Gender Differences in Body Image and Health Perceptions among Graduating Seniors from a Historically Black College

Susan M. Gross, PhD, MPH, RD; Tiffany L. Gary, PhD; Dorothy C. Browne, DrPH; and Thomas A. LaVeist, PhD

Baltimore, Maryland

Financial support: This work was supported by a grant from the National Institutes of Health NCMHD (1P60MD000214-01, 5P60MD00217-02, U24DA12390-04).

This study's purpose was to identify gender differences in body size awareness and perceived impact of weight on social interactions and risk for disease among young African-American adults. A cross-sectional survey of 318 African-American graduating seniors from a historically black college or university (HBCU) was conducted. Data were collected on anthropometrics, body image, ideal weight, perceived risk for disease due to weight, and impact of weight on social interactions. Only 39% of males who were overweight perceived themselves as overweight compared with 68% of overweight females. Eighty percent of females and 63% of males expressed some body size dissatisfaction. Fewer obese males (38%) perceived a risk for disease due to their weight compared with obese females (64%), $p \leq 0.01$. Males perceived greater impact than females of their weight on social interactions, with extremely obese males perceiving the greatest impact. Perceived risk for disease due to weight was related to body mass index, family weight history, body awareness and income, but not body size satisfaction. Findings suggest gender differences in the self-perception of body size, accuracy of body size perception, and understanding of acceptable weight ranges. Awareness of acceptable weight ranges and consequences of overweight needs to be raised.

Key words: obesity ■ self-perception of body size ■ African Americans ■ young adults ■ perceived risk of disease

© 2005. From Morgan-Hopkins Center for Health Disparities Solutions, Program in Public Health, Morgan State University (Gross, Browne) and the Department of Epidemiology (Gary) and the Department of Health Policy and Management (LaVeist) Johns Hopkins Bloomberg School of Public Health, Baltimore, MD. Send correspondence and reprint requests for *J Natl Med Assoc.* 2005;97:1608–1619 to: Susan M. Gross, PhD, MPH, RD, Morgan-Hopkins Center for Health Disparities Solutions, Program in Public Health, Morgan State University; phone: (443) 885-4030; fax: (443) 885-8262; e-mail: sgrossphd@yahoo.com

The prevalence of overweight and obesity is at epidemic levels in the United States, and this epidemic is particularly high among African Americans.[1] The 1995 National College Health Risk Behavior Survey (NCHRBS) suggests that the prevalence of at least overweight is 48.7% in African-American students compared to 34.6% in white students.[2] However, it has been noted that among young African-American adults, body weight is often taken too lightly and body awareness as it relates to overweight and obesity status is often lacking.[3] Regardless of ethnicity or race, young adult males are more likely to be unaware of their body weight compared with women.[4] In a national study, 27.5% of women and 29.8% of men misclassified their own weight status by National Institutes of Health (NIH) standards. Of particular note, 32.8% of overweight men thought they were "about the right weight" or "underweight".[5] For many people, particularly men, the meanings of overweight and ideal weight differ from the health recommendations.[6,7]

Body awareness differs by gender and has been associated with health-promotion activities.[8,9] In a national study of adolescents ages 12–16, weight management behaviors were associated with whether adolescents perceived themselves to be overweight independent of whether they were actually overweight.[8] However, a study of adolescent males and females found that obese males perceived themselves as less overweight and were less likely to engage in weight management behaviors than obese girls.[10]

Body image satisfaction has been associated with health-promotion activities. Interestingly, a study of college students found that those more critical of their body shape may be more likely to avoid situations in which their physique is under scrutiny of others, such as exercise classes or working out at the gym.[11] Cultural ideals have been shown to shape individuals' perceptions of body size and the extent to which one utilizes weight management behaviors to manage body size.[12]

Studies investigating gender differences in body image and effect consistently show that men and women differ in perception of and dissatisfaction with their bodies. In particular, men are less critical of their bodies, perceiving both their size and shape as normal. For both genders, satisfaction with body weight and shape decreased as BMI increased.[13] Among African Americans, it has been noted that, culturally, a larger body size is regarded as healthy; attractive; and represents stamina, strength and presence among this population.[14] Overweight African-American women are more likely to be satisfied with their body size than overweight women of other ethnic groups.[15] However, African-American women are more likely to be dissatisfied with their body size than African-American men.[16] It has been suggested that obese African-American women may know that they are obese and accept their weight status but may still be dissatisfied with it.[17] Experiences related to being obese or overweight as a child[18,19] and having overweight parents[20-22] have also been associated with greater body dissatisfaction.

The theory of reasoned action suggests that individuals who feel vulnerable to a threat such as disease are more likely to engage in behaviors to prevent the threat of disease.[23] Overweight and obesity are risk factors for cardiovascular disease, diabetes and some forms of cancer. Research would suggest feelings of invulnerability could extend into adulthood and directly affect perception of disease susceptibility.[24] Most young adults may not feel vulnerable to these chronic diseases since they have little personal experience with these illnesses; therefore, they may not perceive them as imminent.[25] Moreover, college men and women have been reported to have an optimistic bias when it comes to perceived risk of chronic illnesses, such as heart disease,[26] colon cancer[25] and breast cancer.[27]

Very few research studies have tried to assess college students' perceived risk for disease, especially how their weight influences this risk. Perceived risk for disease maybe an impetus for improving health behaviors and a starting point for health-promotion activities.

The self-perception of weight appropriateness is an important component of eating and weight loss behaviors. In particular, a considerable proportion of overweight individuals may be at risk for obesity if they continue to perceive themselves as having normal weight.[28] Among female college students, concerns about weight have been associated with lower self-esteem and fewer social interactions, such as dating.[29] Among overweight and obese young adult females, concerns about their weight have been associated with relationship dissatisfaction,[30] stigmatizing social situations[31,32] and aspirations to be childless.[30] Very little is known about how body image satisfaction relates to perception of risk for health conditions and perceived impact on social interactions among African-American college students.

African Americans have a higher prevalence of obesity- and weight-related diseases, such as diabetes, heart disease and hypertension, than the general U.S. population.[1] In order to develop and promote effective weight management strategies, it is important to identify factors related to body size perception and body satisfaction during young adulthood. It is also important to identify how African-American young adults perceive the impact of their weight on health and social interactions. This study's purpose was to identify gender differences in body size awareness and perceived impact of weight on social interactions and risk for disease among young African-American adults.

METHODS

Study Setting and Participants

We conducted a cross-sectional survey among 406 young adults (primarily African-American) graduating in the spring of 2003 from a historically black university located in the mid-Atlantic region. The entire graduating undergraduate class was eligible to participate regardless of age, sex or ethnicity. Overall, 855 students were scheduled to graduate: 36% male, 63% female. Graduates were on average 26 years of age, and 89% identified as being African-American or black.

The university is located in an urban area and attracts students from all 50 states and numerous foreign countries. Over 6,000 students are enrolled in programs from the baccalaureate through the doctorate level. It is one of the leading national institutions in the number of applications received from African-American, high-school graduates. Although a historically black institution, the university always has served students of all racial and ethnic backgrounds. The racial composition in the fall of 2002 was as follows: African Americans (89%); whites (2%); and Asians, Hispanics and Indians (~3–4%). Six percent were international students.

Following the receipt of institutional review board approval, a recruitment letter was sent to the students' permanent home addresses. This letter provided information about the study and invited them to participate. Subsequently, a self-administered paper-and-pencil survey was conducted as seniors waited in line to receive their graduation regalia. Stations for data collection were set up in the student union for two days. The survey took approximately 30–45 minutes to complete. Written informed consent was obtained from each participant and investigators were present to answer questions. Upon com-

pletion of the questionnaire, each participant received a $10 incentive.

In this analysis, we excluded 47 individuals who had incomplete data on ideal weight, 10 individuals who had incomplete data on healthy weight, 18 individuals who had incomplete data on the perceived impact of weight on social interactions scale, six individuals who had incomplete data on height and/or weight, five individuals who wanted to reduce their weight by 100 lbs or more, one who had incomplete data on marital status, three who had incomplete data on self-perception of weight status, two individuals who had incomplete data on sex and six due to current pregnancy. This yielded a final study sample of 318 individuals: 104 (33%) males and 214 (67%) females. Those excluded were not different on any study variables compared with those who remained in the study.

MEASURES

Sociodemographic Variables

Respondents reported on personal demographic information, including age, race, U.S. citizenship, marital status, number of children, income, health status and health history (ever diagnosed by a physician for any of the following conditions: high blood pressure, diabetes, cancer, heart disease and breathing problems).

Weight-Related Variables

Body mass index (BMI) was calculated in kg/m^2 using self-reported height and weight; participants were categorized according to NIH guidelines:[33] underweight ≤18, acceptable 19–24, overweight 25–29, obese 30–34, extreme obesity (obesity II) ≥35. Respondents were asked to report on their own weight history and the current weight status of close relatives and their significant other.

Body Awareness Variables

Self-perception as overweight and/or obese was measured using two questions: "Do you consider yourself now to be overweight?" and "Do you consider yourself now to be obese?" A dichotomous summary variable was constructed to represent all individuals who responded yes to either of these items. A variable representing accuracy of self-perception of overweight or obese was constructed by comparing self-perception items with current weight status. Those who were underweight or had acceptable weight and misclassified themselves as overweight or obese were categorized as inaccurate. Those who were overweight, obese or extremely obese and did not classify themselves as at least overweight were also categorized as inaccurate.

Body Satisfaction Variables

Dissatisfaction with Body Weight. Ideal weight was assessed by asking respondents, "How much would you like to weigh?" Ideal weight was subtracted from self-reported current weight to provide an indicator of dissatisfaction with body weight. Negative scores on the Dissatisfaction with Body Weight score indicate a desire to weigh less, and positive scores indicate a desire to weigh more. A three-category summary variable for dissatisfaction with body weight was created with the following response categories: "Desires to stay the same weight" when ideal weight equaled current weight; "Desires to weigh less" when ideal weight was less than current weight and "Desires to weigh more" when ideal weight was greater than current weight.

Area-Specific Body Satisfaction. To measure area-specific body image perceptions, participants were asked to think of the following body parts: arms, stomach, chest, hips, thighs, buttocks and legs. The participants were asked to state if they would like for specific body parts to be bigger, smaller or stay the same.[34] This scale is an adaptation of the Body Cathexis Scale[35] by Resnicow et al.[34] for the GO GIRLS Study, a nutrition and physical activity program for low-income, overweight African-American, adolescent females. This measure represents the participant's actual satisfaction with their body parts. Each item was scored using a Likert Scale, where 1 is "bigger", 2 is "smaller", and 3 is "stay the same". Three summary variables were created: 1) "Number of body areas desired to be smaller," a count of the body areas listed above where the response was "smaller;" 2) "Number of body areas desired to be larger," a count of the body areas listed above where the response was "bigger" (both count variables have a minimum score of 0 and a maximum score of 7); and 3) "Desires upper torso to be larger" categorized individuals by "desire for chest and/or arms to be larger" versus "would keep chest and/or arms to stay the same or smaller." This dichotomous variable represents a desire for greater muscularity in upper body.

Perceived Impact of Weight Variables

Perceived Risk of Disease Due to Weight. Three statements related to respondents' perception that their weight put them at risk for heart disease, cancer and diabetes were included. Respondents indicated the extent of agreement with each item using a Likert scale of five anchored points, which included "strongly agree," "agree," "undecided," "disagree" or "strongly disagree." Each question was dichotomized to represent perceived risk for each condition; the response categories were "strongly agree or agree" versus "undecided", "disagree" and "strongly

disagree". A summary variable for perceived risk of disease due to weight was created to indicate a perceived risk for any disease due to weight (heart disease, cancer or diabetes) compared with those who did not perceive any risk for any one of the three chronic illnesses stated.

Perceived Impact of Weight on Social Interactions. The Perceived Impact of Weight on Social Interactions Scale (PIWSIS) was operationalized with a set of 13 items adapted from previous studies, mostly related to social interactions of young adults with chronic health conditions.[36,37] The items formed one 13-item subscale, which assessed the respondent's perceptions of the extent to which their weight negatively influenced social interactions (e.g., because of my weight people often treat me differently). Respondents indicated the extent of agreement with each item using a Likert scale of five anchored points, which included "strongly agree," "agree," "undecided," "disagree" or "strongly disagree." Individual scores are calculated by summing the answers of the 13 items. The total score for the subscale can range from 13–65, with lower scores indicating perceptions of greater negative impact. The standardized alpha for a subscale using these 13 items was 0.94, indicating high reliability for this subscale. In this study, scores on PIWSIS were correlated with measures of depression ($r=-0.13$, $p<0.05$). Those higher scores on depression were correlated with scores reflecting greater impact scores on the PIWSIS. PIWSIS items are listed in Appendix A.

A dichotomous variable was created that classified participants as "perceives high impact" versus "other." Those participants who scored in the bottom 10% of scores on the PIWSIS or responded "strongly agree" or "agree" to ≥3 of the items on the PIWSIS were classified as "perceives high impact."

Statistical Analysis

Sociodemographic, weight-related, self-perception of body size and body image satisfaction variables were summarized using means and frequencies. All variables were stratified by gender. Chi-squared tests and t tests were used to determine if there was a statistically significant difference between males and females. For each gender group, Chi-squared and t tests were performed to assess the association of perceived impact of weight variables and body satisfaction, weight-related variables and sociodemographic variables. A gender comparison of self-perception of body size and perceived impact of weight-by-weight status was examined in a weight-stratified analysis of respondents with a BMI ≥25 kg/m^2. For each weight status category (overweight, obese and extremely obese), Chi-squared tests and t tests were used to compare variables by gender. In addition, one-way ANOVA tests were conducted to test for linear associations between

Table 1. Demographic characteristics by gender (N=318)

Characteristics	N	Total %	Female[a] %	Male[a] %	P Value
Marital Status					
Single, never married	295	92.8	93.0	92.3	NS
Married or living together	11	3.5	3.7	2.9	
Separated/divorced/widowed	12	3.8	3.3	4.8	
≥1 children	44	13.8	14.5	12.5	NS
Income Level					NS
<$20,000	219	69.3	70.1	67.6	
$20,001–$40,000	64	20.3	20.6	19.6	
$40,001–$60,000	20	6.3	5.6	7.8	
$60,001–$80,000	6	1.9	1.9	3.0	
$80,000–$100,000+	9	2.8	1.9	3.0	
Age (years)		23.5 ± 4.8	23.1 ± 4.8	24.3 ± 6.1	0.05
Health Status					
Excellent	48	15.1	13.2	18.7	NS
Very good	130	40.9	39.5	43.9	
Good	113	35.5	36.8	31.8	
Fair	23	7.2	9.1	4.7	
Poor	4	1.3	1.4	0.9	

a: Sample size for males (n=104) and females (n=214)

continuous variables and increasing weight status.

Multivariate logistic regression was used to assess the association between weight-related variables and body satisfaction variables with the perceived impact of weight variables, while controlling for sociodemographic variables.

Multiple linear regression analyses, stratified by gender, were used to examine the association between weight-related variables and self-perception of body size variables with PIWSIS, while controlling for sociodemographic variables. All regression analyses were gender-specific (i.e., separate models for males and females). Only variables associated at the $p<0.05$ statistical level of significance were included in the regression analysis. Data were analyzed using SPSS (version 9.0, 1999 SPSS Inc., Chicago, IL) with statistical significance at the $p<0.05$.

RESULTS

Table 1 shows demographic information by gender. The majority of the sample was single and U.S. citizens. Approximately, 15% of the sample had ≥1 children. Approximately two-thirds of the sample were employed; 54% received financial support from family; 33% received financial aid; 19% had savings or investments; 70% reported an annual income of <$20,000; and 91.5% reported their health status as good, very good or excellent. Males were slightly older than females. No other statistically significant differences were found on demographic variables when compared by gender.

Table 2 compares current weight status, family weight history and perceived impact of weight on health and social interactions by gender. As expected, male respondents had a higher average BMI than female respondents (25.9 ± 4.4 vs. 24.5 ± 5.2, respectively, $p<0.05$). Approximately 42% of the sample was overweight, obese or extremely obese. Male respondents (12.5%) were more likely than female respondents (5.1%) to be obese (BMI 30–34).

No statistically significant differences were found on family weight history variables when compared by gender. Very few respondents reported being overweight as a child (17%). Approximately 61% reported ≥1 close family member who was currently overweight, with the mother being the family member most often mentioned as overweight.

Very few respondents (16.0%) perceived a risk of any disease, cancer (7.9%), diabetes (12.3%) or heart disease (12.3%) due to their weight. Of those

Table 2. Weight status, family weight history and perceived impact of weight on health and social interactions by gender (N=318)

Characteristics	N	Percent	Female (N=214) %	Male (N=104) %	P Value
Weight-Related Variables					
Current Weight Status					0.02
Underweight (BMI <19)	23	7.2	9.8	1.9	
Acceptable weight (BMI 19–24)	162	50.9	51.9	49.0	
Overweight (BMI 25–29)	91	28.6	28.0	29.8	
Obese (BMI 30–34)	24	7.5	5.1	12.5	
Extremely Obese (≥35)	18	5.7	5.1	6.7	
Family Weight History					
Overweight as child	54	17.0	17.8	15.4	NS
≥1 family member overweight	195	61.3	64.0	55.8	NS
Mother overweight	116	36.5	39.3	30.9	NS
Father overweight	65	20.4	20.6	20.2	NS
Significant other overweight	33	10.4	11.7	7.7	NS
Perceived Impact of Weight because of Weight Perceives Risk for:					
Cancer	25	7.9	8.4	6.7	NS
Diabetes	39	12.3	12.7	11.5	NS
Heart disease	39	12.3	13.1	10.6	NS
Any chronic disease	51	16.0	16.8	14.4	NS
*Perceived Impact of Weight on Social Interaction Scale (PIWSIS)**					
High Impact (scores ≤45)	30	9.4	7.0	14.4	<0.04
PIWSIS (mean ± SD)		58.0 ± 8.0	58.9 ± 7.3	56.1 ± 9.1	≤0.01

* Possible range 13–65, with 13 as highest impact

who perceived risk for any disease due to their weight, most perceived risk for both heart disease and diabetes due to their weight. There was no difference by gender on perceived risk of disease due to weight. However, obese female respondents (BMI ≥30 kg/m^2) (77.3%) were more likely than obese males (40.0%) to perceive a risk for disease due to weight (p=0.01).

Males reported lower scores on the PIWSIS scale than females (56.1 ± 9.1 vs. 58.9 ± 7.3, respectively; p<0.01), indicating that their weight had more of a negative impact on their social interactions. A greater percentage of male respondents (14.4%) had PIWSIS scores, indicating high impact, compared with female respondents (9.4%). After stratifying by weight status and gender, extremely obese males had the lowest scores (highest impact) on the PIWSIS (47.1 ± 14.5). These impact scores indicate that, for this sample of young adult African Americans, being overweight or obese negatively impacts social interactions for males more than females.

As expected, respondents who had a BMI ≥25 kg/m^2 were more likely to perceive a risk for disease due to weight compared with respondents whose BMI was <25 kg/m^2 (32.8% vs. 4.3%, respectively, p<0.01). Those respondents who perceived risk for any disease due to weight were more likely to desire a lower weight than those who did not perceive risk for any disease due to weight (88.2% vs. 49.4%, respectively, p<0.001). Since body image varies by gender, the multivariate analysis of the perceived risk for disease was stratified by gender.

Table 3 compares body awareness and body satisfaction by gender. Females were more likely to perceive themselves as overweight compared with males (31.8% vs. 18.3%, respectively, p=0.01). Male respondents were more likely than female respondents to misclassify their weight status (30.8% vs. 18.7%, respectively, p<0.05). Of the 51 male respondents who were at least overweight, only 37.3% (n=19) classified themselves as overweight. Of the 20 males who were obese (BMI ≥30), only two (10%) classified themselves as obese. Of the 82 female respondents who were at least overweight, 67.1% (n=55) classified themselves as overweight. Of the 22 females who were obese (BMI ≥30), only 32% (n=7) classified themselves as obese.

In an analysis of self-perception of body size variables by gender and weight status of the respondents with a BMI ≥25, overweight females were more likely than overweight males to perceive themselves as overweight. The same trend is apparent for obese and extremely obese females and males, although not statistically significant. Overweight males were more

Table 3. Body awareness and body satisfaction by gender (N=318), continued

Characteristics	N	Percent	Female (n=214) %	Male (n=104) %	P Value
Body Awareness					
Perceives self as overweight	87	27.4	31.8	18.3	0.01
Self-perception as obese	11	3.5	3.7	2.9	NS
Accuracy of self-perception of body *Size*					0.02
Inaccurate	72	22.6	18.7	30.8	
Body Satisfaction					
Dissatisfaction with Body Weight (Ideal weight minus current weight) (mean ± SD)		-7.30 ± 19.7	-11.2 ± 18.8	0.6 ± 19.1	<0.001
Dissatisfaction with Body Weight					
Desires to stay the same	50	15.7	17.3	12.5	<0.001
Desires to weigh less	177	55.7	64.5	37.5	
Desires to weigh more	91	28.6	18.2	50.0	
Number of body areas desired to be larger (mean ± SD)		1.52 ± 1.69	1.09 ± 1.56	2.42 ± 1.60	<0.001
Number of body areas desired to be smaller (mean ± SD)		2.10 ± 2.05	2.56 ± 2.15	1.15 ± 1.42	<0.001
Desires upper torso larger	246	77.4	81.3	69.2	0.02

likely than overweight females to desire a weight that would be classified as overweight. For extremely obese males and females, the majority desired a weight that would be classified as at least overweight. Overall, the mean ideal and healthy weights reported by males were higher than ideal and healthy weights reported by females and, as BMI category increased, so did ideal and healthy weights reported.

Over half of the respondents (56%) desired a weight lower than their current weight, and 29% of respondents desired a weight greater than their current weight. Female respondents were more likely than male respondents to desire a lower weight (64.5% vs. 37.5%, respectively). The Body Weight Dissatisfaction score for females was almost 12 lbs lower than that for males (-11.2 ± 18.8 vs. 0.6 ± 19.1, respectively, $p<0.001$). Conversely, male respondents were more likely than female respondents to desire a weight higher than their current weight (50% vs. 18%, respectively).

Most respondents (73%) desired a change (either larger or smaller) in one area of their body, with females being more likely to desire a change than males (79% vs. 61%, respectively). Males were more likely than females to desire larger upper-torso body areas. Females were more likely than males to desire smaller arms, stomach, hips, thighs, buttocks and legs. Males reported a higher mean number of body areas desired to be larger than females (2.4 ± 1.6 vs. 1.1 ± 1.6, respectively; $p<0.001$). On the other hand, females reported a higher mean number than males of body areas to be smaller (2.6 ± 2.2 vs. 1.1 ± 1.4, respectively; $p<0.001$).

Perceived Risk for Disease Due to Weight

In this study, we were interested in the association between body size awareness and body size satisfaction with the perceived risk of disease due to weight. Unadjusted analysis of perceived risk for any disease by body awareness and body satisfaction for male and female respondents revealed the following associations. For both male and female respondents, perceived risk for any disease was associated with perception of self as overweight or obese, desire for body weight to be lower, upper torso to be larger, higher number of body areas desired to be smaller, and lower number of desired body areas to be larger. Weight-related variables associated with perceived risk of disease due to weight for both males and females include overweight and obese weight status, higher BMI, overweight status as a child, and father overweight weight status. For females, mother overweight and any family member overweight were also associated with perceived risk for disease due to weight status. For males, the following demographic variables were also associated with perceived risk of disease due to weight: income of <$20,000, older age and having ever been married.

We used multiple logistic regression models to examine whether the association between body size

Table 4. Logistic regression models stratified by gender for selected sociodemographics, weight-related and body awareness variables among graduating college seniors by perceived risk for disease

	Perceived Risk for Any Disease Due to Weight			
	Female (n=214)		Male (n=104)	
Characteristics	OR	95% Confidence Interval	OR	95% Confidence Interval
Demographic Variables				
Income <$20,000/year	–	–	0.04*	0.00, 0.48
Age (years)	–	–	1.12	0.97, 1.29
Weight-Related Variables				
BMI	1.25†	0.99, 1.58	1.34	0.87, 2.07
Any family member overweight	1.48	0.27, 8.01	–	–
Father overweight	1.86	0.51, 6.70	15.08*	1.28, 177.05
Mother overweight	0.90	0.23. 3.56	–	–
Overweight as a child	6.54**	1.97, 21.76	20.53*	1.80, 234.06
Self-Perception of Body Size				
Overweight self-perception	3.78†	0.93, 15.27	3.19	0.23, 44.91
Obese self-perception	1.36	0.10, 18.32	135.27*	2.02, 9,062.80
Desires upper torso to be larger	1.29	0.23, 7.35	0.49	0.02, 10.74
Number body areas desired to be smaller	0.70	0.89, 1.75	0.84	0.44, 1.60
Number body areas desired to be larger	1.25	0.28, 1.78	0.96	0.35, 2.58
Dissatisfaction with body weight	0.99	0.94, 1.05	1.05	0.96, 1.15

† $p<0.06$; * $p<0.05$; ** $p<0.01$; – Not associated in bivariate analysis and not included

awareness and body size satisfaction with perceived risk for disease due to weight remained after adjusting for potentially confounding demographic and weight-related variables. Table 4 presents gender-specific logistic regression models for the perceived risk for disease due to weight. Male respondents who reported an income of <$20,000 per year were 25 times less likely to perceive a risk of any disease due to weight compared with those male respondents of a higher income. Male respondents who reported their father was overweight were 15 times more likely to perceive a risk of any disease due to weight compared to other male respondents. Male respondents who reported to be overweight as a child were 21 times more likely to perceive a risk of any disease due to weight compared with other male respondents. Male respondents who perceived their current weight to be obese were 135 times less likely to perceive a risk of any disease due to weight compared with other male respondents. Body dissatisfaction variables were not associated with any perceived risk for disease due to weight variables for male respondents in multiple logistic regression analysis.

For female respondents, multiple logistic regression analysis revealed that the perceived risk for any disease due to weight was only associated with being overweight as a child. Female respondents who reported being overweight as a child were 6.5 times more likely to perceive a risk of any disease due to weight compared with those female respondents who did not report being overweight as a child. Overweight self-perception and BMI approached statistical significance, as well.

Perceived Impact of Weight on Social Interactions Scale

We used multiple linear regression to examine whether the body size awareness and body size satisfaction were associated with perceived impact of weight on social interactions after adjusting for potentially confounding demographic and weight-related variables. Table 5 presents the results of the gender-stratified linear regression analyses for factors associated with PIWSIS scale. For male respondents, having an inaccurate self-perception of overweight was related to higher scores on this scale, which indicates a protective effect on the perceived impact of weight on social situations.

Female respondents with a self-perception of obesity and perceived risk for any disease due to

Table 5. Regression models for weight-related variables, self-perception variables and body dissatisfaction variables among 318 college seniors by perceived impact of weight on social interactions and sex

	Perceived Impact of Weight on Social Situations ß‡ (95% CI)	
Characteristics	**Male**	**Female**
Weight-Related Variables		
BMI	–	0.16 (-0.15, 0.47)
Extremely obese BMI ≥40	-3.52 (-12.18, 5.15)	
Any family member overweight	–	2.07* (0.07, 4.08)
Self-Perception of Body Size		
Accuracy of Self-Perception of Body Size		
Inaccurate	-4.97* (-8.84, -1.10)	–
Overweight Self-Perception		
Yes	0.63 (-5.08, 6.33)	0.08 (-2.80, 2.97)
Obese Self-Perception		
Yes	-9.49 (-20.61, 1.64)	-6.37* (-12.21,-0.54)
Because of Weight Perceives Risk for Disease		
Strongly agree/agree	–	-5.65** (-9.02, -2.29)
Body Image Satisfaction Variables		
Number of body areas desired to be larger	-0.95 (0.79, -2.52)	–
Number of body areas desired to be smaller	–	0.75* (0.02, 1.48)
R^2	0.17	0.14
Constant	61.01 (57.56, 64.47)	55.69 (49.06, 62.32)

– Not associated in bivariate analysis and not included; a: Sample size for models (male n=104; females=214); * p<0.05; ** p<0.01

weight had lower scores, which indicate a greater perceived impact of weight on social interaction. However, female respondents with any overweight family members and increasing number of body areas desired to be smaller had higher scores on this scale, which indicates a protective effect on the perceived impact of weight on social situations.

DISCUSSION

This study suggests that young African-American adults may have perceptions of overweight that differ from those of the medical community. As seen in other studies,[13,16,21] males are more likely than females to inaccurately classify their weight. The data presented here support earlier research showing that women's definitions of overweight, ideal weight and healthy weight are consistently lower than men's.[5,7]

A finding of great concern from this study was the lack of body awareness on acceptable weight range recommendations among the overweight and obese respondents in this study. Only 40% of obese females classified themselves as obese. This is a much higher underestimation rate than previously reported rates of underestimation by overweight African-American females.[38] For overweight male respondents, >80% did not perceive themselves as overweight. This finding was supported by a study from another historically black college/university that found that only 2% of the students were aware of the NIH guidelines for healthy weights.[39]

In this study, body dissatisfaction was expressed in many ways and, as in other studies, females were more likely than males to experience some body dissatisfaction.[16,40-42] Female respondents' body dissatisfaction was more related to desiring a lower body weight than to area-specific body dissatisfaction. It may be that women associated body image with size rather than any one part of the body.

Male respondents had a high level of dissatisfaction with area-specific body parts, especially their upper torso, with most male respondents wanting areas to be larger. However, although almost half of the male respondents were at least overweight, only a third of males desired to weigh less. It has been theorized in another study of body satisfaction in African Americans that the reason for the high level of body dissatisfaction in African-American males may be attributable to muscle tone and body fat distribution rather than just body weight per se.[16] The finding that African-American males base their body image perceptions more on overall appearance than on body size, compared to African-American females, has also been reported in a biracial cohort study of young adults.[43]

In this sample, not all overweight respondents were dissatisfied with their weight or size. This is of concern since overweight individuals who perceive themselves within an acceptable weight range or do not experience body dissatisfaction are unlikely to pursue any weight loss activities.[38] Kumanyika et al.[44] proposed that more tolerant attitudes and less social pressure regarding weight among African Americans might explain the observed racial difference in body image dissatisfaction. In this sample, obese respondents (especially male respondents) who perceived themselves as obese were most likely to perceive an impact on social interactions, which could lead to feelings of isolation and depression. In other studies of young adults with chronic illness, which included African-American participants, perceived impact was associated with poor self-esteem and depression.[36,37]

Very few participants perceived a risk for heart disease, cancer or diabetes due to their weight. Among the overweight respondents in our sample, perceived risk increased with obese and extremely obese status. However, among overweight respondents, almost 20% of females perceived an increased

Appendix A. Items from the Perceived Impact of Weight on Social Interactions Scale (PIWSIS). Response categories for this scale are "strongly agree," "agree," "undecided," "disagree" or "strongly disagree."

1. My weight effects whether people want to be friends with me.
2. My weight affects whether people like me or not.
3. Because of my weight people often treat me differently.
4. My weight effects whether or not I am asked to go out on dates or come to a party.
5. Because of my weight, close friends don't push me to do things.
6. My weight gets in the way of meeting new people.
7. Because of my weight, other people think I am lazy.
8. Other people think I use my weight as an excuse not to do things.
9. Because of my weight, I have to work hard to prove myself to others.
10. My weight gets in the way of keeping friends of the opposite sex.
11. Because of my weight, people in authority treat me differently.
12. My weight keeps me from attending social gatherings.
13. Other people do not recognize my achievements because of my weight.

risk for heart disease due to their weight. Among obese and extremely obese males, the perceived risk of a chronic disease was <45%. However, perceived risk for cancer, diabetes and heart disease due to weight was an important predictor for perceived impact of weight on social interactions among female respondents. This finding indicates that the perceived impact of weight influences multiple areas of daily living.

Multivariate analysis revealed that factors associated with perceived risk for disease varied by gender. For male respondents, income of >$20,000 per year, father overweight status, being overweight as a child and body awareness (self-perception of obesity) were associated with perceived risk for disease due to weight. Body satisfaction variables were not associated with perceived risk for disease due to weight. These results suggest that weight-related experiences during childhood and with family, as well as body awareness, are influential on the perception of risk for male respondents. For female respondents, being overweight as a child was associated with the perceived risk for disease due to weight, and body awareness approached statistical significance. These findings suggest that, for females, weight-related experiences during childhood and body awareness are important influences on perceived risk for disease due to weight. These results imply that while designing a health-promotion program for young-adult, African-American college students, improving body awareness is an important area to consider.

It is interesting that having a personal connection with obesity (e.g., having experienced childhood obesity or having a parent who is overweight) was found in the study to be significantly associated with a greater perception of disease risks. This is very consistent with the research literature, which has shown that self-protective health practices tend to vary with personal experience with an undesirable life event.[45] The suggestion here is that when formulating strategies to better educate such student populations about obesity-related disease risks, invulnerability must be factored in.

Perceived risk for disease due to weight is also an important factor for perceived impact of weight on social interactions for females. Perceived impact of weight on social interactions had the greatest impact on extremely obese males. Social interactions may not be as impacted for females in this study, compared with males in this study, due to social acceptability of a more voluptuous figure for African-American females. Obese females may be considered curvaceous and attractive. Males may desire to be larger in terms of being more muscularly fit; however, extremely obese males often do not appear fit and therefore would not be as acceptable to females.

There are several limitations in this study. First, the study was cross-sectional, and inferences about causality cannot be made. For example, considering our finding that BMI was associated with greater perceived impact on social interaction for female respondents, we cannot conclude that perceived impact of weight on social interactions is a result of BMI.

Second, the study utilized a convenience sample, so our generalizability to the entire graduating class or graduates of HBCUs may be limited. Health-promoting behaviors are directly linked with socioeconomic status and especially with educational level. As college graduates, these study participants are likely to be at the higher end of the spectrum of adherence to health guidelines, awareness of health issues and access to healthcare through student health services. This limits the generalizability of these findings.

Third, body weights and heights were self-reported, so it is possible that weighing participants would have yielded different results. Previous studies have generally reported a 90% correlation between self-reported and actual weights, and that 20% of adults underestimate their actual weights by ≥2 kg.[46] However, even though the error for self-reported weight is small, it has been noted that as body weight increases so does the size of the self-reported weight error, especially in overweight women.[47] Therefore, our estimates of weight are likely to be underestimated. Finally, the data were collected while graduating college seniors waited in line to collect their graduation regalia. This brief window is one of the most aberrant times in a student's entire academic experience and raises the question of whether the timing of this data collection could have influenced students' attitudes and self-perceptions.

A strength of this study is that it provides data on young African-American adults, a relatively understudied group with respect to self-perception of body size, body image, and perceived impact of weight on social interactions and future health.

The prevalence of obesity is increasing, with African-American youth experiencing some of the highest rates. It is very important that this population have an accurate perception of their body weight and an awareness of healthy body weight due to the risks associated with incorrect perceptions of one's own weight. Health professionals who work with young African-American adults can use the findings from this study to inform their health-promotion projects. This study suggests that a key element of any health-promotion campaign for young-adult African Americans should focus on defining acceptable weights for young adults. Health-promotion campaigns should be gender-specific based on our findings that different factors predicted per-

ceived risk for disease due to weight by gender in this study. Young adulthood is a window of opportunity to prevent chronic illness since many health-promoting behavior patterns are being formed during this time. Raising awareness of acceptable weights in young-adult African Americans can potentially lead to healthier weight goals and improved health in this population.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Yvonne Bronner, Connye Kuratko, Shaquana Divers, Kia Tolson, Terry Sears, Edna Green and Donna Baird for their help with the study planning, data collection and data entry. We also thank the college students whose cooperation made this research possible.

REFERENCES

1. U.S. Department of Health and Human Services. Healthy People 2010. 19. Nutrition and Overweight. www.health.gov/healthypeople/document/HTML/Volume2/19Nutrition.htm#_Toc490383127. Accessed 10/24/05.

2. Lowry R, Galuska DA, Fulton JE, et al. Physical activity, food choice, and weight management goals and practices among U.S. college students. *Am J Prev Med.* 2000;18:18-27.

3, Thompson SN, Chambers JW. African self-consciousness and health-promoting behaviors among African-American college students. *J Black Psychol.* 2000;26:330-345.

4. Madrigal H, Sanchez-Villegas A, Martinez-Gonzalez MA, et al. Underestimation of body mass index through perceived body image as compared to self-reported body mass index in the European Union. *Public Health.* 2000;114:468-473.

5. Chang VW, Christakis NA. Self-perception of weight appropriateness in the United States. *Am J Prev Med.* 2003;24:332-339.

6. Donath SM. Who's overweight? Comparison of the medical definition and community views. *Med J Aust.* 2000;172,375-377.

7. Crawford D, Campbell K. Lay definitions of ideal weight and overweight. *Int J Obes Relat Metab Disord.* 1999;23:738-745.

8. Strauss RS. Self-reported weight status and dieting in a cross-sectional sample of young adolescents: National Health and Nutrition Examination Survey III. *Arch Pediatr Adolesc Med.* 1999;15:741-747.

9. French SA, Story M, Neumark-Sztainer D, et al. Ethnic differences in psychosocial and health behaviors correlates of dieting, purging, and binge eating in a population-based sample of adolescent females. *Int J Eat Disord.* 1997;22:315-322

10. Steen SN, Wadden TA, Foster GD, et al. Are obese adolescent boys ignoring an important health risk? *Int J Eat Disord.* 1996;20:281-286.

11. Hart EA, Leary MR, Rejeski WJ. The measurement of social physique anxiety. *J Sport Exer Psychol.* 1989;11:94-104.

12. Russell WD. Comparison of self-esteem, body satisfaction, and social physique anxiety across males of different exercise frequency and racial background. *J Sport Behav.* 2002;25:74-90.

13. Pingitore R, Spring B, Garfield D. Gender differences in body satisfaction. *Obes Res.* 1997;5:402-409.

14. Allan JD, Mayo K, Michel Y. Body Size Values of White and Black Women. *Res Nurs Health.* 1993;16:323-333.

15. Anderson LA, Eyler AA, Galuska DA, et al. Relationship of Satisfaction with Body Size and Trying to Lose Weight in a National Survey of Overweight and Obese Women Aged 40 and Older, United States. *Prev Med.* 2002;35:390-396.

16. James DCS. Gender differences in body mass index and weight loss strategies among African Americans. *J Am Diet Assoc.* 2003;103:1360-1362.

17. Field AE, Coakley EH, Must A, et al. Impact of overweight on the risk of developing common chronic diseases during a 10-year period. *Arch Intern Med.* 2001;161:1581-1586.

18. Thompson SH, Sargen RG. Black and white women's weight-related attitudes and parental criticism of their childhood appearance. *Women Health.* 2000;30:77-92.

19. Eisenberg ME, Neumark-Sztainer D, Story M. Associations of weight-based teasing and emotional well-being among adolescents. *Arch Pediatr Adolesc Med.* 2003;157:733-738.

20. Katz ML, Gordon-Larsen P, Bentley ME, et al. "Does skinny mean healthy?" Perceived ideal, current and healthy body sizes among African-American girls and their female caregivers. *Ethn Dis.* 2004;14:533-541.

21. Ogden J, Steward J. The role of mother-daughter relationship in explaining weight concerns. *Int J Eat Disord.* 2000;28:78-83

22. Tienboon P, Rutishauser IH, Wahlqvist ML. Adolescents' perception of body weight and parents' weight for height status. *J Adolesc Health.* 1994;15:263-268.

23. Fishbein M, Azjen I. Belief, Attitude, Intention, and Behavior: an Introduction to Theory and Research. Reading, MA: Addison-Wesley Publishing; 1975.

24. Quadrel MJ, Fischoof B, Davis W. Adolescent (in)vulnerability. *Am Psychol.* 1993;48:102-116.

25. Sheppard JA, Helweg-Larsen M, Ortega L. Are Comparative Risk Judgments Consistent Across Time and Events? *Personality and Social Psychology Bulletin.* 2003;29:1169-1180.

26. Green JS, Grant M, Hill K, et al. Heart disease risk perception in college men and women. *J Am Coll Health.* 2003; 51:207-211.

27. Lawson EJ. A narrative analysis: a black woman's perception of breast cancer and early breast cancer detection. *Cancer Nurs.* 1998;21:421-429.

28. Paeratakul S, White MA, Williamson DA, et al. Sex, race/ethnicity, socioeconomic status, and BMI in relation to self-perception of overweight. *Obes Res.* 2002;10:345-350.

29. Sheets V, Ajmere K. Are romantic partners a source of college students' weight concerns? *Eat Behav.* 2005;6:1-9.

30. Ball K, Crawford D, Kenardy J. Longitudinal relationships among overweight, life satisfaction, and aspirations in young women. *Obes Res.* 2004;12:1019-1030.

31. Myers A, Rosen JC. Obesity stigmatization and coping: relation to mental health symptoms, body image, and self-esteem. *Int J Obes Relat Metab Disord.* 1999;23:221-230.

32. Rogge MM, Greenwald M, Golden A. Obesity, stigma, and civilized oppression. *ANS Adv Nurs Sci.* 2004;27:301-315.

33. Kuczmarski RJ, Ogden C, Grummer-Strawn LM, et al. CDC Growth Charts: United States. Hyattsville, MD: U.S. Department of Health and Human Services, 2000. NCHS Advance Data Report No. 314.

34. Resnicow K, Yaroch AL, Davis A, et al. GO GIRLS!: Results From a Nutrition and Physical Activity Program for Low-Income, Overweight African American Adolescent Females. *Health Educ Behav.* 2000;27:616-631.

35. Secord PF, Jourard SM. The appraisal of body-cathexis: body-cathexis and the self. *J Consult Psychol.* 1953;17:343-347.

36. Gross SM. Mental Health and Eating Habits of Young Women with Disabilities [dissertation]. Baltimore (MD):Johns Hopkins University; 1996.

37. Ireys HT, Werthamer-Larsson LA, Kolodner K, et al. Mental Health of Young Adults with Chronic Illness: What Mediates Risk? *J Pediatr Psychol.* 1994;19:205-222.

38. Kuchler F, Variyam JN. Mistakes were made: misperception as a barrier to reducing overweight. *Int J Obes.* 2003;27:856-861.

39. Horton N, Harrel K, King D. Perceptions of weight and its importance in maintaining wellness in a population of African American college students. *Obes Res.* 2003;11(Suppl 1):A144.

40. Lokken K, Ferraro FR, Kirchner T, et al. Gender differences in body size dissatisfaction among individuals with low, medium, or high levels of body focus. J Gen Psychol. 2003;130:305-310.

41. Bhuiyan AR, Gustat J, Srinivasan SR, et al. Differences in body shape representations among young adults from a biracial (Black-White), semirural community: the Bogalusa Heart Study. *Am J Epidemiol.* 2003;158:792-797.

42. Cachelin FM, Rebeck RA, Chung GH, et al. Does ethnicity influence body-size preference? A comparison of body image and body size. *Obes Res.* 2002;10:158-166.

43. Smith DE, Thompson JK, Raczynski JM, et al. Body image among men and women in a biracial cohort: the CARDIA Study. *Int J Eat Disord.* 1999; 25:71-82.

44. Kumanyika SK, Wilson JK, Guilford-Davenport M. Weight-related attitudes and behaviors of Black women. *J Am Diet Assoc.* 1993;93:416-422.

45. Witte K. Preventing teen pregnancy through persuasive communications: realities, myth and hard-fact truths. *J Community Health.* 1997; 22:137-154.

46. Villanueva EV. The validity of self-reported weight in U.S. adults: a population-based cross-sectional study. *BMC Public Health.*[serial online] 2001 [cited 2001 November 6];1:11:[12 screens]. www.pubmedcentral.gov/articlerender.fcgi?tool=pubmed&pubmedid=11716792. . Accessed 10/24/05.

47. Rowland ML. Self-reported weight and height. *Am J Clin Nutr.* 1990;52: 1125-1133. ■

We Welcome Your Comments

The *Journal of the National Medical Association* welcomes your Letters to the Editor about articles that appear in the *JNMA* or issues relevant to minority healthcare. Address correspondence to ktaylor@nmanet.org.

MUSC
MEDICAL UNIVERSITY OF SOUTH CAROLINA

Clinical and Research Faculty Positions Available
Department of Medicine/College of Medicine
Medical University of South Carolina
MUSC is an Equal Opportunity Employer and actively seeks diversity in its faculty, staff and students.

Division of Cardiology
Division of Emergency Medicine
Division of Endocrinology, Diabetes and Medical Genetics
Division of Gastroenterology and Hepatology
Division of General Internal Medicine/Geriatrics
Division of Hematology/Oncology
Hospitalist Program
Division of Infectious Disease
Division of Nephrology
Division of Pulmonary and Critical Care
Division of Rheumatology and Immunology

Interested applicants may apply on-line at www.musc.edu or may forward a CV to glanvilf@musc.edu or to Frances Glanville, Department of Medicine, 96 Jonathan Lucas Street, PO Box 250623, Charleston, SC 29425.

Make an impact on the Development of Novel Agents, come work at the National Cancer Institute!

Department of Health and Human Services (DHHS)
National Institutes of Health (NIH)
National Cancer Institute (NCI)
Division of Cancer Treatment and Diagnosis (DCTD)
Cancer Therapy Evaluation Program (CTEP)

The Investigational Drug Branch (IDB) is seeking physicians with extensive experience in the conduct of clinical research and development of investigational agents for the position of Medical Officer, GS-15. Candidates should also be board-certified in internal medicine and board-certified or board-eligible, or have the equivalent training and experience, in medical oncology. U.S. citizenship is required.

The DCTD is responsible for preclinical and clinical development of new agents for the treatment of cancer. The Developmental Chemotherapy group focuses on cell signal agonists/antagonists, cell cycle and cell death regulators, antiangiogenesis agents and new cytotoxic agents. The Biologics Evaluation group is responsible for preclinical and clinical development of novel agents for the treatment of cancer including differentiation agents, tumor vaccines, cytokines, immunotoxins, monoclonal antibodies, anti-sense agents and gene therapies. The Medical Officers will be responsible for formulating and executing national clinical development plans for investigational agents sponsored by the DCTD. They will also be involved in evaluating preclinical data and selecting agents for clinical development by the Division. The positions require extensive interaction with basic scientists, the Developmental Therapeutics Program of DCTD, intramural and extramural clinical investigators, clinical cooperative groups, pharmaceutical companies, and FDA. Opportunities for continued clinical activity and participation in clinical research are also encouraged on an individual basis in collaboration with the intramural Center for Cancer Research.

Salaries for these positions range from $103,947 to $135,136 per annum. Candidates may be eligible for an added allowance of up to $30,000 per annum, as well as additional substantial bonuses/allowances, depending on qualifications. Benefits include health and life insurance options, retirement, paid holidays and vacation leave.

To apply for this position, please visit: http://jobsearch.usajobs.opm.gov/a9nih.asp and keyword search for Vacancy Announcement, NCI-05-94964. You must apply by the closing date of **01/03/2006**. For questions about applying to the VA, please contact Mary Lou Weathers, on (301) 402-5059.

For more information about the positions, please contact James Zwiebel, M.D. on (301) 496-1196.

DHHS, NIH and NCI are Equal Opportunity Employers.