

# Weight Loss Practices and Body Weight Perceptions Among US College Students

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**Abstract. Objective:** The authors assessed associations between body weight perception and weight loss strategies. **Participants:** They randomly selected male and female college students ( $N = 38,204$ ). **Methods:** The authors conducted a secondary data analysis of the rates of weight loss strategies and body weight perception among students who completed the National College Health Assessment survey. **Results:** Half of respondents (50%) were trying to lose weight, although only 28% of students were overweight or obese. Also, 12% of respondents had inaccurate body weight perception. Women and men with inaccurate body weight perception were significantly more likely to engage in inappropriate weight loss strategies than were those with accurate body weight perception. Of all students attempting to lose weight, 38% used both diet and exercise. **Conclusions:** These data show that college students are interested in weight loss and that body weight perception plays an important role in the desire to lose weight.

**Keywords:** body image distortion, college students, diet, exercise, weight loss

The prevalence of overweight and obese individuals continues to rise in the United States, and excess adiposity is recognized as a serious health concern because of its association with increased morbidity and mortality.<sup>1</sup> In 2004, the prevalence of overweight and obese US adults reached record levels at 66.3% and 32.2%, respectively, whereas 17.4% of children and adolescents were overweight.<sup>2</sup> Although not fully understood,<sup>3</sup> death rates associated with obesity are high and strongly related to health behaviors such as diet and exercise.<sup>4,5</sup> Although government guidelines suggest that weight management efforts should include both diet and exercise—and although

data suggest that even minimal physical activity strongly affects all-cause mortality—Americans fail to engage regularly in these combined behaviors<sup>6-9</sup> and tend to adopt dietary measures alone.<sup>9</sup> Moreover, some population segments, such as university students, are prone to using inappropriate weight loss practices, such as vomiting and ingesting laxatives.<sup>10-12</sup> Nationally representative data show that college-aged women are particularly susceptible to inappropriate weight management practices.<sup>12</sup>

The university setting is an important and strategic place to promote healthy lifestyle practices such as weight management because many students are young and therefore have a large avoidable burden of chronic disease. In addition, well-established routes of communication exist for the dissemination of health-related information,<sup>13</sup> which facilitate program delivery. Last, college represents an important life transition period during which many students individuate and often form lifelong habits.<sup>14,15</sup>

However, promotion of weight loss in this population must be delivered artfully, in consideration of important determinants of healthy weight loss practices as well as the prevalence of body weight concerns that factor prominently in the motivation to lose weight.<sup>16</sup> For instance, a variety of behavior change theories related to promotion of weight management behaviors identify numerous constructs that may be more effective than others in weight management, such as knowledge, self-efficacy, and social support.<sup>16-19</sup> At the same time, inaccurate body weight perception may dispose individuals to the psychological and behavioral issues that can accompany concern about body weight. For example, relative to men, college-aged women have lower physical self-perception and a greater tendency to have a distorted body image, which is problematic because women with distorted perceptions of body weight may suffer from higher rates of body dissatisfaction and binge-

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eating behaviors than do women without these perceptions.<sup>20,21</sup> Therefore, although healthy lifestyle and weight management programs are needed, the degree to which inaccurate body weight perception may drive weight loss practices must be considered; otherwise, well-intentioned programs might propagate unhealthy behavior.

Previous researchers have examined the relationship between body mass index (BMI; an index of weight [in kg] divided by height [in m<sup>2</sup>]) and body weight perception among young adults and across demographic categories.<sup>22,23</sup> They found that women more often than men categorized themselves as overweight, with larger percentages of women than men perceiving themselves to be overweight when they were normal weight (on the basis of self-reported height and weight).<sup>22,23</sup> However, little research exists regarding the relationship between body weight perception and weight loss practices. Thus, our purpose in this study was twofold: (1) to examine the rates of various weight loss strategies and goals in male and female college students and (2) to determine the extent to which body image distortion may be associated with inappropriate weight loss strategies.

## METHODS

We collected data during the spring 2002 and 2003 semesters using the National College Health Assessment (NCHA) of the American College Health Association.<sup>24</sup> The NCHA consists of about 300 items assessing, among other parameters, student health behaviors such as nutrition and physical activity, health risks, and body weight issues. Researchers pilot-tested the NCHA 3 times between spring 1999 and fall 1999 for validity and reliability. A team of college health professionals who assessed both construct and measurement validity developed the assessment tool. They also assessed reliability of the NCHA relative to results from nationally representative databases, such as the National College Health Risk Behavior Survey, the Harvard School of Public Health College Alcohol Study, and the National College Women Sexual Victimization Study.<sup>24-26</sup> Items pertinent to this study yielded a Cronbach  $\alpha$  of .62 in the most recent reliability analysis. During the 2002 and 2003 data collection periods, 94 US postsecondary institutions self-selected to participate in the NCHA, resulting in 50,373 completed surveys. However, ACHA included in the analysis only institutions that used a random sampling technique, yielding a final combined data set of 47,755 students on 77 campuses. The overall response rate in both years was 67% and 46%, respectively.

We cleaned this data set for missing responses to pertinent items and to conform responses to BMI categories, including only participants with a calculated BMI of 15–44.9 kg/m<sup>2</sup>. We based our decision to use this BMI range, which limited the presence of implausible height or weight data, on clinical experience and previous work.<sup>27</sup> We categorized participants as underweight (BMI < 18.5), normal weight (BMI = 18.5–24.9), overweight (BMI = 25.0–29.9), or obese (BMI  $\geq$  30.0).<sup>28</sup> After these adjustments, 38,204 respondents were included in the present analyses.

Participants provided demographic information, including age, sex, living situation, relationship status, and employment status. Participants also answered questions regarding weight, including questions on self-perception of weight, weight-loss goals, and weight-loss strategies. In particular, participants were asked, “How do you describe your weight?” (*very underweight, slightly underweight, about the right weight, slightly overweight, very overweight*); “Are you trying to do any of the following about your weight?” (*I am not trying to do anything about my weight, stay the same weight, lose weight, gain weight*); and “Within the past 30 days, did you do any of the following?” (*exercise to lose weight, diet to lose weight, vomit or take laxatives to lose weight, take diet pills to lose weight, I didn’t do any of the above*). Given that vomiting, use of laxatives, and use of diet pills are not general recommendations for healthy weight loss, we categorized these practices as inappropriate. A diet combined with exercise is a general recommendation for healthy weight loss, although it also can be abused. We therefore categorized the combination as an appropriate practice.

We used self-reported height and weight to calculate BMI and categorized participants using National Institutes of Health guidelines.<sup>28</sup> Using a technique reported in previous studies,<sup>22,23</sup> we categorized respondents who perceived themselves to be overweight or very overweight when their calculated BMI was either normal weight or underweight as having inaccurate body weight perception.

We calculated frequencies of demographic characteristics, BMI categories, body weight self-perception, weight management goals, and weight management strategies. We used chi-square analyses to compare the sexes for weight loss goals and BMI categories. We conducted binary logistic regression analyses to determine the extent to which body weight perception and disordered eating behaviors were predictive of the odds of using an inappropriate weight loss method (eg, vomiting, laxatives, diet pills). We controlled demographic characteristics (ie, age, race/ethnicity, sex, relationship status, and employment status) in regression analyses. We conducted all statistical analyses using SPSS version 13.0 (SPSS Inc, Chicago, IL). We considered differences between sexes significant at  $p = .05$  and odds ratios as significantly different if 95% confidence intervals did not include 1.0. The Human Subjects Committee of the Institutional Review Board at Arizona State University approved this secondary data analysis.

## RESULTS

A majority of respondents were female (65%), white (78%), and single (97%), and the mean age of the sample was 20.3 years ( $SD = 1.71$ ; see Table 1). Among all respondents, 33.2% perceived themselves to be overweight or obese (see Table 2), whereas 28.3% were actually overweight or obese on the basis of BMI. Just more than 12% suffered from inaccurate body weight perception. A minority of women (3.2%) and men (0.4%) self-reported bulimia in the past year; similarly, 2.4% of women and 0.8% of men

**TABLE 1. Participants' Demographic Characteristics**

Characteristic	%
Sex	
Female	65
Male	35
Race/ethnicity	
White	78
Asian/Pacific Islander	7
Black	5
Hispanic	5
Other	5
Relationship status	
Single	96
Married	3
Separated/divorced/widowed	1

Note. *M* age = 20.3 years (range = 18–25); *N* = 38,204.

reported anorexia in the past year. Despite low rates of self-reported overweight and obesity, the majority of respondents (73.2%) were attempting to lose weight or maintain weight at the time of data collection. Nearly half (49.8%)

were attempting weight loss specifically. Although 72.3% of respondents exercised and 43.3% dieted to lose weight, only 37.7% used the combined strategy of diet and exercise for weight loss. Another 12.3% of respondents used inappropriate strategies for weight loss, including vomiting and using laxatives or diet pills.

Compared with 38.9% of men, 2.4% of women were overweight or obese, a significant difference ( $\chi^2[1, N = 36,282] = 1103.43, p < .001$ ). Women were significantly more likely to be attempting to lose or maintain weight ( $\chi^2[1, N = 36,416] = 3256.96, p < .001$ ). Women also were more likely to suffer from inaccurate body weight perception ( $\chi^2[1, N = 36,416] = 1050.27, p < .001$ ) and to be involved in exercise, diet, vomiting, use of laxatives, or use of diet pills for weight loss ( $\chi^2[1, N = 36,416] = 1373.17, p < .001$ ). Last, women were more likely than were men to use the combined strategy of diet and exercise for weight loss ( $\chi^2[1, N = 36,416] = 1415.02, p < .001$ ).

Binary logistic regression analyses showed that women with inaccurate body weight perception were more than twice as likely as were those with accurate perception to be involved in inappropriate weight loss practices (odds ratio [OR] = 2.01; 95% confidence interval [CI] = 1.82–2.22;  $p < .0001$ ; see Table 3). This relationship remained significant after we controlled for demographic and other

**TABLE 2. Percentage of Participants' Body Mass Index (BMI), Body Weight Perception, Body Image Distortion, Weight Management Goals, and Weight Management Strategies, by Sex**

Category	Total ( <i>N</i> = 38,204)	Women ( <i>n</i> = 23,678)	Men ( <i>n</i> = 12,738)
BMI			
Underweight	6	7	3
Normal weight	66	71	58
Overweight	21	16	30
Obese	7	6	9
Body weight self-perception			
Underweight	12	9	16
About the right weight	55	55	56
Slightly overweight	31	33	26
Very overweight	2	3	2
Body weight distortion	12	16	5
Weight management goals			
Do nothing	18	14	25
Lose weight	50	60	31
Stay the same	23	23	24
Gain weight	9	3	20
Weight management strategies <sup>a</sup>			
Exercise	72	74	68
Diet	43	47	32
Exercise and diet	38	41	28
Vomit or use laxatives	3	4	1
Use diet pills	9	10	6

Note. BMI categories (in kg/m<sup>2</sup>): underweight < 18.5, normal weight 18.6–24.9, overweight ≥ 25–29.9, obese ≥ 30. We classified individuals as suffering from body weight distortion when they perceived themselves to be overweight but were normal or underweight on the basis of BMI.

<sup>a</sup>Includes only those attempting to lose weight or maintain weight during the past 30 days.

**TABLE 3. Adjusted Odds Ratios (ORs) for Involvement in Unhealthy Weight Loss Practices**

Category	Women		Men	
	OR	95% CI	OR	95% CI
Body image distortion	2.01	1.82–2.22	1.63	1.13–2.33
Anorexia nervosa	6.98	5.84–8.33	9.40	5.87–15.01
Bulimia nervosa	23.82	20.17–28.13	20.33	11.62–35.57

*Note.* Covariates included race/ethnicity and weekly work. We added other variables, which were not significant, to the equation, including age and relationship status. ORs represent those who have unhealthy weight loss practices versus those that do not.  $R^2 = .029$ ; CI = confidence interval.

variables. However, results of this regression analysis explained only 2.9% of the variance. Men with inaccurate body weight perception were significantly more likely to be involved in inappropriate weight loss practices than were those with accurate perception (OR = 1.63; 95% CI = 1.13–2.33;  $p = .008$ ). Significant relationships also existed for men and women suffering from anorexia nervosa or bulimia nervosa and inappropriate weight loss practices (see Table 3). These relationships remained significant after we controlled for demographic variables. Also, women who self-identified as suffering from anorexia nervosa were significantly more likely to have an inaccurate perception of body weight than were those who did not report anorexia nervosa (OR = 1.43; 95% CI = 1.16–1.77;  $p = .001$ ). This relationship, however, abated after controlling for demographic variables. No relationship existed among men regarding anorexia nervosa and body weight perception. Last, women who self-identified as having bulimia nervosa were significantly more likely to have inaccurate body weight perception than were those with accurate perception (OR = 1.78; CI = 1.45–2.11;  $p < .001$ ), a relationship that abated after controlling for demographic variables. No relationship existed for men.

### COMMENT

In this study, nearly half of respondents reported attempting to lose weight; less than one-third, however, were overweight or obese on the basis of BMI derived from self-reported height and weight. Also, more women than men were attempting to lose weight, although men were more often overweight or obese. These results are similar to Behavioral Risk Factor Surveillance System (BRFSS) data from 2000, which showed that nearly half of all women in the United States were dieting to lose weight, whereas one-third of men were doing so.<sup>29</sup> In addition, men generally had a higher BMI than did women.<sup>29</sup> Importantly, other national data have shown that 58% of high school girls have dieted or are currently are dieting.<sup>30</sup> Thus, a trend of life-long concern with body weight is evident among females.

In our sample, weight loss was important to participants, but only 37.7% of all respondents followed standard weight

management guidelines, which include the combination of diet and exercise. These data are strongly reflective of earlier analyses representative of undergraduate students in the United States.<sup>12</sup> BRFSS data from the general adult population reflect an identical situation in adults: 19% of women and 22% of men used the combined strategy of diet and exercise for weight loss.<sup>29</sup> The lack of attention to weight management guidelines is not surprising, however, as only 3% of Americans generally follow combined health advice (including weight management, consistent physical activity, healthy dietary choices, and avoidance of tobacco).<sup>31</sup>

The college campus provides increased responsibility for personal choices, and it also contains numerous mechanisms for distribution of health information. Thus, as students form patterns of behavior that can persist into adulthood, college health professionals should focus on providing programs that emphasize combined physical activity and healthy eating for weight management.

Research shows that weight loss behaviors can be associated with distorted body weight perception, emotions, and self-esteem issues among college-aged women and men.<sup>32–34</sup> Ackard et al<sup>32</sup> showed that dieting frequency was related to body dissatisfaction and body size perception, as well as eating disorder symptoms in women. Mangweth and colleagues,<sup>34</sup> in studying a small sample of men with eating disorders, concluded that body weight perception could play an important role in continued disordered eating. In our sample, men and women who suffered from distorted body image were more likely to participate in inappropriate weight loss strategies than were those with accurate body image perception. Likewise, men and women suffering from anorexia nervosa or bulimia nervosa were much more likely to be involved in unhealthy weight loss practices. Thus, although the magnitude of the problem of distorted body weight perception tends to occur more frequently in women, the problem exists in both sexes, necessitating interventions inclusive of men and women.

Importantly, other data document that exercise behavior may be associated with increased depression and anxiety related to self-esteem among women with higher levels of eating disorder symptoms.<sup>35</sup> In other words, women suffering

from negative affect might participate in exercise and other weight-loss methods as a negative adaptive behavior related to self-esteem and body image, rather than a positive behavior for maintenance of health and fitness.<sup>35</sup> In our sample, women were much more likely to suffer from distorted body image, be interested in weight loss, and participate in all weight-loss strategies, including exercise, than were men. Because a relationship exists between body image distortion and body image dissatisfaction,<sup>18</sup> college administrators should emphasize the need to address body image issues in women and men as a potential underlying cause of unhealthy weight loss practices and eating disorders.

Likewise, health educators on college campuses should address exercise as an appropriate behavior for maintenance of health rather than a practice that may support unhealthy self-perceptions. In other words, messages and programs designed to promote physical activity and healthy eating should be framed in a way that activates a good health rather than a look good heuristic. The net result would be the promotion of 2 critically important health behaviors without iatrogenic psychosocial effects. For example, in battling body image issues, O'Dea and Abraham<sup>35</sup> found success in focusing primarily on self-esteem, a factor directly related to body image issues, in an adolescent population. In the college setting, Springer and colleagues<sup>36</sup> developed and provided an undergraduate body image course that focused on media images, the beauty ideal, eating disorders, and obesity, among other issues. Twenty-four undergraduates met for 2 hours each week for 10 weeks, and pre- to posttest comparisons showed a significant decrease in body dissatisfaction and disordered eating.<sup>36</sup> These successful strategies provide a framework in which to develop useful weight-loss and body-image-related education initiatives.

Limitations of this research should be noted. Most important, generalizability of data is limited because of self-selection of the universities included in the sample. However, students who participated in this research were randomly selected, and overall results of these analyses were not dissimilar to previously gathered, nationally representative data.<sup>12</sup> Because of the overrepresentation of women, extrapolation to the general population is further limited. Also, we included use of diet pills as an inappropriate weight loss strategy. The possibility exists, however, that some participants who noted use of diet pills might have been taking prescription medications for weight loss. The survey items addressing this topic were not specific enough to differentiate among types of diet pills. Likewise, diet and exercise in combination can be abused and become an unhealthy or inappropriate weight loss practice. Survey questions provided data only on involvement in activities and could not be used to assess healthy application of the activities. Another limitation is that all data were self-reported; thus, the potential exists for erroneous or false responses to items used in analyses. Last, use of BMI is limited because it fails to account for body composition or frame; thus, BMI values around the overweight category might reflect only greater muscle mass, for example.

Strengths of this study are that we incorporated a large sample size and used strategies to minimize error that might have existed. Also, a panel of health experts carefully developed the NCHA assessment tool, which was extensively validated.<sup>24</sup> Last, although universities self-selected for involvement in the study, a substantial proportion of the universities used a random selection method. The participants involved were nationally dispersed and appear to be comparable to other nationwide samples.<sup>12,26</sup>

Taken together, these data highlight the complex relationship between body weight perception and typically healthy behaviors, such as dieting and exercise. There remains a need to focus on body image issues related to weight loss practices in men and women. Formal education on body image and weight issues has been successful in the past, but the research on well-designed interventions is scarce. Further research is needed to elucidate complimentary intervention methods that promote weight loss behaviors without promoting body image issues. Also, incorporation and consideration of determinants of diet and exercise behaviors in interventions is necessary. Developing theory-based interventions may be useful in targeting promoters of healthy weight loss activities—such as improved knowledge, self-efficacy, and social support—with maintenance of accurate body weight perception. On the basis of these data and in consideration of other factors related to diet and exercise, we encourage practitioners to carefully design programs that emphasize health instead of appearance.

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#### NOTE

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