

## Body Mass Index and Body Size Perception: A Normalizing of Overweight and Obesity among Diverse College Students

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### Abstract

The present study investigated actual body size as measured by the Body Mass Index in comparison to self-reported body size among diverse college student population. The study was conducted at a large public university in the western United States. Of the random sample of 15,000 enrolled students selected to receive an electronic survey, a total of 1,798 students elected to participate. Normalizing of overweight and obesity was found among study participants. The results from this survey indicate that, despite the fact that the majority of participants engaged in weight management methods, all gender and ethnic groups underreported instances of overweight and obesity, as well as discrepancies between perceived body image and actual body size. Implications for health promotion and future research are highlighted.

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### Introduction

#### Overweight and Obesity

Nationally, an epidemic not infectious in nature but equally dangerous has caused unnecessary early deaths, numerous chronic diseases, and strained healthcare budgets. Overweight and obesity have led to health problems such as diabetes, hypertension, coronary heart disease, stroke, gallbladder disease, cancer, breathing problems, and osteoarthritis (Weight-control Information Network [WIN], 2007). The World Health Organization (2010) defines overweight and obesity as conditions in which excess body fat accumulation presents health risks. The most common measure of overweight and obesity is the Body Mass Index (BMI), which is determined by the individual's weight and height. Individuals with a BMI of 30 or higher are considered to be obese, while individuals with a BMI between 25 and 29.9 are considered to be overweight. Berrington de Gonzalez et al. (2010) found that high BMI is associated with increased mortality from cancers and cardiovascular disease. According to the National Health and Nutrition Examination

Survey (NHANES), over 72 million adults in the United States were considered obese in 2005-2006 (Ogden, Carroll, McDowell, & Flegal, 2007). Overweight adults comprise about two-thirds of the United States population (WIN, 2007). Often college students are thought to be some of the healthiest young adults; however, about 20% of college students in a nationwide survey were considered overweight and 11% were obese (American College Health [ACHA], 2009).

Public health programs are launched to fight this epidemic in schools, workplaces, and communities in order to slowly sway the rising tide of obesity. Costly healthcare for overweight and obesity have fueled the already mounting expenditures paid by public and private funds (National Center for Chronic Disease Prevention and Health Promotion, 2009). In regards to cost, one study estimated that annual spending was as much as \$92.6 billion in the United States for obesity and overweight related medical expenditures (Finkelstein, Fiebelkorn, & Wang, 2003). On college campuses, health education programs focus mainly on alcohol, tobacco,

other drugs, sexual health, and mental health; there has been limited focus on weight issues.

Disparities in rates of overweight and obesity have been identified among different ethnicities and between genders in large studies such as NHANES. Fifty three percent of African American and 51% of Mexican American women, ages 40-59, were obese compared to 39% of White women of the same age (Ogden et al., 2007). Men were also more likely to misperceive their overweight and obesity than women in another recent study (Dorsey, Eberhardt, & Ogden, 2009). A study of college students indicated that African American and Hispanic males were more likely to be overweight and obese than White and Asian males (Nelson, Gortmaker, Subramanian, Cheung, & Wechsler, 2007); results were similar for females. The study also found that Asian college students had the lowest prevalence of overweight and obesity.

### **Perception of Weight**

Studies have shown that the perception of one's weight is important in the cognition of health risks (Dorsey et al., 2009; Paeratakul, Whiate, Williamson, Ryan, & Bray, 2002; Potti, Milli, Jeronis, Gaughan, & Rose, 2009). Bodyweight perception affects eating, dieting, exercise, and other health behaviors. This influence of bodyweight perception upon actual body weight is illustrated in the CARDIA study, a longitudinal, multi-city study conducted between 1985 and 2006 (Lynch, Liu, Wei, Kiefe, & Greenland, 2008). Women who perceived themselves as overweight or obese were more likely to lose weight over time, whereas those women who felt they were normal weight (even though they were overweight or obese) were more likely to gain weight during the study period. Additionally, in one meta-analysis, male body image and weight perceptions varied among different ethnicities (Ricciardelli, McCabe, Williams, & Thompson, 2007). Instances of overweight were less likely to be reported. Although African American males demonstrated a propensity for larger body size than White males, they possessed a more positive body image. Asian body image studies show conflicting results, which may be due to

the great variation among Asian cultural groups (Ricciardelli et al., 2007).

The outcomes of another recent study of race and gender indicated that White and African American girls were more likely to perceive themselves as overweight despite their actual weight (Logio, 2003). This misperception of body image led to unhealthy behaviors, including eating disorders.

Sociocultural elements are critical in the development of body image and factor into the racial/ethnic variations of obesity/overweight (Dorsey et al., 2009). For example, the cultural pressure to be thin does not seem to affect African Americans as greatly as it does Whites (Lynch et al., 2008). African American women have been reportedly more satisfied with their current weight and have perceived their weight to be ideal, even if they are overweight.

Body image dissatisfaction affects both genders and is influenced by both culture and society, including media images (Forrest & Stuhldreher, 2007; Wharton, Adams, & Hampl, 2008). The dissatisfaction or distortion of body weight is an issue not only affecting women; men suffer from this perception problem as well. Males often perceive themselves as smaller than they are, due to a desire for a larger or more muscular body. In one previous study, perception of being overweight or obese among college students has been reported at about 33%; however, only 28.3% of respondents were actually overweight or obese (Wharton et al., 2008).

In this study, we sought to extend the findings of gender and racial differences in a college population with regards to: 1) actual body size in relation to perceived body size; 2) possible underreporting of overweight and obesity; and 3) weight management strategies. Our research will assist with the development and implementation of meaningful chronic disease prevention programs on college campuses.

### **Methods**

The current study's participants included 1,798 college students from a large public university in

the western United States. Their age range was between 18 and 72 years old (M = 24.5, SD = 7.2). There were 1,281 females (72%) and 498 males (28%). Of the 1,798 students, 55 were African American (3%), 347 Asian American (19%), 346 Latino/Hispanic (19%), and 776 White (43%). Sixteen percent of respondents either reported as Other or declined to state their ethnic background. There were 11 freshmen (1%), 308 sophomores (17%), 370 juniors (21%), 772 seniors (44%), and 306 graduate students (17%).

Participants for this study were recruited via e-mail from a random sample of 15,000 enrolled students. This recruitment e-mail contained the Informed Consent to participate in the study. The response rate for this study was 12%. Those who agreed to the Informed Consent completed the anonymous survey online. Incentives given to the first 404 respondents who completed the survey included an MP3 player, bookstore gift cards, and gift certificates. The university's Institutional Review Board approved this study.

The authors developed an online survey to investigate health issues among college students and their implications for health education. Survey questions included: demographic information, actual weight, height, and body image ("Would you identify yourself as... within normal range of body weight, overweight, underweight, or obese?"). In addition, participants were asked, "During the past 12 months, have you tried to manage your weight?" and "How have you tried to manage your weight?" Body Mass Index (BMI) for each participant was calculated by dividing the weight (in kilogram) by the square of height (in meter). BMI has been demonstrated to correlate well with direct measure of body fat (Mei et al., 2002). Utilizing BMI categories provides healthcare professionals a health-weight assessment tool. Four classifications of the BMI are used in this study: Underweight (<18.5), Normal (18.5-24.9), Overweight (25-29.9), and Obese (>30) (National Heart, Lung, and Blood Institute, 2010).

### Results

Results indicated that actual BMI for female participants was 18% overweight and 11% obese. The female participants' perceived body images were 28% overweight and 3% obese. Male participants' actual BMI was 30% overweight and 16% obese. Male perceived body images were 26% overweight and 2% obese.

**Table 1**

**Body image misperception: Paired sample *t*-test for body image and BMI categories**

	<i>t</i>	<i>p</i>
<b>All Participants</b>	10.57	<i>p</i> < .001*
<b>Female</b>	3.32	<i>p</i> < .001*
<b>Male</b>	14.16	<i>p</i> < .001*
<b>African American</b>	2.43	<i>p</i> < .05*
<b>Asian American</b>	1.93	<i>ns</i>
<b>Latino/Hispanic</b>	6.23	<i>p</i> < .001*
<b>White</b>	7.02	<i>p</i> < .001*

*ns* = not significant; \* = significant

Paired sample *t*-tests were used to assess the differences in the body image and BMI of each participant. Statistically significant results were found for all gender and ethnic variables, except for Asian Americans (see Table 1). In addition, all gender and ethnic categories underreport overweight and obesity. Male participants underreport overweight significantly more than female participants,  $\chi^2(1, N = 1,684) = 84.85, p < .001$ . Male participants also underreport obesity significantly more than female participants  $\chi^2(1, N = 1,684) = 14.97, p < .001$ . Among the four ethnic groups, the differences in the underreporting of overweight is not significant,  $\chi^2(3, N = 1,451) = 0.96, p = .81$ . But there was a significant difference in the underreporting of obesity among the four ethnic groups,  $\chi^2(3, N = 1,451) = 19.18, p < .001$ . Asian American college students had the lowest percentage of underreporting of obesity (4%)

while Latino college students had the highest

(14%). See Table 2 for details on gender, ethnicity, and percent of students who underreport overweight and obesity.

**Table 2**

**Percent of students who underreport overweight and obesity by gender and ethnicity**

	<i>Overweight %</i>	<i>Obesity %</i>
<b>Gender***</b>		
<b>Female</b>	5	8
<b>Male</b>	18	14
<b>Ethnicity***</b>		
<b>African American</b>	8	12
<b>Asian American</b>	7	4
<b>Latino/Hispanic</b>	9	14
<b>White</b>	8	10

\*\*\* $p < .001$ .

Participants were also asked if they had tried to manage their weight in the past 12 months by selecting from the following categories: exercise, portion control, diet pills, fasting days, joining a weight loss program, and vomiting/laxatives. Seventy percent of all participants reported trying to manage their weight. The most commonly reported strategy was exercise for both females (65%) and males (49%). Overall, though, healthy weight management methods were not practiced. See Table 3 for the detailed breakdown of weight management practices.

**Discussion**

Similar to findings from a previous study on BMI and self image (Logio, 2003), the present study found a discrepancy between self-reported body image and actual body size (assessed by

BMI) for both gender and ethnic variables among college students. A recent study by Rahman and Berenson (2010), also illustrated comparable findings regarding the normalizing or misperception of overweight and obesity.

Lack of true assessment about one’s own body size is a significant deterrent to a healthy lifestyle. As exhibited in the results section, a significant number of participants demonstrated their lack of awareness of their true body size by underreporting of overweight and obesity. Weight management strategies were also not often used even for those who are overweight or obese. Awareness of the health risks of overweight/obesity play an important role in healthy behaviors, including diet and exercise, which would influence weight loss for prevention of chronic diseases. College students in the U.S. have the highest BMI as compared to students from 22 other countries (Wardle, Haase, & Steptoe, 2006). The issue of underassessment or misperception of overweight and obesity for U.S. college students creates a perilous combination for higher morbidity and mortality.

**Limitations and Strengths**

Limitations of this study include self-reporting measures of height and weight, which can decrease the validity of the survey due to underestimation of weight (Yun, Zhu, Black, & Brownson, 2006). Some underreporting of overweight and obese individuals may have occurred due to lack of willingness to provide this information. One respondent commented that “My weight is none of your business.” Hence, if students felt reluctant to disclose height and weight, the results may be biased. However, it has been proven that online survey respondents are more likely to report overweight or obese categories than on paper-based surveys (Smith, Smith, Gray, & Ryan, 2007). Also, college students have been considered reliable self-reporters in other studies (Shapiro & Anderson, 2003). A strength of the study was the relatively large sample size (n = 1,798), which may help to overcome these limitations.

**Implications and Conclusion**

Specific ethnic- and gender-based health education intervention is needed to increase awareness of BMI and healthy weight management strategies. The importance of developing any campus health intervention program should be done with the assistance of the target population (Gosling, Stanistreet, &

Swami, 2008). From the results of this study, African Americans, Latino/Hispanic, and males need to be targeted for campus interventions. Participatory research can include focus groups, needs assessments, and interviews to hone in on a more successful health promotion program aimed at healthy behaviors to combat overweight and obesity (Gosling et al., 2008).

**Table 3**  
**Gender, ethnicity, and percent of students utilizing each weight management strategy**

	N	Tried to Manage Weight	Exercise	Portion Control	Diet Pills	Fasting	Weight Loss Program	Vomiting/Laxative
All Subjects	1798	70	60	52	8	7	5	3
<b>Gender***</b>								
Female	1281	74	65	58	10	8	7	4
Male	498	59	49	39	4	3	1	0
<b>Ethnicity***</b>								
African American	55	68	58	44	6	10	7	0
Asian American	347	68	59	45	6	7	1	3
Latino/Hispanic	346	74	64	53	8	6	6	3
White	776	70	62	58	10	7	6	3

\*\*\* $p < .001$ .

College health professionals have an inherently difficult task of attempting to promote healthier behaviors at a time when young adults are engaging in risky behaviors such as poor eating habits, lack of exercise, binge drinking, lack of sleep, and unsafe sex (Courtenay, 2004). As this may be the first opportunity for independent living young adults have, healthier lifestyle choices are not always elected. However, this is also a unique timeframe during which college students can be instructed on how to make healthier decisions. The incorporation of health promoting messages from a variety of campus entities and the provision of healthier opportunities (fitness, nutrition, psychological counseling, and other wellness programs) impact the health decisions of young people (Rozmus, Evans, Wysochansky, & Mixon, 2005). This is also an important moment for young adults to receive health education messages from their medical providers and college classes, as this developmental period is critical for the

formation of lifetime health behaviors (Courtenay, 2004; Kupchella, 2009).

Learning to accept oneself, no matter the body type or imperfections, is a mentally healthy concept. However, those young adults who perceive their weight as normal, when in actuality they are overweight or obese, are in danger if they are not aware of health implications for chronic diseases. For American colleges, the three vulnerable target groups are African Americans, Latinos, and males. Colleges in other countries must identify their target populations and implement evidence-based program to achieve a healthier weight management culture on their campuses.

For health promotion staff, it is important to choose interventions that encourage healthy weight management options for students. Building collaborative agreements between student health centers, fitness clubs, counseling

centers, school facilities, and physical education and nutrition academic departments to enhance student weight management may have a more profound impact on reducing rates of overweight and obesity.

The problem of weight and body image creates a challenge for health professionals, parents, and those involved with young people. Cultivating positive body image is important for a healthy

self-esteem and may decrease possible unhealthy weight management (vomiting, laxatives, diet pills) that lead to eating disorders. Aligning the perceived weight, body image, and actual weight is ideal for understanding the health needs of an individual. Targeted health promotion program for weight management should be identified for each campus utilizing needs assessment surveys and focus groups.

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