Weight-Based Discrimination and Medication Adherence among Low-Income African Americans with Hypertension: How Much of the Association is Mediated by Self-Efficacy?

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Objectives: Much of the excessive morbidity and mortality from cardiovascular disease among African Americans results from low adherence to anti-hypertensive medications. Therefore, we examined the association between weight-based discrimination and medication adherence.

Methods: We used cross-sectional data from low-income African Americans with hypertension. Ordinal logistic regression estimated the odds of medication non-adherence in relation to weight-based discrimination adjusted for age, sex, education, income, and weight.

Results: Of all participants ($n=780$), the mean (SD) age was 53.7 (9.9) years and the mean (SD) weight was 210.1 (52.8) lbs. Reports of weight-based discrimination were frequent (28.2%). Weight-based discrimination (but not weight itself) was associated with medication non-adherence (OR: 1.94; 95% CI: 1.41–2.67). A substantial portion 38.9% (95% CI: 19.0%–79.0%) of the association between weight-based discrimination and medication non-adherence was mediated by medication self-efficacy.

Conclusion: Self-efficacy is a potential explanatory factor for the association between reported weight-based discrimination and medication non-adherence. Future research should develop and test interventions to prevent weight-based discrimination at the societal, provider, and institutional levels. (*Ethn Dis.* 2014;24[2]:162–168)

Key Words: Health Disparities, Cardiovascular Disease, Obesity, Discrimination, African American

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Introduction

African Americans are three times as likely as Whites to develop cardiovascular disease and twice as likely to die from it.[1] This disparity is partially driven by differences in rates of control for hypertension, a major risk factor for cardiovascular disease. Compared to Whites, African Americans are more likely to have hypertension, less likely to achieve adequate blood pressure control, and more likely to suffer end-organ damage such as myocardial infarction, heart failure, stroke, and end-stage kidney disease.[2] Lack of medication adherence has been cited as an important cause of uncontrolled hypertension,[3] and given the burden of suffering attributable to the downstream consequences of uncontrolled hypertension in the African American population, new approaches are needed to promote medication adherence. The African American Study of Kidney Disease and Hypertension demonstrated that in the clinical trial setting it is possible to achieve high levels of adherence to hypertension treatment with medication and life style changes.[4] However, our incomplete understanding of the root causes of poor medication adherence hampers the ability to develop effective, real-world interventions.

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Although the literature documents many specific barriers to medication adherence, such as economic difficulty, cultural beliefs, and lack of trust in the medical system,[5] the stigma and psychological sequelae of obesity have not received proper attention as a potential root cause of medication non-adherence. Over the past 10 years, the prevalence of obesity in the United States has dramatically increased, and currently more than 50% of African American adults are obese.[6] Parallel to the increasing rates of obesity in the United States, self-reported height or weight discrimination has increased from 7.3% in 1995–1996 to 12.2% in 2004–2006,[7] with the prevalence of weight-based discrimination comparable to reported racial discrimination among women.[8] Weight-based discrimination has been linked with adverse physical and mental health outcomes, such as increased risk of psychiatric disorders,[9] lower self-acceptance,[10] and decreased glycemic control among patients with diabetes.[11] Weight-based discrimination may come from the work place, school systems, the media, and from various interpersonal relationships, including peers and family members.[12,13] Health care professionals are not exempt, with physicians being one of the most frequently reported sources of interpersonal weight-based stigma, second only to family members.[12,14]

Experiences of other types of discrimination, such as discrimination based on race/ethnicity and mental health status, have been associated with lower self-efficacy for medication adherence.[15] Previous studies indicate that

We hypothesized that weight-based discrimination would be associated with medication non-adherence among low-income African Americans treated for hypertension in an inner-city clinic.

self-efficacy is an important prospective predictor of medication adherence.[16,17] Thus, discrimination based on weight from any source may directly erode self-efficacy for medication adherence, leading to a cycle of decreasing medication adherence. We hypothesized that weight-based discrimination would be associated with medication non-adherence among low-income African Americans treated for hypertension in an inner-city clinic. We further hypothesized that the association between weight-based discrimination and medication non-adherence would be partially mediated by medication self-efficacy.

METHODS

Participants and Study Design

The TRUST study[18] was funded by the National Institutes of Health to examine the psychosocial factors associated with hypertension treatment and outcomes for patients receiving care in an inner-city, safety-net setting in Birmingham, Alabama. Eligible participants were ≥19 years, had previously been diagnosed with hypertension, and were established primary care patients at Cooper Green Mercy Hospital. Those who were unable to provide consent or pregnant were excluded. Consenting participants underwent a one-hour computer-assisted interview and agreed to have their medical records abstracted. Our article focuses exclusively on the African American participants, the majority of the study sample. Data were collected in 2007–2008. All study procedures and protocols were approved by the Institutional Review Board at the University of Alabama at Birmingham.

For this analysis, the outcome of interest was self-reported medication adherence, and the exposure was weight-based discrimination. Mediation analysis estimated the percentage of the association between weight-based discrimination and medication adherence that was explained by medication self-efficacy.

Measures

Medication adherence was measured using the Morisky Medication Adherence Scale, which consists of four questions that assess the likelihood that patients take their medications as prescribed. Participants were asked, ''Do you ever forget to take your medications? Are you ever careless in taking your medications? Do you ever miss taking your medications when you are feeling better? Do you ever miss taking your medications because you are feeling sick?''[19] Scores ranged from 0 to 4, according to the number of items endorsed by each participant, with higher scores indicating greater medication non-adherence. Participants endorsing three or four of the items were combined because of small group sizes (79 endorsed 3 questions, and 33 endorsed 4 items).

Weight-based discrimination was assessed with questions adapted from the Experience of Discrimination (EOD) Questionnaire[20] and the Weight Discrimination Scale.[21] Participants reported if they had ever ''experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior in any of the following seven situations because of your weight.'' The situations were: at school, getting a job, at work, getting housing, getting medical care, on the street, and in a public setting. Respondents who disclosed the experience of any discrimination were subsequently asked to rate the intensity of discrimination for each of the above seven social situations as rarely, sometimes, or often. In calculating the overall discrimination score, 0 to 3 points were given for each situation based on whether the respondent reported no discrimination, rarely experiencing discrimination, sometimes experiencing discrimination, or often experiencing discrimination. The individual scores for all seven situations were summed, thus, generating a discrimination score that ranged from 0–21. Preliminary analysis revealed a strong association of the experience of any discrimination with increasing category of medication non-adherence. However, among those experiencing any discrimination, the intensity of discrimination was not related to medication non-adherence (data not shown). Therefore, we classified the main exposure as those who experienced any weight-related discrimination vs those who experienced no discrimination.

Self-efficacy was measured by the Medication Adherence Self-Efficacy Scale, a 26-item scale that is used to assess African American patients' confidence in their ability to take their antihypertensive medications in a variety of situations.''[22] Potential scores range from 0 to 78, with higher scores indicating greater medication self-efficacy.

Participants self-reported their sex, age, annual household income, and education. Weight was abstracted from the medical record.

Statistical Analysis

First, we examined univariate statistics and distributions for all variables. Next, we compared participant characteristics across levels of medication non-adherence and report of weight-based discrimination using the chi-square test for categorical variables and either the ANOVA or *t*-test for continuous variables. Because there were unequal group sizes and unequal group variances, statistical significance for the ANOVA

was determined by the F* test, and the *t*-test assumed unequal variances.[23] A nonparametric trend test was also used to determine the statistical significance of the association between the weight-based discrimination and medication non-adherence.

Two ordinal logistic regression models estimated the cumulative odds ratio describing the association of weight-based discrimination with the four-level medication adherence outcome measure after adjusting for age, sex, income, education, and weight. The proportional odds ratio assumption was tested with the Brant test. The mediator variable (medication self-efficacy) was included only in the second multivariable model.

We performed mediation analysis using a technique developed by Karlson, Holm, and Breen (KHB).[24] This technique decomposes the association of the main independent variable (weight-based discrimination) and the outcome (medication non-adherence) into direct and indirect (mediated) components, while adjusting for multiple covariates (age, sex, income, education, and weight). The indirect component is the difference between the regression coefficients of the main independent variable in a full model versus a reduced model. Both the full and reduced models take the same outcome, include the main independent variable, and include the same set of covariates. The full model also contains the mediator as an additional independent variable. The reduced model replaces the mediator with the residualized mediator, which is derived by regressing the mediator on the main independent variable. We used the KHB approach because it: 1) is not subjected to the re-scaling that prevents comparison of coefficients across non-linear regression equations; 2) is applicable to a broad array of non-linear models; and 3) allows additional covariates to be entered as confounders. The KHB method calculates a mediated percentage, which may be approximately interpreted as the percentage of the main association (between weight-based discrimination and medication non-adherence) that is transmitted though the mediator (medication self-efficacy).[25] Confidence intervals for the mediated percentage were constructed by 1,000 replications of a non-parametric, bias-corrected, and accelerated bootstrap.[26] All analyses were performed using STATA/SE 12.0 (College Station, TX).

Analytic Sample

After excluding 8 participants with missing data for medication non-adherence ($n=8$) or self-efficacy ($n=6$), the final analytic sample consisted of 780 African Americans with hypertension.

RESULTS

Of all participants in the analytic sample ($n=780$), the mean (SD) age was 53.7 (9.9) years, 70.9% were female, 30.3% had an annual household income <$5,000, and the mean (SD) weight was 210.1 (52.8) lbs. Over a quarter (28.2%) of participants reported weight-based discrimination. For those participants reporting discrimination, the mean (SD) discrimination score was 4.4 (3.7) and the range was from 1 to 21. Two-fifths (40.8%) of participants were classified as having best medication adherence, with 28.6%, 16.3%, and 14.4% placed in categories of increasing non-adherence.

Table 1 presents participant characteristics across ordered categories of increasing medication non-adherence. Medication non-adherence was associated with being older, being female, having an annual household income < $5,000, and having lower self-efficacy. Education and weight were not associated with medication adherence. Participants who experienced weight-based discrimination were younger by 4.7 years, weighed more (237.6 vs 199.3 lbs.), and had lower self-efficacy. (Table 2)

Weight-based discrimination was associated with increasing medication non-adherence in a dose-response manner (Figure 1). Reporting any weight-based discrimination was also associated with a greater cumulative odds for medication non-adherence (OR: 1.94; 95% CI: 1.41–2.67) after accounting for age, sex, income, education, and weight (Table 3, Model I). Although additional adjustment for medication self-efficacy reduced the magnitude of this cumulative odds ratio, the effect remained significant (Table 3, Model II). The Brant test did not provide evidence to reject the null hypothesis of the proportionate odds ratio assumption for either regression model. Mediation analysis revealed that 38.9% (95% CI: 19.0%–79.0%) of the association between weight-based discrimination and medication non-adherence was explained by medication self-efficacy.

DISCUSSION

Weight-based discrimination was strongly associated with medication non-adherence among low-income African Americans with hypertension, and nearly two-fifths of this association was attributable to medication self-efficacy. Our findings reveal a possible causal pathway by which weight-based discrimination may exert an influence on medication adherence. African American patients who report weight-based discrimination may feel less empowered to take control of their health and may require additional support to improve medication adherence.

The association between medication adherence and weight-based discrimination was independent of weight itself, but those reporting any weight-based discrimination weighed on average about 40 lbs. more than those not reporting such discrimination. Even those 72% of TRUST participants reporting no weight-based discrimination had a mean weight of 199.3 lbs., indicating that many of them were overweight or obese. Thus, it appears

Table 1. Characteristics of low-income African-Americans with hypertension, by reported medication non-adherence: the TRUST Study, 2007–2008

	Increasing Category of Medication Non-adherence[a]				
	0	1	2	3	*P*[b]
n, (row %)	318 (40.8)	223 (28.6)	127 (16.3)	112 (14.4)	
Mean age (SD), years	54.8 (10.1)	54.3 (10.1)	52.3 (9.5)	50.8 (8.4)	<.001
Sex, column %					
Males	30.8	30.5	32.3	17.9	.043
Females	69.2	69.5	67.7	82.1	
Yearly household income, column %					
≥$5,000	74.2	71.7	60.2	64.1	.020
<$5,000	25.8	28.3	39.8	35.9	
Education, column %					
<High school	16.7	17.1	19.7	17.0	.453
High school	13.2	13.5	14.2	21.4	
>High school	70.1	69.5	66.1	61.6	
Mean weight (SD), lbs	207.4 (52.9)	213.2 (52.8)	208.1 (47.8)	213.7 (51.8)	.519
Self-efficacy for medication adherence[c], mean (SD)	67.3 (7.0)	64.8 (7.8)	60.0 (9.0)	55.4 (10.0)	<.001

[a] Medication adherence was measured by the 4-item Morisky Medication Adherence Scale, with the worst two categories combined because of low cell counts (0=best, 3=worst).
[b] Statistical significance was determined by the chi-square test for categorical variables and by the F* test (adaptation of ANOVA for unequal variances) or t-test for unequal variances for continuous variables.
[c] Self-efficacy was measured by the Medication Adherence Self-Efficacy Scale, range 0–78, with a higher score indicating greater self-efficacy.

likely that perception of weight-based discrimination, rather than actually being overweight or obese is more important in influencing self-efficacy and medication adherence.

Similar to racial discrimination, weight-based discrimination can be experienced on three levels: interpersonal, institutional, and internalized.[27] For example, obese individuals face both intentional and unintentional interpersonal discrimination from health care professionals, such as being ridiculed because of their weight[28] and an avoidance of touch,[29] that can significantly

Table 2. Characteristics of low-income African Americans with hypertension, by reported weight-based discrimination: the TRUST Study, 2007–2008[a]

	Did not Report Weight-based Discrimination	Reported Weight-based Discrimination	*P*[b]
n (row %)	560 (71.8)	220 (28.2)	
Mean (SD) age, years	55.0 (9.4)	50.3 (10.2)	<.001
Sex, column %			
Male	31.5	22.7	.015
Female	68.5	77.3	
Yearly household income, column %			
≥$5,000	70.3	68.7	.675
<$5000	29.7	31.3	
Education, column %			
<High school	19.4	11.8	.034
High school	13.7	16.8	
>High school	66.9	71.4	
Mean weight lbs, (SD)	199.3 (44.5)	237.6 (61.3)	<.001
Self-efficacy for medication adherence[c] (coumn %)	64.3 (8.8)	62.0 (9.6)	.002

[a] Discrimination was measured by the Experience of Discrimination/Weight Discrimination Scales.
[b] Significance was determined by the chi-square test for categorical variables and by the F* test (adaptation of ANOVA for unequal variances) or t-test for unequal variances for continuous variables.
[c] Self-efficacy was measured by the Medication Adherence Self-Efficacy Scale, range 0–78, with a higher score indicating greater self-efficacy.

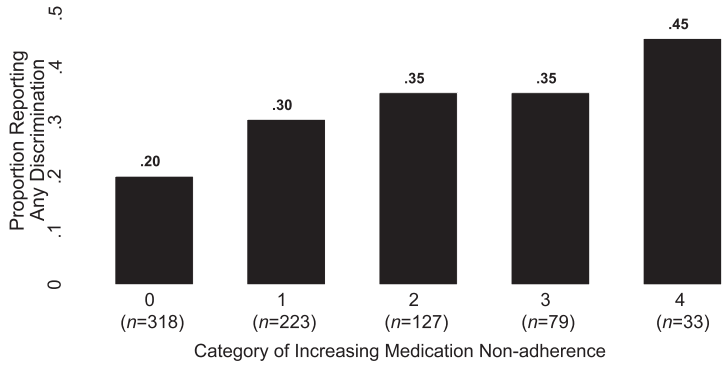

Fig 1. Proportion of African American TRUST participants experiencing any discrimination by medication adherence category. Discrimination was measured by the Experience of Discrimination/Weight Discrimination Scales. Medication adherence was measured by the 4-Item Morisky Medication Adherence Scale, with the worst two categories combined because of low cell counts. Overall Fisher *P*<.001; Nonparametric trend test *P*<.001

diminish the trust a patient has in health care providers. Although previous studies have found no association between weight status and the likelihood of receiving recommended care,[30] obesity bias has been shown to lead to more negative attitudes and distancing behaviors from physicians, such as exhibiting less patience, less overall positivity, less personal desire to help obese patients, and spending less time with obese patients than normal weight patients presenting with the same chief complaint.[31] Physicians also reported a shared belief that obese patients are less likely to be compliant,[32] raising concern about a self-fulfilling prophecy. Motivation for self-care may be decreased when patients sense that health care professionals are not taking a vested interest in their health because of their weight. Not outfitting a clinic with suitable equipment to examine obese patients[33] is a form of institutionalized discrimination that creates an environment that does not welcome overweight individuals and promotes an ideology that being obese is unacceptable or wrong. The interpersonal and environmental milieu may be internalized as obese patients have expressed their sense of powerlessness from weight-based stigma,[34] which may translate into less self-efficacy for medication adherence and general health maintenance. A deeper understanding of personal, institutional, and internalized weight-based discrimination may lead to new approaches for overcoming the barriers to medication adherence among African Americans with hypertension.

African American patients who report weight-based discrimination may feel less empowered to take control of their health and may require additional support to improve medication adherence.

Table 3. Cumulative odds ratios and 95% confidence intervals for increasing category of medication non-adherence among low-income African-Americans with hypertension: the TRUST Study, 2007-2008 (*N*=713)[a]

	Model I		Model II	
	OR	95% CI	OR	95% CI
Age	.98	.97–.99	.98	.96–.99
Female	1.32	.97–1.78	1.24	.91–1.69
Yearly household income <$5,000	1.42	1.05–1.91	1.28	.94–1.74
Education				
<High school	Ref		Ref	
High school	1.18	.73–1.91	1.16	.70–1.90
>High school	.73	.51–1.05	.86	.59–1.26
Weight, lbs	1.00	1.00–1.00	1.00	1.00–1.00
Weight-based discrimination[b]	1.94	1.41–2.67	1.51	1.09–2.11
Self-efficacy for medication adherence[c]			.91	.89–.92

[a] Medication adherence was measured by the 4-item Morisky Medication Adherence Scale, with the worst two categories combined because of low cell counts.

[b] Discrimination was measured by the Experience of Discrimination/Weight Discrimination Scales.

[c] Self-efficacy was measured by the Medication Adherence Self-Efficacy Scale, range 0–78, with a higher score indicating greater self-efficacy.

Our study has limitations that warrant discussion. Medication adherence was self-reported using the Morisky Medication Adherence Scale and thus subject to social desirability reporting bias. As participants would likely over-report medication adherence, this would conservatively bias study findings towards the null. Additionally, the Morisky Medication Adherence Scale is a well-accepted measure for adherence to hypertension medications, and previous studies have validated its ability to identify patients with uncontrolled hypertension.[3,19,35–37] Because height was not measured in this study, we could not calculate body mass index. However, the average weight among those who experienced discrimination was 238 lbs, and an estimated 70% of African American men and 82% of African American women are overweight or obese.[6] Therefore, it is highly likely

that the majority of participants were overweight or obese. Furthermore, weight was associated with weight-based discrimination, supporting the validity of this measure. Other plausible mediators between weight-based discrimination and medication adherence, such as patient health literacy, mental health status, trust in physicians and the health care system, and attitudes and beliefs related to medication adherence, were not measured in this study and thus were not examined in our analyses. Our selected mediator, self-efficacy, may also correlate with other broader self-concepts, empowerment[38] and perceived powerlessness,[39] which were not assessed in our study. Studies examining the relation between perceived racial discrimination, self-efficacy, and self-esteem indicated that African Americans' awareness of educational and occupational racial discrimination was modestly associated with self-efficacy but not associated with self-esteem.[40–42] Further studies are warranted to examine a potential mediation chain[43] of constructs between discrimination and medication adherence, as empowerment or perceived powerless (proximal mediators) can in turn influence self-efficacy (distal mediator) for medication adherence. Finally, we cannot infer causality due to the cross-sectional nature of the data.

CONCLUSION

To our knowledge, ours is the first study to examine the association between weight-based discrimination and medication adherence. Our findings indicate that weight-based discrimination is associated with medication nonadherence among low-income African Americans with hypertension, and almost two-fifths of this association is attributable to lower medication self-efficacy. Results provide novel insight into the complex etiology of medication nonadherence among low-income African American patients with hypertension and can inform future interventions that address and prevent weight-based discrimination at the provider, institutional, and/or societal levels in an effort to improve medication adherence and health among this population. Future studies examining self-efficacy as a mediator between discrimination and a health-related behavior should include measures of self-concept, empowerment, and perceived powerlessness, as well as other potential mediators (ie, trust in physicians, health literacy) in order to examine the relation between these constructs in further detail. Results from this study prompt future investigation of these proximal mediators that can also inform the development of new intervention approaches to improve medication adherence and health outcomes.

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REFERENCES

1. Feldman RH, Fulwood R. The three leading causes of death in African Americans: barriers to reducing excess disparity and to improving health behaviors. *J Health Care Poor Underserved*. 1999;10(1):45–71.
2. Brondolo E, Rieppi R, Kelly KP, Gerin W. Perceived racism and blood pressure: a review of the literature and conceptual and methodological critique. *Ann Behav Med*. 2003; 25(1):55–65.
3. Muntner P, Judd SE, Krousel-Wood M, McClellan WM, Safford MM. Low medication adherence and hypertension control among adults with CKD: data from the REGARDS (Reasons for Geographic and Racial Differences in Stroke) Study. *Am J Kidney Dis*. 2010;56(3):447–457.
4. Lee JY, Greene PG, Douglas M, et al. Appointment attendance, pill counts, and achievement of goal blood pressure in the African American Study of Kidney Disease and Hypertension Pilot Study. *Control Clin Trials*. 1996;17(4 Suppl).
5. Borzecki AM, Oliveria SA, Berlowitz DR. Barriers to hypertension control. *Am Heart J*. 2005;149(5):785–794.
6. Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *JAMA*. 2012;307(5):491–497.
7. Andreyeva T, Puhl RM, Brownell KD. Changes in perceived weight discrimination among Americans, 1995–1996 through 2004–2006. *Obesity (Silver Spring)*. 2008;16(5): 1129–1134.
8. Puhl RM, Andreyeva T, Brownell KD. Perceptions of weight discrimination: prevalence and comparison to race and gender discrimination in America. *Int J Obes (Lond)*. 2008;32(6):992–1000.
9. Hatzenbuehler ML, Keyes KM, Hasin DS. Associations between perceived weight discrimination and the prevalence of psychiatric disorders in the general population. *Obesity (Silver Spring)*. 2009;17(11):2033–2039.
10. Carr D, Friedman MA. Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *J Health Soc Behav*. 2005;46(3):244–259.
11. Tsenkova VK, Carr D, Schoeller DA, Ryff CD. Perceived weight discrimination amplifies the link between central adiposity and nondiabetic glycemic control (HbA1c). *Ann Behav Med*. 2011;41(2):243–251.
12. Puhl RM, Brownell KD. Confronting and coping with weight stigma: an investigation of overweight and obese adults. *Obesity (Silver Spring)*. 2006;14(10):1802–1815.
13. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*. 2009;17(5):941–964.
14. Schwartz MB, Chambliss HO, Brownell KD, Blair SN, Billington C. Weight bias among health professionals specializing in obesity. *Obes Res*. 2003;11(9):1033–1039.
15. Kleim B, Vauth R, Adam G, Stieglitz R-D, Hayward P, Corrigan P. Perceived stigma predicts low self-efficacy and poor coping in schizophrenia. *J Ment Health*. 2008;17(5): 482–491.
16. Schoenthaler A, Ogedegbe G, Allegrante JP. Self-efficacy mediates the relationship between depressive symptoms and medication adherence among hypertensive African Americans. *Health Educ Behav*. 2009;36(1): 127–137.
17. Thom DH, Ribisl KM, Stewart AL, Luke DA. Further validation and reliability testing of the Trust in Physician Scale. The Stanford Trust

Study Physicians. *Med Care*. 1999;37(5): 510–517.
18. Cuffee YL, Hargraves JL, Rosal M, et al. Reported racial discrimination, trust in physicians, and medication adherence among inner-city African Americans with hypertension. *Am J Public Health*. 2013;0:e1–e8.
19. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care*. 1986;24(1):67–74.
20. Krieger N. Racial and gender discrimination: risk factors for high blood pressure? *Soc Sci Med*. 1990;30(12):1273–1281.
21. Ruan WJ, Goldstein RB, Chou SP, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug and Alcohol Dependence*. 2008;92(1–3):27–36.
22. Ogedegbe G, Mancuso CA, Allegrante JP, Charlson ME. Development and evaluation of a medication adherence self-efficacy scale in hypertensive African American patients. *J Clin Epidemiol*. 2003;56(6):520–529.
23. Wilcox R. New Designs in Analysis of Variance. *Ann Rev Psychol*. 1987;38:29–60.
24. Karlson KB, Holm A. Decomposing primary and secondary effects: A new decomposition method. *Research in Social Stratification and Mobility*. 2011;29(2):221–237.
25. Hafeman DM. ''Proportion explained:'' a causal interpretation for standard measures of indirect effect? *Am J Epidemiol*. Dec 1 2009;170(11):1443–1448.
26. Efron B, Tibshirani RJ. *An Introduction to the Bootstrap*. New York: Chapman & Hall; 1993.
27. Jones CP. Levels of racism: a theoretic framework and a gardener's tale. *Am J Public Health*. 2000;90(8):1212–1215.
28. Puhl RM, Moss-Racusin CA, Schwartz MB, Brownell KD. Weight stigmatization and bias reduction: perspectives of overweight and obese adults. *Health Educ Res*. 2008; 23(2):347–358.
29. Bagley CR, Conklin DN, Isherwood RT, Pechiulis DR, Watson LA. Attitudes of nurses toward obesity and obese patients. *Percept Mot Skills*. 1989;68(3 Pt 1):954.
30. Chang VW, Asch DA, Werner RM. Quality of care among obese patients. *JAMA*. 2010; 303(13):1274–1281.
31. Hebl MR, Xu J. Weighing the care: physicians' reactions to the size of a patient. *Int J Obes Relat Metab Disord*. 2001;25(8):1246–1252.
32. Huizinga MM, Bleich SN, Beach MC, Clark JM, Cooper LA. Disparity in physician perception of patients' adherence to medications by obesity status. *Obesity (Silver Spring)*. 2010;18(10):1932–1937.
33. Kaminsky J, Gadaleta D. A study of discrimination within the medical community as viewed by obese patients. *Obes Surg*. 2002;12(1):14–18.
34. Mold F, Forbes A. Patients' and professionals' experiences and perspectives of obesity in health-care settings: a synthesis of current research. *Health Expect*. 2013;16(2):119–142.
35. Bosworth HB, Powers B, Grubber JM, et al. Racial differences in blood pressure control: potential explanatory factors. *J Gen Intern Med*. 2008;23(5):692–698.
36. Shea S, Misra D, Ehrlich MH, Field L, Francis CK. Predisposing factors for severe, uncontrolled hypertension in an inner-city minority population. *N Engl J Med*. 1992;327(11): 776–781.
37. Shea S, Misra D, Ehrlich MH, Field L, Francis CK. Correlates of nonadherence to hypertension treatment in an inner-city minority population. *Am J Public Health*. 1992; 82(12):1607–1612.
38. Rusch N, Lieb K, Bohus M, Corrigan PW. Self-stigma, empowerment, and perceived legitimacy of discrimination among women with mental illness. *Psychiatr Serv*. 2006; 57(3):399–402.
39. Vines AI, Baird DD, McNeilly M, Hertz-Picciotto I, Light KC, Stevens J. Social correlates of the chronic stress of perceived racism among Black women. *Ethn Dis*. 2006;16(1):101–107.
40. Neighbors HW, Jackson JS, Broman C, Thompson E. Racism and the mental health of African Americans: the role of self and system blame. *Ethn Dis*. 1996;6(1–2):167–175.
41. Hughes M, Demo DH. Self-perceptions of Black Americans: Self-esteem and personal efficacy. *American Journal of Sociology*. 1989;95:132–159.
42. Krieger N. Embodying inequality: a review of concepts, measures, and methods for studying health consequences of discrimination. *Int J Health Serv*. 1999;29(2):295–352.
43. Shrout PE, Bolger N. Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychol Methods*. Dec 2002;7(4):422–445.

AUTHOR CONTRIBUTIONS

Design and concept of study: Cuffee, Allison
Acquisition of data: Hullett, Allison
Data analysis and interpretation: Richardson, Waring, Wang, Nobel, Person, Kiefe, Allison
Manuscript draft: Richardson, Waring, Wang, Nobel, Cuffee, Person, Hullett, Kiefe, Allison
Statistical expertise: Richardson, Wang, Nobel, Person, Kiefe, Allison
Acquisition of funding: Allison
Administrative: Hullett
Supervision: Wang, Cuffee, Allison