prevalence is consistent with recent estimates reported by the American Heart Association (2009).

Independent variables—Weight status was a three-category measure based on body mass index (BMI) calculated from self-reported height and weight. The three categories were normal weight (BMI < 25), overweight (25 ≥ BMI < 30), and obese (BMI ≥ 30). Marital status, employment status, and educational attainment have been shown to have implications for health outcomes. The marital status and employment status measures were dichotomous variables indicating whether respondents were currently married or employed, respectively. The education measure was a continuous variable denoting the number of years of formal education completed by respondents.

Two types of health status variables were included in the analysis. The first type focused on perceived health status. Respondents were asked to rate their health as “excellent,” “very good,” “good,” “fair,” or “poor.” The perceived health status variable used in the analysis was derived by coding individuals rating their health as “fair” or “poor” as “1,” while all other response were coded “0.” Nearly 36% of the African American men in the study rated their health as “fair” or “poor.” Health status was also represented by two dichotomous variables indicating whether respondents reported being diagnosed with diabetes or high cholesterol.

Health behavior was represented by two variables. The first was a physical activity variable drawn from a survey item asking respondents to report the average number of days per week they engaged in at least 30 minutes of moderate exercise. “Moderate exercise” was defined as physical activity that brought about small increases in breathing or heart rate. The second health behavior measure was drawn from responses to the question, “Compared with people your age are you more active, less active, or the same?” The variable derived from this question was a dichotomous variable in which participants who reported to be “more active” were coded as “1” while all other responses were coded “0.”

Analytic Strategy

Study population characteristics were described overall by weight status strata using mean and standard deviation for continuous variables and proportions for categorical variables. *T* tests and chi-square tests were used in descriptive analyses assessing how normal weight, overweight, and obese men varied across key indicators. Multivariable logistic regression models were estimated to determine the degree to which the subgroup models differed from the pooled model and each other. All statistical analyses were conducted with StataSE Version 10.

Results

African American men represented approximately 12% of all respondents, resulting in a sample size of 595 individuals. An overall descriptive profile of the analytic sample is provided in Table 1. The prevalence of high blood pressure among this sample of African American men was 37% (n = 217). Nearly three out of four men in the study could be classified as overweight (n = 192, 32%) or obese (n = 242, 41%). Nearly one third of the participants were married (n = 182, 31%), and a majority of study participants were employed (n = 339, 57%). On average, respondents completed nearly 12 years of formal education (11.73). Approximately 15% of the study population (n = 90) reported having diabetes, and nearly a quarter of the men in this study (n = 140, 24%) reported having high cholesterol. Roughly 36% of the analytic sample (n = 213) rated their health as fair or poor. Respondents averaged 3.5 days of rigorous physical activity per week, and nearly half of the participants (n = 281 or 47%) reported being more active than others the same age.

Characteristics of the study population stratified by weight status are reported in Table 1. The proportions of African American men in the study who were married or employed were similar across weight status categories. Mean years of education did not vary significantly across groups. There were health status and health behavior differences across weight status categories. Obese participants had a greater percentage of respondents who reported their health to be fair or poor, having diabetes, and having high cholesterol. Obese participants had substantially lower levels of physical activity, and a lower proportion of individuals were more active relative to others their age than participants carrying less excess weight.

Table 2 depicts the results from overall and weight status–specific logistic models examining the association between select covariates and high blood pressure status. Obese men were more than twice as likely as normal weight men to report having high blood pressure (pooled/total model). The odds for married men having high blood pressure were more than twice the corresponding odds for unmarried men in the study. Men who rated their health as fair or poor were also found to be more than two times more likely to report having high blood pressure. Similarly, individuals with high cholesterol were two times more likely to have high blood pressure than participants who did not have high cholesterol. Being more active than others the same age was inversely related to high blood pressure. African American men in the study who reported being more active than others their age were nearly half as likely to report having high blood pressure than their counterparts who were just as or less active than others their age.

The statistically significant relationships reported in the overall model were consistent with extant literature. But most of these relationships did not hold across the weight-specific logistic models. Perceived health status was the only measure found to be correlated in the same direction with high blood pressure status in each subgroup model. Men who rated their health as fair or poor had considerably higher odds of having high blood pressure than their counterparts who perceived their health to be good, very good, or excellent. The demographic variables were not particularly robust; however, marital status and employment status were found to be statistically significant for obese and overweight men, respectively. Married participants who were obese were 2.4 times more likely to report having high blood pressure than their unmarried obese counterparts. Overweight employed respondents had substantially lower odds of having high blood pressure than overweight men who were unemployed.

The results associated with health status and health behavior also highlight variation among subgroups. Having high cholesterol was positively associated with high blood pressure status for all participants except those who were obese. Physical activity was found to have a significant relationship with high blood pressure status among overweight men. Each additional day of moderate physical activity per week lowers the likelihood of overweight participants having high blood pressure by 16%. Activity relative to others is statistically significant in all models; however, this measure is positively correlated with having high blood pressure among normal weight respondents while being inversely associated with high blood pressure status among overweight and obese men in the study.

Discussion

High blood pressure is a health condition that contributes to disproportionately high levels of premature morbidity and mortality among African American men. Weight status has been thought to be related to a number of cardiovascular morbidities; however, the relationship between excess weight and adverse health outcomes among African American men has been underexplored. For this reason, data from a sample of low-income African American men were analyzed to explore the relationship between weight status and high blood pressure. Our results indicate that weight status is related to high blood pressure status among African American men. The odds of having high blood pressure among obese men in the study are more than two times greater than the corresponding odds for normal weight participants. This finding is consistent with the general idea that excess weight is associated with high blood pressure (Ogden, Yanovski, Carroll, & Flegal, 2007). However, it is noteworthy that the likelihood of having high blood pressure among overweight men was not significantly different from the likelihood of normal weight men having high blood pressure. These results suggest that the relationship between body weight and health outcomes among African American men may be complicated and require researchers to consider potential nonlinear relationships between weight status and health conditions such as high blood pressure.

The results reported in the overall model in Table 2 also indicate perceived health status, high cholesterol, and being more active relative to others the same age were found to be associated with having high blood pressure. It is not particularly surprising that health status and health behavior measures were statistically significant given that the state of one's health and activity level have been known to be correlated with high blood pressure and other cardiovascular outcomes (American Heart Association, 2009). The relationship between marital status and high blood pressure status, however, was a surprise worth noting. Married men in the sample were more than twice as likely to report having high blood pressure as their unmarried counterparts. It is also important to note that marital status is an indicator of social support (Bruce et al., 2009; Eng, Rimm, Fitzmaurice, & Kawachi, 2002). The analytic sample comprises low-income African American men, and it has been asserted that family can be a source of stress for males who cannot provide financial security (Bruce, Roscigno, & McCall, 1998). This complicated finding highlights the need for research to examine how social relationships interact with other environmental factors to affect the health of individuals at risk for high blood pressure and other cardiovascular morbidities.

The subgroup analyses reported in Table 2 suggest that the manner in which demographic, health status, and health behavior measures are related to high blood pressure can vary by weight status. The results for normal weight men in the study indicate that fair or poor perceived health status, having high cholesterol, and being more active than others same age are associated with greater odds of having high blood pressure. The results for the perceived health status and high cholesterol measures were congruent with research specifying correlates with cardiovascular disease–related outcomes (Bruce, Sims, Miller, Elliott, & Ladipo, 2007; Taylor et al., 2010). Normal weight individuals who were more active than others the same age were nearly three times more likely to have high blood pressure than their counterparts who were just as or less active than others same age. It may be the case that normal weight men who are highly active may be engaged in activities (i.e., multiple jobs, lower paying jobs, underground economy jobs) that are stressful and/or lower their capacity to rest and eat properly. Additional research is needed to explore the relationship between activity level and health outcomes among African American men.

The model for overweight low-income African American men is more robust than the other subgroup models. Like the normal weight model, fair or poor perceived health status and high cholesterol were positively correlated with high blood pressure status. The results in this subgroup model also indicated that overweight men who were employed, physically active, and/or more active than others the same age were less likely to report high blood pressure than their counterparts who were unemployed, not physically active, and/or just as or less active than others same age. The employment odds coefficient is noteworthy because research has shown that employment can be a stressor that can lead to adverse cardiovascular outcomes (Everson-Rose & Lewis, 2005). Employment can be a scarce resource among economically challenged populations. Earning wages from legitimate work can provide access to protective resources typically not available to those who are not employed. As such, having a job may reduce stress among disadvantage groups. Additional research is required to determine how employment-related factors are associated with weight status with regard to high blood pressure and other adverse health outcomes among marginalized populations such as African American men.

The results reported in the obese model underscore the need for additional research investigating the relationship between weight status and high blood pressure among at-risk populations. Years of education and marital status are shown to be positively correlated with high blood pressure status. According to the obese model in Table 2, the odds of having high blood pressure increases with each additional year of education. This result suggests that a mismatch between education and income can have implications for adverse outcomes among obese African American men. It may be the case that obese men have a heightened sensitivity to stress associated with being both highly educated and poor that increases their risk for high blood pressure. Similarly, being married may be stressful for obese men because the excess weight can limit their ability to perform traditional masculine roles (e.g., breadwinner). Further investigation is needed to explore the relationship between weight status, masculinity, high blood pressure, and other cardiovascular outcomes among African American men.

This study is significant because it demonstrates how subgroup analyses can highlight patterns of relationships masked in pooled models. This research contributes to our understanding of the relationship between obesity and high blood pressure among African American men; however, there are some limitations worth noting. The analytic models are estimated using data drawn from a sample of low-income African American men who reside the South and attend primary care clinics; therefore, the results are not generalizable to all African American men or low-income men from other racial/ethnic groups. The models in this study were estimated using cross-sectional data, which do not allow for the specification of temporal events or determination of causal inferences. Furthermore, age data were not collected in any form, thereby limiting our ability to draw inferences about the relationship between marital status and high blood pressure, for example. The survey data do not include information on dietary patterns, such as sodium and fat intake, which may contribute to hypertension and obesity. All the usual limitations associated with self-report data apply (Bruce et al., 2007).

The use of an all African American sample may be considered a limitation because it lacks a comparison group. However, there is evidence that the factors associated with African American health outcomes can differ substantially from other groups. The results from this study provide deeper insight into high blood pressure among African American men because the models reflect the considerable heterogeneity that exists within this subset of the African American population that is often neglected in comparative studies.

Conclusion

This study provides a glimpse into the complex relationship between weight status and high blood pressure status among African American men. Further analysis is need to explore how psychosocial mediators (i.e., stress, depression, anxiety) may affect the association of weight status with high blood pressure. Additional research is needed to specify the manner through which excess weight and weight gain amplifies the development and progression of cardiovascular outcomes such as high blood pressure. A more nuanced understanding of this relationship among groups such as African American men would enable health care providers and officials to develop culturally and context-specific programs and interventions to help at-risk individuals manage their environments and behaviors to reduce risks for high blood pressure and other cardiovascular comorbidities.

Acknowledgments

Funding

This research was supported by career development awards from NHLBI to Jackson State University (1 K01 HL88735-01–Bruce) and the University of Mississippi Medical Center (1 K01 HL084682-01-Sims).

References

American Heart Association. Heart disease and stroke statistics—2009 update. Dallas, TX: Author; 2009.

Bruce MA, Beech BM, Sims M, Brown TN, Wyatt SB, Taylor HA, Crook ED. Social environmental stressors, psychological factors, and kidney disease. Journal of Investigative Medicine. 2009; 57:583–589. [PubMed: 19240646]

Bruce MA, Roscigno VJ, McCall PL. Structure, context, and agency in the reproduction of Black on Black violence. Theoretical Criminology. 1998; 2:29–55.

Bruce MA, Sims M, Miller S, Elliott V, Ladipo M. One size fits all? Race, gender and body mass index among U.S. adults. Journal of the National Medical Association. 2007; 99:1152–1158. [PubMed: 17987919]

Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System survey questionnaire. Atlanta, GA: Author; 2000.

Douglas JG, Bakris GL, Epstein M, Ferdinand KC, Ferrario C, Flack JM. Management of high blood pressure in African Americans: Consensus statement of the Hypertension in African Americans Working Group of the International Society on Hypertension in Blacks. Archives of Internal Medicine. 2003; 163:525–541. [PubMed: 12622600]

Eng PM, Rimm EB, Fitzmaurice G, Kawachi I. Social ties and change in social ties in relation to subsequent total and cause-specific mortality and coronary heart disease incidence in men. American Journal of Epidemiology. 2002; 155:700–709. [PubMed: 11943687]

Everson-Rose SA, Lewis TT. Psychosocial factors and cardiovascular diseases. Annual Review of Public Health. 2005; 26:469–500.

Ferdinand KC, Armani AM. The management of hypertension in African Americans. Critical Pathways in Cardiology: A Journal of Evidence-Based Medicine. 2007; 6:67–71.

Gadson SL. The third world health status of Black American males. Journal of the National Medical Association. 2006; 98:488–491. [PubMed: 16623060]

Jamerson KA. The disproportionate impact of hypertensive cardiovascular disease in African Americans: Getting to the heart of the issue. Journal of Clinical Hypertension (Greenwich). 2004; 6(Suppl 1):4–10.

Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999–2004. Journal of the American Medical Association. 2006; 295:1549–1555. [PubMed: 16595758]

Ogden CL, Yanovski SZ, Carroll MD, Flegal KM. The epidemiology of obesity. Gastroenterology. 2007; 132:2087–2102. [PubMed: 17498505]

Taylor HA, Coady SA, Levy D, Walker ER, Vasan RS, Liu J, Fox C. Relationships of BMI to cardiovascular risk factors differ by ethnicity. Obesity. 2010; 18:1638–1645. [PubMed: 19927137]

Webb MS, Gonzalez LO. The burden of hypertension: Mental representations of African American women. Issues in Mental Health Nursing. 2006; 27:249–271. [PubMed: 16484169]

Table 1

Characteristics of Low-Income Men in West Tennessee by Weight Status

		Weight Status			
Characteristics	**Overall Sample (*N* = 595)**	**Normal (BMI < 25), *n* = 161**	**Overweight (25 ≥ BMI < 30), *n* = 192**	**Obese (BMI ≥ 30), *n* = 242**	***p* Value**
Married (%)	30.59	31.68	31.25	29.34	.86
Employed (%)	56.64	52.17	61.46	55.79	.20
Years of education, mean (*SD*)	11.73 (2.51)	11.62 (2.59)	11.73 (2.64)	11.79 (2.35)	.80
Fair or poor health status (%)	35.80	34.78	25.00	45.04	.001
Diabetes (%)	15.13	4.97	14.06	22.73	.001
High cholesterol (%)	23.53	14.29	19.79	32.64	.001
Moderate physical activity *days/week*, mean (*SD*)	3.53 (2.42)	3.98 (2.43)	3.53 (2.33)	3.22 (2.44)	.007
More active than others same age (%)	47.23	54.04	51.56	39.26	.005
High blood pressure (%)	36.47	24.84	29.69	49.59	.001

Note. BMI = body mass index.

Table 2

Models of Relationship Between High Blood Pressure and Socioeconomic Status, Health Status, and Health Behavior Factors Among Normal Weight, Overweight, and Obese Low-Income African American Men in West Tennessee (N = 595)

Variable	All, OR (95% CI)	Normal Weight, OR (95% CI)	Overweight, OR (95% CI)	Obese, OR (95% CI)
Married	2.17 (1.45, 3.25)	2.26 (0.94, 5.49)	2.14 (0.99, 4.63)	2.43 (1.30, 4.55)
Employed	0.71 (0.49, 1.05)	0.63 (0.26, 1.49)	0.39 (0.19, 0.82)	0.87 (0.49, 1.55)
Years of education	1.04 (0.96, 1.11)	0.88 (0.76, 1.03)	1.06 (0.92, 1.21)	1.17 (1.03, 1.33)
Fair or poor perceived health status	2.75 (1.86, 4.06)	3.63 (1.52, 8.63)	2.76 (1.27, 5.99)	2.67 (1.48, 4.82)
Diabetes	1.49 (0.89, 2.48)	4.36 (0.72, 26.2)	0.77 (0.29, 2.08)	1.80 (0.91, 3.57)
High cholesterol	2.11 (1.38, 3.25)	6.04 (2.06, 17.7)	2.40 (1.05, 5.54)	1.62 (0.88, 2.99)
Moderate physical activity, days/week	0.98 (0.90, 1.05)	0.95 (0.80, 1.13)	0.84 (0.72, 0.98)	1.05 (0.93, 1.18)
More active than others same age	0.64 (0.44, 0.94)	2.91 (1.17, 7.20)	0.34 (0.16, 0.71)	0.52 (0.29, 0.94)
Normal weight (BMI < 25)	1.00			
Overweight (25 ≥ BMI < 30)	1.35 (0.81, 2.25)			
Obese (BMI ≥ 30)	2.36 (1.46, 3.82)			
p Trend	.001			

Note. All = total sample of African American men; OR = odds ratio; CI = confidence interval; BMI = body mass index.