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Author manuscript

Biodemography Soc Biol. Author manuscript; available in PMC 2018 April 08.

Published in final edited form as:

Biodemography Soc Biol. 2017 ; 63(3): 253–261. doi:10.1080/19485565.2017.1353406.

Association between discrimination and obesity in African-American men

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Abstract

The objective of this study was to examine the association between discrimination and obesity among a U.S. nationally representative sample of African-American men. Data from the 2001–2003 National Survey of American Life (NSAL) were used to collect measures of everyday and major discrimination, and body mass index (BMI) taken from self-reports. Poisson regression with robust standard errors was applied to estimate the prevalence ratios of everyday and major discrimination as it relates to obesity (BMI ≥ 30 kg/m^2), controlling for potential confounders. In the model that included both everyday and major discrimination, men who experienced any major discrimination had a higher likelihood of obesity (prevalence ratio [PR] = 1.33, 95% confidence interval [CI], 1.06, 1.66) than those who did not experience any major discrimination, controlling for age, marital status, income, education, major stressors, two or more chronic conditions, and physical activity. Exposure to any major discrimination was found to be associated with obesity in African-American men. Future studies among this population are needed to examine whether the observed changes in self-reports of major discrimination are associated with obesity, measured by BMI, over time. The health of African-American men must be a priority in reducing excess disparities in disease, disability, and death.

Introduction

Obesity is a major public health problem and a well-established precursor to a number of adverse health conditions and outcomes (Du Plessis et al. 2010; Griffith et al. 2011; Kelley et al. 2016; Thorpe et al. 2015; Warner and Hayward 2006) The overall rate of obesity in adults in the United States changed little from 1999 to 2010, but data analyses from the latest National Health and Nutrition Examination Survey (NHANES) suggest an increased prevalence among non-Hispanic black men (Flegal et al. 2012). From 2009 to 2010, the age-adjusted prevalence of obesity (body mass index [BMI] ≥ 30) for all men was 35.5% (95% CI, 31.9%, 39.2%), while the age-adjusted prevalence of obesity was 36.2% (95% CI,

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31.8%, 40.8%) for non-Hispanic white men compared to 38.8% (95% CI, 33.9%, 43.9%) for non-Hispanic black men (Flegal et al. 2012). The difference in prevalence between these two racial groups of men, while small, shows that rates are not declining and may be attributable to factors that are complex, multifactorial, and persistent (Bruce et al. 2007). A popular approach to addressing such factors is through a lens focusing social determinants of health (SDOH). This provides an opportunity to consider factors and conditions in which individuals live, play, worship, and work. SDOH brings context and experiences of individuals that are often times distal in relation to understanding the impact of health among certain groups. In this study, one SDOH that could provide a better understanding of the prevalence of obesity among African-American men is discrimination. Yet relatively little attention has been devoted to understanding how unique historical, social, and political experiences such as discrimination impact obesity in black men.

Self-reports of discrimination have been presumed to be a major risk factor for health decline (Hunte and Williams 2009; Lewis et al. 2011, Williams and Mohammed 2009; Williams 2015) and may be related to obesity among African-American men. Experiences of discrimination, observed through the dysregulation of the hypothalamic–pituitary–adrenal (HPA) stress axis in response to constant adaptations to psychosocial challenges, have been postulated to result in negative health outcomes including obesity (Bjorntorp 2001, 1991). Previous research has demonstrated the association between several forms of discrimination and obesity-related measures among U.S. adult samples (Gee et al. 2008; Hunte 2011; Hunte and Williams 2009; Lewis et al. 2011; Vines et al. 2007). In spite of African-American men's disproportionate experiences with discrimination (Krieger and Sidney 1996; Williams 2015, 2003), a paucity of studies remain that examine the association between discrimination and the trend of obesity in African-American men (Parker and Hunte 2013).

The study by Parker and Hunte (2013) demonstrated that internalized discrimination, the endorsement of racial/ethnic stereotypes, was associated with obesity among African-American men (Parker and Hunte 2013). Though prior research offers insight on the effect that African-American men's perception of their identity has on their obesity status, it is unclear if everyday discrimination (e.g., being treated with less courtesy) or major discrimination (e.g., being unfairly treated/abused by police) operate in the same way. The purpose of this study is to determine the association between everyday and major discrimination and obesity using a national sample of African-American men. We hypothesized that experiences of discrimination, compared to no experiences, will be associated with obesity among African-American men.

Methods

Sample

The National Survey of American Life (NSAL) is a cross-sectional study designed to understand how intra- and inter-group racial and ethnic differences in mental health outcomes operate in the presence of a number of types of stressors, risk and resilient factors, and coping resources in adult and adolescent samples. Conducted by the Program for Research on Black Americans (PRBA) within the Institute for Social Research at the University of Michigan in Ann Arbor, the NSAL represents a national household probability

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sample of African-American (n = 3,570), black Caribbean (n = 1,438), all other Hispanics (n = 183), and non-Hispanic white (n = 891) adults aged 18 years and older (Jackson et al. 2004a). Data collection, which took place between February 2001 and March 2003, consisted of face-to-face and telephone interviews. The overall interview response rate was 72.3% (Jackson et al. 2004a). Additional information on the sampling design and procedures of the NSAL can be found elsewhere (Heeringa et al. 2004; Jackson et al. 2004a, 2004b). There were 6,082 NSAL participants. However, for this study the following were excluded: women (n = 3,796); men who reported their race/ethnicity or ancestry as all other Hispanic (n = 81), Afro-Caribbean (n = 562), or non-Latino white (n = 372); and men who did not have complete information on their BMI (n = 62). This resulted in an analytic sample of 1,209 African-American men ages 18 and older.

Study measures

Obesity—The outcome variable for this study was obesity. Body mass index (BMI) was derived by dividing self-reported weight in kilograms by height in meters squared. A binary variable was created to identify men who were obese (BMI ≥ 30 kg/m^2).

Discrimination—Two measures of discrimination—everyday and major—were the main independent variables in this study. Everyday discrimination was based on the 10-item Everyday Discrimination Scale. This scale was created to assess interpersonal forms of unfair treatment (Williams et al. 2008). Men reported if they were: (1) treated with less courtesy, (2) treated with less respect, (3) received poor restaurant service, (4) being perceived as not being smart, (5) being perceived as dishonest, (6) being perceived as not as good as others, (7) being feared, (8) being insulted, (9) being harassed, and (10) being followed in stores. The value of the responses included: 0 (never), 1 (less than once a year), 2 (a few times a year), 3 (a few times a month), 4 (at least once a week), and 5 (almost every day). After reverse coding the response options, responses were summed across the 10 items to produce a summary scale where higher scores represented higher levels of everyday discrimination. Based on exploratory analyses, the distribution of everyday discrimination was skewed. Therefore, following the work of previous investigators (Hunte and Williams 2009; Schulz et al. 2006), a binary variable was created to identify men who reported at least one experience of everyday discrimination relative to men who did not report any experiences of everyday discrimination (1 = yes, 0 = no).

Major discrimination was based on the nine-item Major Experiences of Discrimination Scale (Williams et al. 2008). Men reported if they were ever unfairly: (1) fired, (2) not hired, (3) denied promotion, (4) treated/abused by police, (5) discouraged from continuing education, (6) prevented from moving into a neighborhood, (7) had life made difficult by neighbors, (8) denied a loan, or (9) received poor service from a repairman. The choices for responses were yes or no. A scale was created by summing across the nine items. With scores ranging from 0 to 9, higher scores signify additional experiences with major discrimination. Because exploratory analyses revealed the distribution of major discrimination was non-normal, a binary variable was created to identify men who reported at least one experience of major discrimination relative to men who did not report any experiences of major discrimination (1 = yes, 0 = no).

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Covariates—Based on prior work (Hunte 2011; Hunte and Williams 2009; Lewis et al. 2011, Parker and Hunte 2013), the covariates for this study included demographic variables, major stressors, physical activity, and chronic conditions. Demographic variables included age (in years), marital status (1 = married; 0 = not married), household income (1 = < $30,000; 0 = > $30,000), and education (1 = high school graduate or more; 0 = less than high school graduate). Major stressors were assessed by asking men to report if in the past month they had problems with: (1) health, (2) money, (3) job, (4) children, (5) marriage, (6) being a crime victim, (7) the police, (8) love life, and (9) their race. The response items were yes or no. Affirmative responses were summed across the nine items to obtain a count of major stressors (0–9). Higher scores represent more experiences with major stressors in the past month. Because of the non-normal distribution, a dichotomous variable was created to identify those men who reported any major stressors versus those who did not report any major stressors. Physical activity was assessed using a continuous physical activity scale to determine the frequency of gardening, walking, and exercising (0–9). Higher scores on the scale represent higher frequency of engaging in gardening, walking, and exercising. Our measure of chronic conditions derives from respondents' self-reported history of physician-diagnosed chronic health conditions from the following list: arthritis, cancer, hypertension, diabetes, kidney disease, stroke, asthma, and heart attack. A binary variable was created for each of the chronic conditions. We summed across the chronic conditions to create a total number of chronic conditions each man reported. A dichotomous variable was created to classify men who reported two or more chronic conditions versus those who reported fewer than two chronic conditions.

Statistical analysis

Means with corresponding standard errors and proportions were generated to describe the total sample. Mean and proportional differences were compared between everyday and major discrimination status and demographic factors, major stressors, physical activity, chronic conditions, and obesity by using adjusted Wald tests and Pearson chi squared tests. Because the outcome, obesity, was considered to be common (> 10%), modified Poisson regression with robust standard errors was used to estimate prevalence ratios and corresponding 95% confidence intervals for the relationship between discrimination and obesity (Zou 2004; McNutt, Wu, Xue, and Hafner 2003). Three models were specified: model 1 examined the association between any everyday discrimination and obesity, model 2 examined the relationship between any major discrimination and obesity, and model 3 examined the association of any everyday and any major discrimination on obesity. All of the models controlled for the covariates described above. The appropriate weights and design factors were invoked in all of the analyses to account for the multistage probability sampling design of NSAL (Heeringa et al. 2004; Jackson et al. 2004a, 2004b). P values less than .05 were considered significant. All of the analyses were performed using STATA version 13 (StataCorp LP, College Station, TX).

Results

The distribution of the select characteristics of African-American men for the total sample and by everyday and major discrimination status is displayed in Table 1. Of the 1,209 men,

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an overwhelming majority (91.9%) of the men reported experiencing some aspect of everyday discrimination and 70.1% reported experiencing some form of major discrimination. Most of the men had at least a high school education and also reported any major stressors. About half of the sample was married; less than half the sample had household incomes less than $30,000, reported two or more chronic health conditions, and was obese. On average the men were 42 years old and reported a physical activity score of 7. With regard to examining the attributes of the men by report of any everyday discrimination status, African-American men who reported some aspect of everyday discrimination were younger, more likely to report any major discrimination, and more likely to report any major stressors than African American men who did not report any aspects of everyday discrimination. There were no differences by any everyday discrimination status observed for being married, having a household income < $30,000, being a high school graduate or more, reporting two or more chronic health conditions, the frequency of engaging in physical activity, and being obese. When examining the characteristics of the men by report of any major discrimination status, African-American men who reported some form of major discrimination were more likely to report experiences of any everyday discrimination, any major stressors, and being obese than African-American men who did not report any form of any major discrimination. There were no differences by any major discrimination status observed for age, being married, having a household income < $30,000, being a high school graduate or more, reporting two or more chronic health conditions, and the frequency of engaging in physical activity.

The association between everyday and major discrimination and obesity among African-American men is shown in Table 2. After adjusting for age, marital status, income, education, major stressors, physical activity, and two or more chronic health conditions in model 1, men who experienced any everyday discrimination had a similar likelihood of obesity (prevalence ratio [PR] = 1.27, 95% CI [0.83, 1.94]) than those who did not experience any everyday discrimination. When examining the relationship of any major discrimination and obesity in model 2, men who experienced any major discrimination had a 35% higher likelihood of obesity (PR = 1.35, 95% CI [1.07, 1.69]) than those men who did not experience any major discrimination independent of potential con-founders. In model 3, when estimating the relationship between both any everyday discrimination and any major discrimination on obesity controlling for potential con-founders, men who experienced any major discrimination had a higher likelihood of obesity (PR = 1.33, 95% CI [1.06, 1.66)] than those who did not experience any major discrimination.

Discussion

Exploring the relationship between psychosocial stressors and health outcomes is a critical step to understanding disease processes. In this study, we examined the relationship between everyday and major discrimination and obesity among a national sample of African-American men. Using data from the NSAL, it was found that African-American men who reported any major discrimination had a higher likelihood of being obese than African-American men who did not report any major discrimination independent of everyday discrimination and adjusting for age, marital status, household income, education, two or more chronic health conditions, any major stressors, and physical activity. Similarly

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controlling for the aforementioned potential confounders, it was found that African-American men who report any major discrimination have a higher likelihood of being obese than African-American men who did not report any major discrimination. However, African-American men who reported any everyday discrimination had a likelihood of being obese similar to that of African-American men who were not exposed to any form of everyday discrimination net of potential confounders. These findings provide evidence that the consequences of major discrimination extends to obesity in African-American men. In addition, they underscore the importance of examining how psycho-social stressors, namely discrimination, can impact obesity and its persistence over time among this understudied group of men.

The nonsignificant outcome of the relationship between everyday discrimination and obesity among African-American men is consistent with a previous study that examined this relationship among non-Hispanic blacks (Hunte and Williams 2009) in the Chicago Community Adult Health Study. Unlike the Hunte and Williams study (2009), our result for African-American men was in the expected direction. A likely reason for not reaching significance is due to an insufficient sample size. This is evidenced by the wide confidence interval associated with the any experience of everyday discrimination variable. Another likely explanation is that there is a very high prevalence of any everyday discrimination (91.9%) among African-American men in this study. This has the potential to complicate our efforts to understand the relationship between any everyday discrimination and obesity. Additional work is needed, including considering alternative functional forms of everyday discrimination, to explicate this relationship in this segment of the population.

The relationship between major discrimination and obesity was significant and supported our hypotheses. African-American men who reported experiences of any major discrimination had a higher likelihood of obesity than African American men who did not report any experiences of major discrimination. This finding provides a link between major discrimination—a psychosocial stressor—and obesity among African-American men. Although the biological pathway from psychosocial stress and obesity is not completely understood, other investigators have hypothesized that obesity may be a consequence of the deregulation of the HPA axis (Hunte 2011; McEwen and Stellar 1993). In addition, investigators have posited that sustained and persistent external challenges to the physiologic system may change the normal physiologic stress reaction mechanism thereby leading to adverse health outcomes, including obesity (Hunte 2011; Hunte and Williams 2009; Brunner, Chandola, and Marmot 2007; McEwen and Stellar 1993). Future work should seek to examine the biological mechanism linking everyday and major discrimination to obesity among African-American men.

There are aspects of this study that warrant comment. NSAL is a cross-sectional study, therefore inferences cannot be made regarding causality between obesity and major discrimination. A prospective study is required to understand how discrimination influences the development of obesity over time. Additional studies should also consider other psychosocial factors that might impact both major discrimination and obesity. One example is masculinity. Very little work has focused on masculinity, discrimination, and obesity. Future studies should consider examining the biomarkers for psychosocial stress that might

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elucidate the biological pathway that links the relationship between major discrimination and obesity. This study included only African-American men because of the historical and contemporary experiences of discrimination towards this group in the U.S. Additional research is needed to understand the relationship between discrimination and obesity in Afro-Caribbean men. Height and body weight were self-reported in this study, but self-reported height and body weight bias does not vary by race/ethnicity (Ezzati et al. 2006; Li et al. 2012). Indeed, percentage of body fat and waist circumference might be better measures to document obesity (Sumner et al. 2007) but were not included in this study. Furthermore, BMI has been shown to be highly correlated with percentage of body fat, but it does not distinguish fat and lean tissue (Flegal et al. 2010).

This study had the following strengths. The authors are unaware of any other study that has examined the relationship between everyday and major discrimination and obesity in a national sample of African-American men. NSAL provided an excellent opportunity to explore this relationship in a sample of African-American men that included a variety of psychosocial factors and stressors.

This study offers some evidence that obesity is associated with major discrimination in African-American men and begins to fill a gap in the current obesity literature. Future work should focus on factors, specifically biomarkers, that might mediate this relationship. Both obesity and discrimination are complex and carry negative physical and psychological consequences, requiring a multidisciplinary research team of social scientists and biomedical researchers.

Acknowledgments

Funding: Research support was funded by grant #P60MD000214 from the National Institute on Minority Health and Health Disparities (NIMHD) of the National Institutes of Health. The second author was funded by the National Institute on Drug Abuse, Drug Epidemiology training grant T32DA007292. The third author was supported by the National Institute on Aging at the National Institutes of Health (grant numbers T32-AG000037 and P30AG017265).

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Table 1

Distribution of select characteristics of 1,209 African-American men in the National Study of American Life for the total sample and by everyday discrimination and major discrimination status.

		Any Everyday Discrimination		Any Discrim Major ination	
Variable	**Full Sample**	**Yes**	**No**	**Yes**	**No**
Any Everyday Discrimination (%)	91.9			95.1	84.3 *
Any Major Discrimination (%)	70.1	72.5	42.4 *		
Age (years), mean (*SE*)	41.8 (0.7)	41.2 (0.7)	48.5 (2.1) *	41.8 (0.1)	41.8 (1.2)
Married (%)	49.9	49.5	54.6	50.8	47.3
Household Income (%)					
< $30,000	42.9	42.3	49.4	42.0	45.4
Education (%)					
High School Graduate or More	77.3	78.0	68.4	79.2	72.6
Two or More Chronic Health Conditions (%)	22.3	22.0	27.7	23.9	18.8
Any Major Stressors (%)	69.4	70.9	51.9 *	77.1	51.3 *
Physical Activity (0–9), mean (*SE*)	7.2 (0.1)	7.2 (0.1)	7.1 (0.2)	7.1 (0.1)	7.2 (0.1)
BMI ≥ 30 kg/m^2 (%)	29.2	29.8	23.3	32.0	22.7 *

Note. All estimates account for the multistage probability sampling design by applying the appropriate weights and design factors. SE = standard error. Chronic health conditions include arthritis, cancer, hypertension, diabetes, kidney disease, stroke, asthma, and heart attack. Major stressors include reporting in the past month if respondents had problems with health, money, job, children, marriage, being a crime victim, the police, love life, and their race.

* $p < .05$.

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Table 2

Prevalence ratios and 95% confidence intervals for the relationship between discrimination and obesity among 1,209 African-American men in the National Survey of American Life.

	Model 1		Model 2		Model 3	
	PR	**95% CI**	**PR**	**95% CI**	**PR**	**95% CI**
Any Everyday Discrimination	1.27	(0.83, 1.94)			1.19	(0.78, 1.81)
Any Major Discrimination			1.35	(1.07, 1.69)	1.33	(1.06, 1.66)

Note. Models adjusted for age, marital status, household income, education, two or more chronic conditions, any major stressors, and physical activity. All estimates account for the multistage probability sampling design by applying the appropriate weights and strata variables. PR = prevalence ratio, CI = confidence interval. Chronic health conditions include arthritis, cancer, hypertension, diabetes, kidney disease, stroke, asthma, and heart attack. Major stressors include reporting in the past month if respondents had problems with health, money, job, children, marriage, being a crime victim, the police, love life, and their race.

Biodemography Soc Biol. Author manuscript; available in PMC 2018 April 08.