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Hendley, Yolanda Date

Instructions

Exploring Differences in Weight Perception among Blacks and Whites

By

Yolanda Hendley

Masters of Science

Clinical Research

_____ [Advisor's signature]
Viola Vaccarino MD, PhD
Advisor

_____ [Member's signature]
John Boring PhD
Committee Member

_____ [Member's signature]
John McGowan, MD
Committee Member

_____ [Member's signature]
Thomas Ziegler, MD
Committee Member

Accepted:

_____
Lisa A. Tedesco, Ph.D. Dean of the James T. Laney School of Graduate Studies

_____

Exploring Differences in Weight Perception among Blacks and Whites

By

Yolanda Hendley

Doctor of Medicine, University of Florida, 2005

Advisor: Viola Vaccarino, MD, PhD

An abstract of

A thesis submitted to the Faculty of the James T. Laney School of Graduate Studies of Emory University in partial fulfillment of the requirements for the degree of Master of Science in Clinical Research 2010

Abstract

Exploring Differences in Weight Perception among Blacks and Whites

By Yolanda Hendley

Background: Prevalence of obesity is higher in blacks than whites, especially in women, and is a major contributor to ethnic disparities in CVD. Differences in weight perception may contribute to these differences if blacks are more likely to underestimate their weight. We explored race and gender differences in underestimation of weight, after adjusting for other cardiovascular risk factors.

Methods: The META-Health Study (Morehouse and Emory Team up to eliminate cardiovascular Health disparities) is a 2-stage study including a random-digit-dialing and phone interview of white and black residents of metro Atlanta, aged 30-66, followed by a clinic visit with detailed testing in a subsample. A total of 3391 individuals were interviewed. Of these, 219 white and 240 black men and women underwent detailed testing. Perceived weight status was assessed over the phone with the question: "How do you describe your weight? Would you say underweight, about the right weight, overweight, or obese?" Height, weight, and waist circumference (WC) were measured and body mass index (BMI) was calculated. Logistic regression was used to compare the likelihood of underestimating actual weight category by race, before and after adjusting for socidodemographic, lifestyle factors, and medical history.

Results: Blacks compared with Whites were on average younger, had higher financial stress, and were less likely to be college graduates. Both blacks and whites largely underestimated their weight, but blacks underestimated weight more than whites (64.1% vs. 32.4%). In multivariate analysis, the odds of underestimating BMI category was greater than threefold in blacks compared with whites [OR (95% CI) 3.3 (95% CI, 2.1-5.1)] and was larger for black women than for black men ($p<0.01$ for interaction). When taking into account fat distribution by utilizing WC as a measure of weight, the observed difference in weight underestimation remained.

Conclusion: Our data suggest a pervasive attitude toward acceptance of excess weight among blacks, particularly black women, who have the highest burden of obesity. Educational efforts aimed at decreasing obesity among blacks should be targeted towards ameliorating weight misperception and improving knowledge of obesity-associated risks.

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Table of Contents

INTRODUCTION

Overweight and obesity are established risk factors for cardiovascular disease and a growing problem in the United States [1]. Excess body weight is associated with cardiovascular risk factors, including hypertension, hypercholesterolemia, and diabetes. In 2003-2004, the prevalence of overweight or obesity was 66% among U.S. adults compared to 56% in 1988-1994[2, 3].

Excess body weight is a major contributor to ethnic disparities in cardiovascular disease, since the prevalence of obesity is higher in blacks than whites, especially in women, and a gradient of increasing risk of diabetes, hypertension, and coronary heart disease with increasing body mass index (BMI) has been demonstrated in multiple ethnic groups [4, 5]. In 2003-2004, approximately 76% of black adults were overweight or obese as compared to 64% of white adults. The prevalence of overweight or obesity among black women is even higher, 81%, compared to 58% among white women [2, 6].

Differences in weight perception may contribute to differences in the prevalence of obesity between blacks and whites if blacks, especially black women, are more likely to underestimate their weight. Although racial differences in weight perception have been reported [7-9], few studies have compared such measures with actual weight measurements, including both BMI and measures of body distribution of adiposity, such as waist circumference (WC). Consideration of WC is important because it is a more robust indicator of cardiovascular risk than BMI and differs dramatically by race [10-12]. Accordingly, the objective of our study was to explore race and gender

differences in self-described weight versus measured BMI and WC, after adjusting for other cardiovascular risk factors.

METHODS

Study Population

The META-Health Study (Morehouse and Emory Team up to eliminate cardiovascular Health disparities) is a 2-stage study including a random-digit-dialing and phone interview of white and black residents of metro Atlanta, aged 30-66, followed by a clinic visit with detailed testing in a subsample. A total of 3391 individuals were interviewed by phone. Of these, 219 white and 240 black men and women were examined at the subsequent clinic visit.

We excluded individuals with missing or incomplete data in any study variables (n= 11), individuals who refused to describe their weight perception (n=2), or refused to report their height and weight (n=16). Therefore, 207 white and 223 black men and women were included in the analysis.

Measurements

During the phone interview, weight perception was obtained with a question from the National Health and Nutrition Examination Survey Questionnaire: "How do you describe your weight? Would you say underweight, about the right weight, overweight, or obese?"[13] The respondents answer yielded *self-described body weight*. In addition, self-reported height in feet/inches or centimeters and weight in pounds or kilograms were obtained during the phone interview by asking, "About how tall are you without shoes?" and "About how much do you weigh without shoes?" These values were then used to calculate *BMI from self reported body measures*.

During the clinic visit, height was measured with a Portable Shorr Height Measuring Board. All jewelry and hair dressings were removed and participants were left wearing a

gown and disposable shoes, both provided by the study. Participants were asked to stand straight with their back against the measuring board, heels close together and legs straight. Height was recorded in centimeters to 0.1 cm. Body weight was measured with the S 6600 High Capacity Floor Scale and weight was recorded in kilograms rounding to the nearest 0.1 kg. Utilizing this data we computed body mass index (BMI = weight/height^2, kg/m^2). Using these measurements, we calculated the *actual BMI*. Both actual BMI and BMI from self-reported height and weight were categorized utilizing a standard classification of normal weight ($18.5 \leq$ BMI ≤ 24.9), overweight ($25.0 \leq$ BMI ≤ 29.9), and obesity (BMI ≥ 30 kg/m^2) [14].

We utilized the NHANES III method for obtaining WC [15]. Two persons were present for the measurement of WC in overweight and obese participants. One person held the tape on the opposite side to ensure the level was maintained around the circumference. Measurement was made at minimal respiration to the nearest 0.1 cm. WC was categorized into obese WC (≥ 102 in men and ≥ 88 in women) and non-obese WC utilizing established WC values associated with obesity (BMI ≥ 30 kg/m^2).[16].

Covariate selection was based on previous literature addressing weight perception [8, 17]. In addition, cardiovascular risk factors felt to be relevant were added as covariates; these included history of hypertension, history of hypercholesterolemia, current or previous smoke history. Race and gender were self identified via the telephone survey. Socioeconomic status measures included college education and avoidance of medical care due to cost, as a measure of financial disadvantage, by asking the question "Was there a time in the past 12 months when you needed to see a doctor but could not

because of cost?" [18, 19]. In addition, self reported medical history was obtained, including the presence of cardiovascular risk factors and/or cardiovascular disease.

Statistical Analysis

The difference between perceived versus actual body weight was examined in two ways: Underestimation A) by subtracting actual BMI category from self-described body weight category; and Underestimation B) by subtracting actual BMI category from BMI category based on self-reported body measures. Underestimation of BMI was defined as having a self-described weight category that was lower than the corresponding BMI. Underestimation of obesity was defined as having a self-described weight category of less than obese while having a measured BMI in the obese category. In order to assess the influence of body fat distribution on obesity underestimation by race, we performed a similar analysis in which WC in the obese category was used in place of BMI. The proportion of participants who underestimated their weight was calculated in whites and blacks.

Each covariate, including the main predictor variable, was individually examined for its association with the outcome variable, underestimation of BMI (A). Subsequently, Mantle-Hanzel analysis was performed to assess the effect of each covariate on the race-underestimation association.

Logistic regression was used to compare the likelihood of underestimating actual weight category by race, before and after adjusting for socidodemographic and lifestyle factors (age, socioeconomic status variables, and smoking status) and medical history (hypertension, diabetes mellitus, hypercholesterolemia, previous myocardial infarction,

and previous stroke). Because misperception of weight has been found to be more common in men than women, the analysis was stratified by gender[8]. All analysis were conducted utilizing SAS software, version 9.2, Cary, North Carolina[20].

RESULTS

Characteristics Comparing Total Population

Table 1 depicts sociodemographic and weight description data by clinic visit status. On average individuals with a clinic visit were older than those who did not have a clinic visit (49.9 v 48.5 yrs), p=0.006. In addition, there were a higher percentage of blacks among those who attended clinic visit (52.8%) than among those who did not attend a clinic visit (41.5%). However, there was no difference between the two groups in the proportion of females, those with college education, and those avoiding medical care due to cost. More importantly, self described weight and self-reported BMI categories did not differ significantly between those with and without clinic visit.

Characteristics of Study Population

Table 2 outlines demographics and clinical characteristics by race. Sixty-seven percent of the participants were women. Blacks compared with whites were on average younger, less likely to be college educated, and more likely to avoid seeing a doctor when needed due to cost. In addition, blacks had a larger WC (99.9 vs 96.5cm), and more often reported a history of hypertension (44.8 vs 31.4%), and diabetes (12.6 vs. 4.4) compared with whites.

Tables 2 and 3 represent baseline demographics and clinical characteristics for women and men by race. These tables illustrate that most of the observed differences previously noted between blacks and whites were mostly seen among women rather than men.

Actual and Perceived Body Weight

The average measured BMI was higher in blacks (31.4±7.6) than whites (28.0±6.6), p <0.01 (Table 1), but this difference was driven by women. Among women, measured

BMI was 31.8±7.8 for black women and 27.2±6.7 for white women, ($p < 0.01$). Excess body weight (overweight or obesity) was noted in 80.5% of black women and 54.0% of white women; obesity was twice as common in black women (53.2%) than in white women (24.4%) ($p < 0.01$). BMI calculated from self-reported height and weight was also higher in black women (30.0±6.8) than white women (26.0±5.9) ($p < 0.01$). However, when asked to describe their weight, 64.3% of black women described themselves as overweight compared to 49.6% of white women, $p<0.01$.

In contrast to the women, among men there were no differences in either measured or self-reported BMI by race. Measured BMI was 30.5±7.1 for black men and 29.6±6.0 for white men ($p=0.52$). Excess body weight was noted in 83.8% of black men and 80.6% of white men; obesity in 46.4% and 38.9%, respectively, $p=0.65$. Self reported BMI was 29.4±6.1 for black men and 28.4±5.1 for white men, $p=0.32$. Self-described weight was also similar: 49.3% of black men described their weight as excessive compared to 58.3% of white men, $p=0.56$.

Underestimation of Weight

When weight underestimation was defined as the difference between actual BMI and self-described body weight category, a large proportion of participants (48.8%) underestimated their weight. Blacks were twice more likely to underestimate their weight than whites: 64.1% vs. 32.4%. Figures 1 and 2 demonstrate that despite being more often obese, blacks were less likely to describe themselves as obese compared with whites (4.9% vs 8.2%). Again, these differences were mostly driven by the women. Figure 3 illustrates that a total of 62.3% of black women compared to 21.5% of white women

underestimated their weight ($p<0.01$). Among men, 68.1% of black men compared to 52.8% of white men underestimated their weight ($p=0.06$). When looking specifically at obesity, 48.7% of black women compared to 16.3% of white women underestimated obesity ($p<0.01$); while 40.6% of black men compared to 31.9% of white en underestimated obesity utilizing BMI ($p=0.29$) (Figure 4).

Table 5 illustrates the association of each dependent variable with underestimation of weight (underestimation A). Variables found to be significant in this bivariate analysis were race, gender, attending college, hypertension, diabetes, and history of CVD. Table 6 shows the changes in the association between the variable of interest, race, and underestimation of weight according to covariates. In this analysis, the race-underestimation A association was dependent on the level of gender ($p<0.01$); there was no interaction with any of the other study factors.

When weight underestimation was defined as the difference between actual BMI and BMI calculated from self-reported body measures, no differences in underestimation were found by race (Figure 1); this was true for both men and women.

In multivariate analysis adjusting for socidodemographic factors and comorbidities, overall blacks had 3.3 (95% CI, 2.1-5.1) greater odds of underestimating their weight than their white counterparts, utilizing measured BMI versus self-described weight category (Table 7). Among women, after adjusting for the same factors, black women had a 4.9 (95% CI 2.7-8.7) greater odds of underestimating weight than white women. The estimate among men was 1.8 (95% CI 0.8-4.1), $p<0.01$ for the interaction between gender and race.

When specifically looking at obesity, the results were similar. In multivariate analysis adjusting for socidodemographic and comorbidities, overall blacks had a 2.7 (95% CI, 1.7-4.3) greater odd of underestimating obesity than their white counterparts. Among women, after adjusting for the same factors, black women had a 3.9 (95% CI 2.1-7.1) greater odds of underestimating obesity than white women. The estimate among men was 1.6 (95% CI 0.7-3.5), $p<0.01$ for the interaction between gender and race.

Role of Fat Distribution

Next, in order to assess if fat distribution affected the association between race and underestimation of weight, we utilized WC in place of BMI for the definition of obesity. This analysis yielded similar results as for BMI. Overall, 51.6% of participants underestimated obesity utilizing in this analysis. Among women, 66.2% of black women underestimated obesity compared to 48.2 % of white women ($p<0.01$); while among men, 36.2% of black men underestimated obesity compared to 41.7% of white men ($p=0.51$) (Figure 4). In multivariate analysis adjusting for socidodemographic factors and comorbidities, black women had a 1.7 (95% CI 1.0-2.9) greater odds of underestimating obesity than white women, when the WC definition was used. The estimate among men was 0.7 (95% CI 0.3-1.6), $p=0.02$ for the interaction between gender and race.

DISCUSSION

We found a notable difference in weight perception between blacks and whites, particularly among black women. Despite being more often obese, black women were less likely to describe themselves as obese compared with white women. When taking into account fat distribution by utilizing WC as a measure of weight, the observed difference in obesity underestimation between black and white women persisted. Differences in weight underestimation were not due to under-estimating weight measurement, since there were no differences in weight underestimation when BMI calculated from self-reported height and weight was considered. Therefore, differences appear to be due to differences in weight perception, presumably secondary to cultural differences on interpretation of what constitutes excess body weight and body weight satisfaction, thereby making an individual's culture a potential risk factor for obesity.

Racial differences in body weight perception have been rarely examined. Paeratakul et al conducted a study on self perception of weight and found that misperception of weight was higher among blacks compared to same weight in whites. As we did, they also found weight misperception to be higher among men than women[8] .This study however only utilized self-reported measurements of body weight and height. In a study conducted by Dorsey et al based on the National Health and Nutrition Examination Survey, minorities and persons with lower educational levels were more likely to have a weight misperception[17]. This study, however, did not take into account the presence or absence of cardiovascular risk factors other than diabetes, which may differ by race and may affect weight perception. In addition, it did not take into account body fat

distribution, which may influence weight perception and is associated with cardiovascular risk independent of BMI [21, 22].

The continued increase prevalence of overweight and obesity, a largely preventable condition, in the United States is detrimental to the health care system as it is associated with substantial morbidity and mortality and health care costs. The prevalence of diabetes mellitus is 2% among normal weight, 5% among overweight, and 10-12% among obese individuals; the prevalence of hypertension is also dramatically higher among overweight, and obese people than normal weight people[5]. It is known that higher rates of overweight and obesity exists in blacks compared to whites. An accurate perception of weight may be a significant factor in initiating a change in lifestyle. Our data suggest that cultural differences in the perception of body weight could play an important role in the larger prevalence of overweight and obesity among blacks, particularly among black women. That there are cultural differences in weight perception related to race/ethnicity is suggested by a study of differences in self-perceived versus ideal body size in whites and blacks. Although blacks had higher prevalence of obesity compared to whites, researchers found that blacks had a smaller discrepancy between perceived and ideal body size, suggesting that blacks were more comfortable with their weight. In addition, black participants tended to select larger ideal figures than white participants [23].

One limitation of our study is that utilization of BMI does not account for percentage of body fat and therefore can lead to misclassification. However, we also examined WC, a measure of fat distribution, and found overall similar results. Another limitation is that the sample was drawn from one metropolitan area, Atlanta, where the

prevalence of overweight and obesity is higher than other geographic locations. However, populations with high burden of obesity are those that potentially could benefit most from intervention. In addition, due to the high representation of blacks and their distribution across all socioeconomic classes, Atlanta is an ideal setting for the study of racial differences in risk factors and behaviors. The clinic visit subsample was in part but not completely random. However, there were only minor differences between those who did and did not present for a clinic visit, with similarities in weight description and college education.

In conclusion, our data suggest a pervasive attitude toward acceptance of excess weight among blacks, particularly black women, who have the highest burden of obesity. Our results indicate that educational efforts aimed at decreasing obesity among blacks should be targeted towards ameliorating weight misperception and improving knowledge of obesity-associated risks. Future studies should test the effectiveness of such strategies toward curbing the obesity epidemic among blacks, especially women.

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Table 1. Comaprison of Demographics and Weight Descriptions by Clinic Visit Status.

	Clinic Visit (n=429)	***No Clinic Visit (n=2962)***	***P value***
Age	49.9±9.5	48.5±9.8	0.006
Black race	227 (52.8)	1228 (41.5)	<0.001
Female gender	286 (66.5)	1966 (66.4)	0.96
College	233 (54.2)	1513 (51.2)	0.24
Avoid medical care due to cost	74 (17.2)	422 (14.3)	0.19
BMI categories(based on self report)			0.66
Normal	138 (32.8)	916 (33.7)	
Over Weight	139 (33.0)	933 (34.3)	
Obese	144 (34.2)	869 (32.0)	
Self-described BMI categories			0.26
Normal	179 (41.6)	1280 (43.4)	
Over Weight	214 (49.8)	1408 (47.7)	
Obese	28 (6.5)	158 (5.4)	

Table 2. Comparison of Demographics and Clinical Characteristics between Blacks and Whites

	Total Sample (n=430)	Blacks (n=223)	Whites (n=207)	p value
Age	50.4±9.4	49.1±9.3	51.7±9.5	<0.01
BMI (calculated from measured HT & WT)	29.8±7.3	31.4±7.6	28.0±6.6	<0.001
BMI (calculated from Self-reported HT &WT)	28.4±6.4	29.8±6.6	26.9±5.7	<0.001
Waist Circumference	98.3±17.2	99.9±17.6	96.5±16.7	0.03
Female Gender	289 (67.2)	154 (69.1)	135 (65.2)	0.40
College education	233 (54.2)	86 (38.6)	147 (71.0)	<0.001
Avoided medical care due to cost	74 (17.2)	49 (22.0)	25 (12.1)	0.01
BMI categories (based on Measured HT &WT)				<0.001
Normal	117 (27.2)	41 (18.4)	76 (36.7)	
Over Weight	138 (32.1)	68 (30.5)	70 (33.8)	
Obese	175 (40.7)	114 (51.1)	61 (29.5)	
BMI categories (based on self-reported HT &WT)				<0.001
Normal	146 (34.0)	60 (26.9)	86 (41.5)	
Overweight	142 (33.0)	66 (29.6)	76 (36.7)	
Obese	142 (33.0)	97 (43.5)	45 (21.7)	
Self-described BMI categories				0.07
Normal	188 (43.7)	90 (40.4)	98 (47.3)	
Overweight	214 (49.8)	122 (54.7)	92 (44.4)	
Obese	28 (6.5)	11 (4.9)	17 (8.2)	
Underestimate A (measured BMI vs perceived body weight)	210 (48.8)	143 (64.1)	67 (32.4)	<0.001
Underestimate B (measured BMI vs BMI from self-reported HT &WT)	67 (15.6)	37 (16.6)	30 (14.5)	0.54
Underestimate BMI obesity (BMI>=30 vs perceived obesity)	148 (34.2)	103 (46.2)	45 (21.7)	<0.001
Underestimate WC obesity (WC ≥ 102 men; ≥ 88 women vs perceived obesity)	222(51.6)	127(57.0)	95(45.9)	0.02
Smoking				0.03
Non-smoker	249 (57.9)	138 (57.8)	120 (58.0)	
Current Smoker	70 (16.3)	45 (20.2)	25 (12.1)	
Previous Smoker	111 (25.8)	49 (22.0)	62 (30.0)	
History of Hypertension	165 (38.4)	100 (44.8)	65 (31.4)	<0.01
History of Diabetes	37 (8.6)	28 (12.6)	9 (4.4)	<0.01
History of High blood cholesterol	163 (37.9)	85 (38.1)	78 (37.7)	0.93
History of CVD	30 (7.0)	20(9.0)	10 (4.8)	0.09

BMI=body mass index; HT=height; WT= weight; WC= waist circumference; CVD= cardiovascular disease

Table 3 Baseline Demographics and Clinical Characteristics Among Men

	Men (n=141)	Black (n=69)	White (n=72)	p value
Age	50.6±9.6	48.3±9.5	52.8±9.2	<0.01
BMI (calculated from measured HT & WT)	30.0±6.6	30.5±7.1	29.6±6.0	0.52
BMI (calculated from Self-reported HT &WT)	28.9±5.6	29.4±6.1	28.4±5.1	0.32
Waist Circumference	103.7±16.7	102.6±17.9	104.8±15.4	0.23
College	76 (53.9)	24 (34.8)	52 (72.2)	<0.001
Avoided medical care due to cost	14 (9.9)	9 (13.0)	5 (6.9)	0.23
BMI categories (based on Measured HT &WT)				0.65
Normal	25 (17.7)	11 (15.9)	14 (19.4)	
Over Weight	56 (39.7)	26 (37.7)	30 (41.7)	
Obese	60 (42.6)	32 (46.4)	28 (38.9)	
BMI categories (based on self-reported HT &WT)				0.43
Normal	35 (24.8)	15 (21.7)	20 (27.8)	
Over Weight	58 (41.1)	27 (39.1)	31 (43.1)	
Obese	48 (34.0)	27 (39.1)	21 (29.2)	
Self-described BMI categories				0.56
Normal	65 (46.1)	35 (50.7)	30 (41.7)	
Over Weight	67 (47.5)	30 (43.5)	37 (51.4)	
Obese	9 (6.4)	4 (5.8)	5 (6.9)	
Underestimate A (measured BMI vs perceived body weight)	85 (60.3)	47 (68.1)	38 (52.8)	0.06
Underestimate B (measured BMI vs BMI from self-reported HT &WT)	28 (19.9)	13 (18.8)	15 (20.8)	0.77
Underestimate BMI obesity (BMI>=30 vs perceived obesity)	51 (36.2)	28 (40.6)	23 (32.0)	0.29
Underestimate WC obesity (WC $\geq$102 men ; $\geq$ 88 women vs perceived obesity)	55 (39.1)	25 (36.2)	30 (41.7)	0.51
Smoke				0.61
Non-smoker	76 (53.9)	36 (52.2)	40 (55.6)	
Current Smoker	26 (18.4)	15 (21.7)	11 (15.3)	
Previous Smoker	39 (27.7)	18 (26.1)	21 (29.2)	
History of Hypertension	63 (44.7)	35 (50.7)	28 (38.9)	0.16
History of Diabetes	12 (8.5)	8 (11.6)	4 (5.6)	0.20
History of High blood cholesterol	51 (36.2)	24 (34.8)	27 (37.5)	0.74
History of CVD	14(9.9)	7(10.1)	7 (9.7)	0.93

Table 4. Baseline Demographics and Clinical Characteristics Among Women

	Women (n=289)	Black (n=154)	White (n=135)	p value
age	50.3±9.4	49.5±9.1	51.1±9.6	0.12
BMI (calculated from measured HT & WT)	29.7±7.6	31.8±7.8	27.2±6.7	<0.001
BMI (calculated from Self-reported HT &WT)	28.1±6.7	30.0±6.8	26.0±5.9	<0.001
Waist Circumference	95.6±16.9	98.8±17.4	92.0±15.6	<0.001
College	157 (54.3)	62 (40.3)	95 (70.4)	<0.001
Avoided medical care due to cost	60 (20.8)	40 (26.0)	20 (14.8)	0.02
BMI categories (based on Measured HT &WT)				<0.001
Normal	92 (31.8)	30 (19.5)	62 (45.9)	
Over Weight	82 (28.4)	42 (27.3)	40 (29.6)	
Obese	115 (39.8)	82 (53.2)	33 (24.4)	
BMI categories (based on self-reported HT &WT)				<0.001
Normal	111 (38.4)	45 (29.2)	66 (48.9)	
Over Weight	84 (29.1)	39 (25.3)	45 (33.3)	
Obese	94 (32.5)	70 (45.5)	24 (17.8)	
Self-described BMI categories				<0.01
Normal	123 (42.6)	55 (35.7)	68 (50.4)	
Over Weight	147 (50.9)	92 (59.7)	55 (40.7)	
Obese	19 (6.6)	7 (4.6)	12 (8.9)	
Underestimate A (measured BMI vs perceived body weight)	125 (43.3)	96 (62.3)	29 (21.5)	<0.001
Underestimate B (measured BMI vs BMI from self-reported HT &WT)	39 (13.5)	24 (15.6)	15 (11.1)	0.27
Underestimate BMI obesity (BMI>=30 vs perceived obesity)	97 (33.6)	75 (48.7)	22 (16.3)	<0.001
Underestimate WC obesity (WC ≥ 102 men ; ≥ 88 women vs perceived obesity)	167(57.8)	102 (66.2)	65 (48.2)	<0.01
Smoke				0.03
Non-smoker	173 (59.9)	93 (60.4)	80 (59.3)	
Current Smoker	44 (15.2)	30 (19.5)	14 (10.4)	
Previous Smoker	72 (24.9)	31 (20.1)	41 (30.4)	
History of Hypertension	102 (35.3)	65 (42.2)	37 (27.4)	0.01
History of Diabetes	25 (8.7)	20 (13.0)	5 (3.7)	0.01
History of High blood cholesterol	112 (38.8)	61 (39.6)	51 (37.8)	0.75
History of CVD	16 (5.5)	13 (8.4)	3 (2.2)	0.02

Table 5. Unadjusted Association between Covariates and Underestimation of Weight.*

Variable	OR (95% CI)
Black	3.74 (2.50-5.57)
Aged	0.91(0.62-1.33)
Female	0.50 (0.33-0.76)
College	0.45 (0.31-0.67)
Avoided medical care due to cost	0.99 (0.60-1.64)
Current Smoker	0.99 (0.59-1.65)
Former Smoker	0.77 (0.50-1.20)
History of Hypertension	2.78 (1.86-4.16)
History of Diabetes	2.34 (1.14-4.79)
History of Hypercholesterolemia	1.14 (0.77-1.69)
History of CVD	2.60(1.16-5.83)

*Black= Race (1=Black 0=White)
Aged= age <=51 and age >51
Female= Gender (1=Female 0=Male)
College= graduated college
History of CVD= History of myocardial infarction or stroke
Underestimation of weight= BMI difference between measured and self described weight is greater than or equal to one.

Table 6. Relationship between Race Underestimation of Weight according to other Covariates

Variable	Crude OR for Race	Stratum specific ORs		Adjusted OR (95%CI)	P-value* for Breslow –Day test for interaction
		OR1	OR0		
Aged (1= (<=51);0= (>51))	3.74	2.72	5.30	3.75(2.51-5.61)	0.1081
Gender (1=female;0=male)	3.74	6.05	1.91	--	0.0086
College (1=yes;0=no)	3.74	3.10	3.52	3.27(2.16-4.97)	0.7690
Avoided medical care due to cost (1=yes;0=no)	3.74	5.00	3.67	3.84 (2.56-5.77)	0.6048
Current Smoker (1=yes;0=no)	3.74	2.22	4.20	3.79 (2.53-5.66)	0.2535
Former Smoker (1=yes;0=no)	3.74	4.21	3.54	3.70 (2.48-5.52)	0.7126
History of Hypertension (1=yes;0=no)	3.74	2.94	3.91	3.50 (2.33-5.27)	0.5055
History of Diabetes (1=yes;0=no)	3.74	7.33	3.42	3.58 (2.39-5.35)	0.3777
History of Hypercholesterolemia (1=yes;0=no)	3.74	3.65	3.80	3.74 (2.51-5.58)	0.9245
History of CVD (1=yes;0=no)	3.74	--	--	3.66 (2.45-5.47)	0.5735

Table 7. Adjusted association between Covariates and Underestimation of Weight

Variable	OR (95% CI)
Black	3.25 (2.06-5.12)
Aged	0.99 (0.96-1.01)
Female	0.46 (0.29-0.73)
College	0.62 (0.39-0.98)
Avoided medical care due to cost	0.85 (0.48-1.51)
Current Smoker	0.50 (0.27-0.94)
Former Smoker	0.75 (0.44-1.26)
History of Hypertension	2.55 (1.58-4.11)
History of Diabetes	1.16 (0.50-2.68)
History of Hypercholesterolemia	0.86 (0.53-1.37)
History of CVD	1.94 (0.77-4.88)

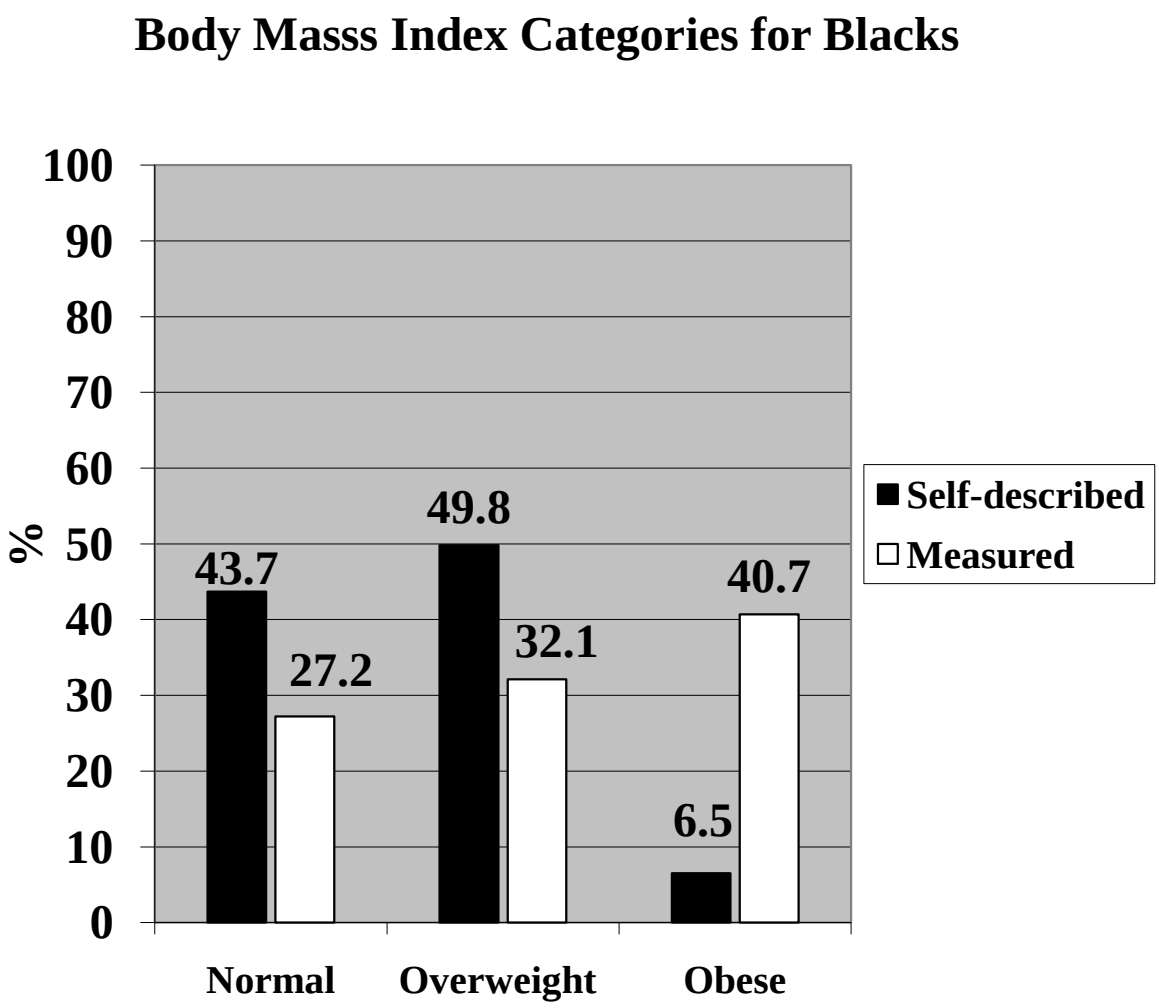

Figure 1. Percentage of blacks categorized by BMI for self described body weight and measured height and weight.

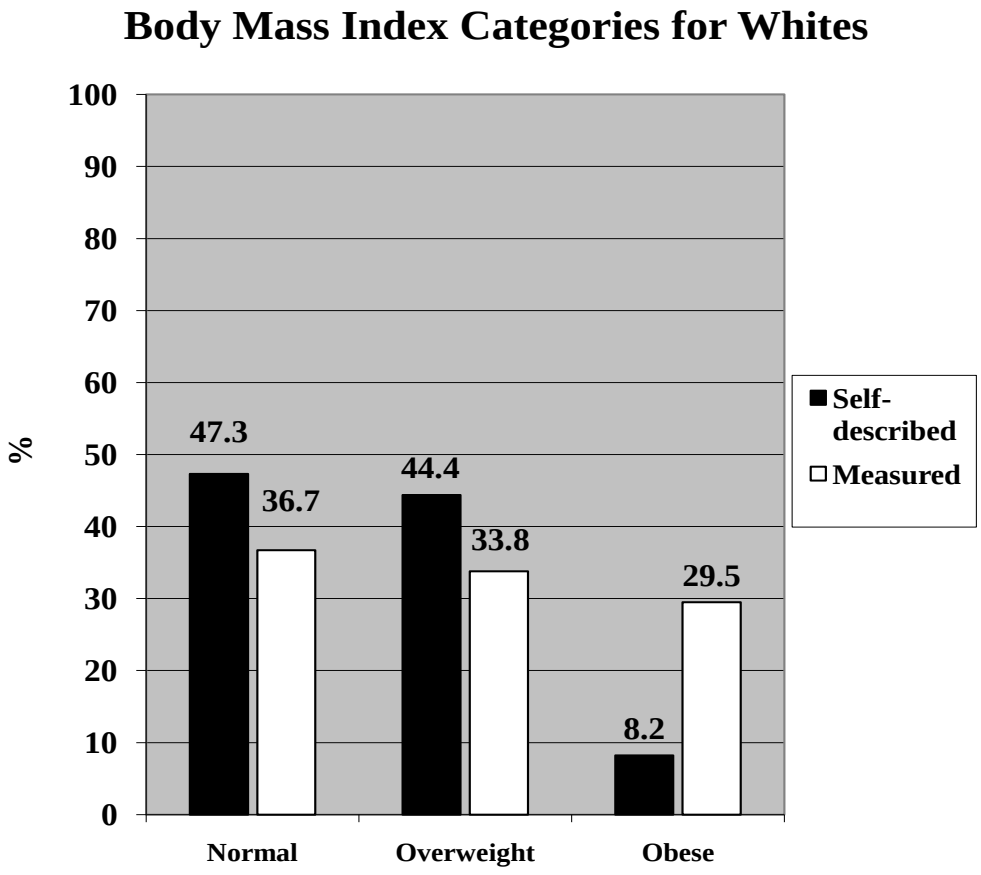

Figure 2. Percentage of whites categorized by BMI for self described body weight and measured height and weight.

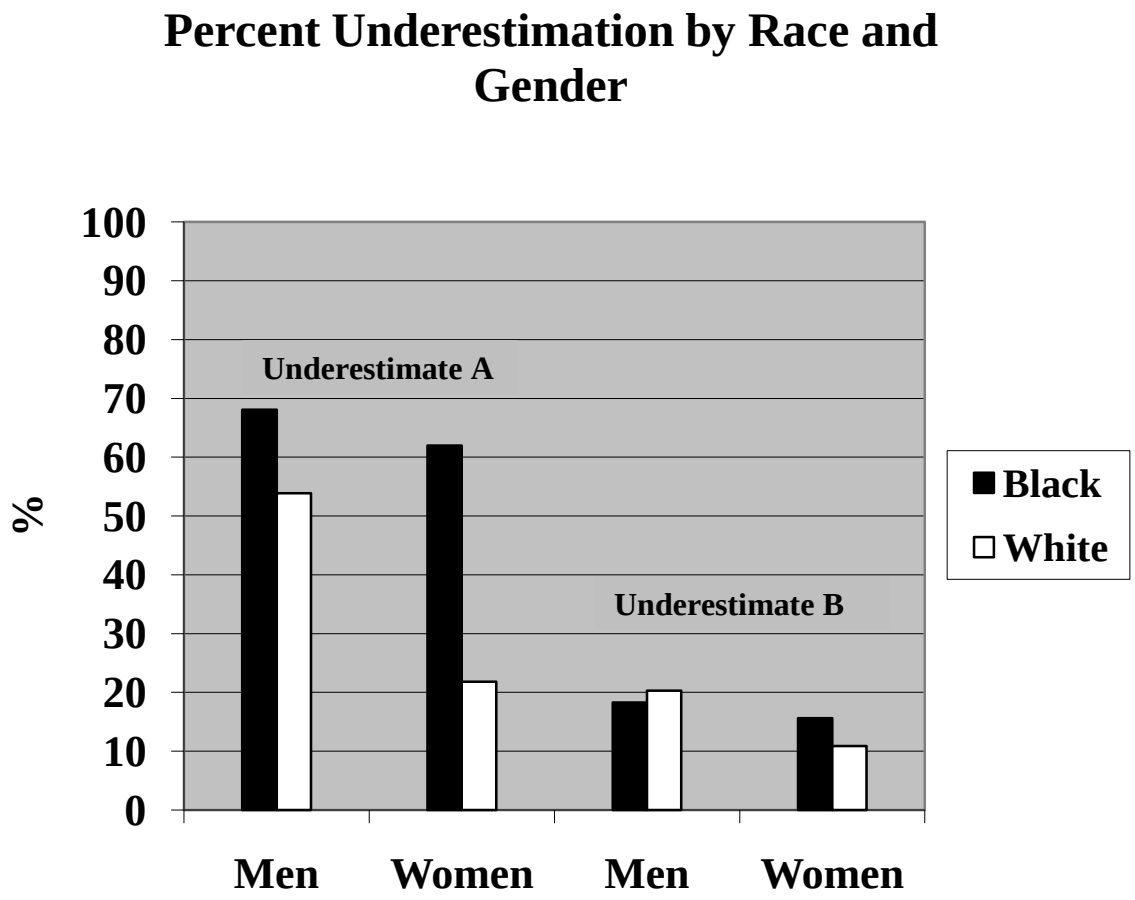

Figure 3. Percentage of blacks and whites who underestimated weight. Underestimate A compares self-described BMI with measured BMI. Underestimate B compares BMI from self-reported HT and WT to measured BMI.

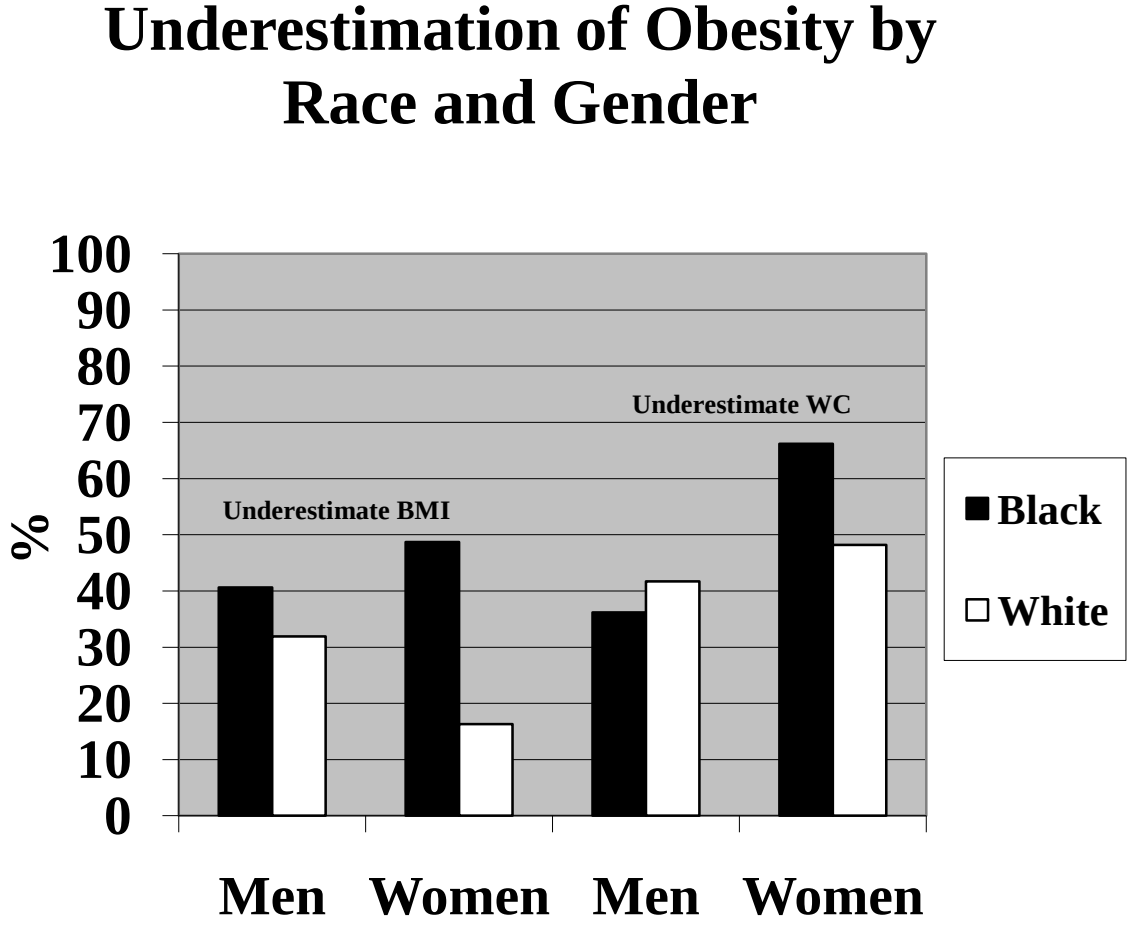

Figure 4. Percentage of participants underestimating obesity stratified by race and gender. Underestimate BMI uses self-described BMI versus measured BMI category. Underestimate WC uses self-described WC versus measured WC category.