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Differences in Health-Related Behaviors and Body Mass Index Risk Categories in African American Women in College

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Abstract

Objective—To determine if differences in health-related behaviors (diet and physical activity) exist in African American college women based on body mass index (BMI) risk categories.

Methods—One hundred eighty-six African American women (age, 19.5 ± 2.5 y) in college were surveyed using the modified National College Health Risk Behavior Survey. Data regarding demographics, weight loss history/methods, food choices, and physical activity frequency were compared for obese (BMI ≥30, n = 30), overweight (25 ≤ BMI < 30, n = 45), and normal-weight (BMI <25, n = 111) groups. Data were analyzed using multiple 2-way analyses of variance.

Results—No differences in food choices were determined between the groups. The overweight and obese groups were more likely than the normal-weight group to have used healthy modalities such as diet and/or exercise to try to lose weight instead of unhealthy methods such as laxatives and diet pills. The overweight group reported more vigorous aerobic training and strength training workouts than the normal-weight group.

Conclusions—Food selection and activity frequency are not enough to differentiate African American women in different BMI categories. Other factors may contribute to obesity such as food portion sizes, genetics, and/or intensity of physical activities.

Keywords

obesity; body weight; African Americans; women's health; exercise; health behaviors

INTRODUCTION

Obesity is a major health concern in the United States, and major disparities in the incidence of obesity and obesity-related diseases exist between African Americans and other Americans.[1–9] African American women specifically have higher obesity rates than any other group, although it has been reported that African American women are more satisfied with their bodies and less likely to diet.[7,10–13] Also, the Centers for Disease Control and Prevention (CDC) has identified colleges and universities as a key location to maximize the effects of health information delivery due to the large number of young adults attending college.[1,14] Lifelong behaviors are formed during the transition period between dependent and independent living, which occurs in the college years, and this should be the time to focus on creating healthy habits and eliminating unhealthy ones.[2,3,6,15–17] Specifically in the

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early college years, students experience the sharpest decline in physical activity in their lives.[18–20] Weight gained during these years is unlikely to be lost easily.[2,21] Understanding behavior differences in those who are obese, overweight, and normal weight would be valuable in targeting the most significant contributors to overweight and obesity.[2,3,17]

Gary et al found correlates to being overweight in African American women were: marital status, parental status, socioeconomic status, weight loss attempts, personal and family history, and health status.[3] These researchers used the same measurement tool as the current study, and the fact that nutritional intake and activity levels were not reported (as significant or nonsignificant) may be valuable in supporting the results of the current study. Still, the comparison of Gary and colleagues was directed at the overweight and the nonoverweight and not at the 3 groups (obese, overweight, normal weight).[3]

METHODS

Purpose

The purpose of this study was to compare health characteristics and behaviors of African American students who were obese, overweight, or normal weight. Behaviors compared were food selection patterns (ie, number of fruit or vegetable selections made in a day), recent dieting history (ie, whether one tried to lose weight by exercising more or using laxatives), sports/ physical education participation, and physical activity levels (ie, number of strength training workouts performed in a week).

Participants

Participants were 197 African American (African American) women (mean age, 19.9 ± 2.5 y) who were currently enrolled in a southern, historically black college/university (HBCU). A true random sampling was not done; however, students were approached in a general education course required by all students. It can be assumed that the composition of class is similar in makeup to that of the university population. All participants completed an informed consent form approved by the North Carolina A&T State University's institutional review board prior to participation in the study.

Procedures

The Centers for Disease Control published the Youth Risk Behavior Survey for high school students and the modified National College Health Risk Behavior Survey (NCHRBS) for college students.[1] The current analysis used 55 of the original 97 questions from the NCHRBS. Questions on drug use, violent behavior, personal safety, and sexual activity were outside of the scope of this analysis and were removed. This also produced a shorter, easier-to-administer survey that had a decreased potential to illicit negative emotional responses from participants. The entire 55-item questionnaire was administered in a classroom setting within a period of 30 minutes. No identifying marks were made on the questionnaires, and responses were kept confidential and anonymous. To increase testing reliability, all tests were administered by the same researcher. In addition, the entire questionnaire was administered in the same session, and detailed instructions preceded all measures.

Statistical Analyses

Of the 197 women surveyed, 186 produced viable data and were include in this analysis. Four women did not identify as African American, and 7 women did not provide enough data to calculate the body mass index (BMI). After collecting the completed surveys, participants were categorized into groups based on BMI scores calculated from self-reported height and weight. This method was used by previous researchers to assess BMI.[1,3,6,14,22,23,25] Those with BMI of 30 or more were placed into the obese group (n =

30). Those with BMI scores under 30 and equal to or greater than 25 were placed into the overweight group (n = 45), and those with scores under 25 were assigned to the normal-weight group (n = 111). Data were analyzed using a 2-way analysis of variance with an α level set at .05. Statistical software was Predictive Analytics Software (PASW) Statistical Package 17.0 (release 17.0.2, March 11, 2009). Percentages were calculated based on the total number of valid responses for that factor. Missing values were deleted casewise.

RESULTS

All 3 groups were found to be similar in regards to height, age, years in school, enrollment status (full vs part time), housing status (off- vs on campus), marital status, hours worked per week, and insurance coverage, and considered homogenous ($P > 0.05$). The obese group described themselves as “slightly overweight” or “very overweight” more than the overweight and normal-weight groups ($P < 0.001$), and the overweight group described themselves as “slightly overweight” or “very overweight” more than the normal-weight group ($P < 0.001$) (Table 1).

Of the entire sample, 63.4% had tried 1 or more methods to lose weight in the last month. For all groups, no fewer than half of the women had attempted at least 1 weight-loss strategy in the last month (51%, 82%, and 73%, respectively). The overweight and obese groups were significantly more likely to try losing weight by dieting and exercising ($P < 0.05$) than the normal-weight group. Meanwhile, the normal-weight group reported more attempts at weight loss by way of bulimic methods (vomiting or laxatives) or diet pills, although the differences were not statistically significant ($P = 0.10$).

Self-reported food choices were based on the 24-hour period preceding the questionnaire (Table 2). These choices included frequency of selection of healthy foods (fruit, fruit juice, green salad, cooked vegetables) and unhealthy foods (hamburgers, hot dogs, sausage, French fries, potato chips, cookies, doughnuts, pies, and cakes). No significant differences were shown among the 3 groups on measures of food selection ($P > 0.05$). However, the overweight group actually had the most frequent selections of all the healthy foods (fruit, fruit juice, green salad, cooked vegetables) and least frequent selections of hamburgers/hot dogs/sausages. The obese group reported the lowest number of French fries, potato chips, cookies, doughnuts, pies, and cakes selected, while the normal-weight group reported the highest number for the given time period.

Activity behaviors were self-reported for the last week and included vigorous aerobic, moderate aerobic, stretching, strength-training sessions, participation in physical education classes, and college sports team participation. The overweight group reported significantly higher numbers of vigorous aerobic sessions and strength-training workouts than the normal-weight group. No other differences in activity behaviors were statistically significant, although the overweight group performed the highest number of flexibility training sessions.

DISCUSSION

The current data demonstrate that the behavior of those in the normal weight, overweight, and obese groups may not follow assumptions associated with being overweight/obese and especially with being African American, female, and overweight/obese. The overweight group would be assumed to be in better health than the obese group, but neither the overweight nor the obese groups would be assumed to be as healthy or engage in a greater number of healthy behaviors as the normal-weight group. One may expect the obese group to be the least active, to select the lowest number of healthy foods, and to select the highest

number of unhealthy foods as has been previously reported.[12] Postulations might be made that those in this group are least aware or informed of their overweight or obese status, are least likely to be trying to lose weight, or are more likely to use drastic or unhealthy weight-loss strategies such as laxatives and diet pills.[27] Also, the negative stereotypes of African American women either not caring about their weight or being more satisfied with a higher weight may lead one to presume that the current data would show higher rates of obese than national statistics and no pattern of desire or attempts to lose weight.[13,27] None of these assumptions is consistent with the current study's findings.

The main findings of this study are that the overweight group reported more bouts of vigorous physical activity and more resistance training sessions than the normal-weight students, who performed the least number of every kind of physical activity. This coincides with Lowry et al's analysis of the 1995 NCHRBS that reported 59.8% of the polled female students who were trying to lose weight and were more likely than those not trying to lose weight to engage in physical activity.[14] The overweight and obese groups were more likely to be trying to lose weight and more likely to use healthy weight loss strategies such as diet and exercise than the normal-weight group, who used more unhealthy bulimic methods to try to lose weight. Another key discovery is the lack of significantly different healthy and unhealthy food selections among normal-weight, overweight, and obese students. This is in agreement with other studies that found no associations among activity level, food selection, and/or BMI in African American women.[5,9,25–26]

Calorie Count and Composition

Calories were not counted in this analysis, only the incidence of eating certain foods that may correlate strongly with good health and bad health. Portion sizes and calorie content may have varied greatly between groups and may account for the differences in overweight and obesity. For example, a Quesadilla Explosion Salad at Chili's Restaurants contains 1400 calories and 88 g of fat (26 g saturated fat), while a Premium Southwest Fried Chicken Salad from McDonald's contains only 430 calories and 20 g of fat (4 g saturated fat).[28,29] Both of these selections would count in this survey as 1 salad even though there is a difference of nearly a day's worth of calories between them.

Exercise Intensity and Volume

Total work performed or *energy expenditure* (the product of exercise volume and intensity) was not measured in this particular analysis. For the aerobic exercises, the instructions asked for continuous bouts of vigorous or moderate intensities; however, total duration (giving total calories expended) was not recorded. Potentially, the obese and overweight groups may perform their physical activities at lower intensities than the normal-weight group, and this may account for the differences in overweight/obese status. The use of a time-based pedometer that could measure step rate as well as total work performed by the wearer could help identify or eliminate this confounding variable. Additionally, participants could report for supervised exercise sessions where intensity could be measured or estimated more precisely.

Exercise intensity also was not measured in this analysis. *Vigorous cardiovascular training sessions* (defined as activities that cause one to sweat for 20 minutes or more), resistance and flexibility training sessions, and *moderate cardiovascular sessions* (defined as repetitive activities such as biking or walking for 30 minutes or more) did not have specific rate-based definitions. Walking session speed could vary between individuals where one individual could have reported a 1.5 miles-per-hour walk across campus, where another may not have thought of this activity as strenuous enough or long enough to be reported. Again, supervised workouts may help correct for this type of error; however, this may cause

increased exercise sessions by all participants due to the increased attention from the researchers to the participants. Also, clear definitions and instructions by the researchers before administering the questionnaire may help minimize the risk of false over- or underreporting of activity.

The Healthy College Student and Behavior Patterns

Just as a common confounder in public health studies is the "healthy worker effect," the current study may have been biased by the "healthy college student effect," where this sample represents a healthier slice of the true population. Socioeconomic status was not collected but the university's demographics show mixed backgrounds for students attending classes. Again, since this survey was administered in a general education course, it is safe to assume that the students in the class are representative of the student body. Future studies might include African American women from a variety of postsecondary institutions, including majority universities, public and private colleges, community colleges, and technical training centers. Also, BMI differences have been associated with housing status or "neighborhood context;" however, there were no significant differences in BMI between students living in on-campus and off-campus housing[7] ($P = .80$). Nonetheless, there may be differences within the group of students living in off-campus housing based on neighborhood characteristics, which were not measured in this study.

Clinical Measures

Clinical measurements such as basal metabolic rate (BMR), epigenetics, or psychosocial measures were not examined in this analysis and compared to the survey responses. Other studies are currently underway to identify genetic markers to predict responsiveness to exercise stimuli. BMR or epigenetics alone could be responsible for differences in obesity status, with no major differences in type of food selection, activity frequency, or demographic information.

CONCLUSIONS

According to these data, no dietary differences exist among normal weight, overweight, and obese college women of African American descent, which is not in agreement with others.[23] The overweight and obese groups were more likely to be trying to lose weight and also more likely to be trying to lose weight in a healthier manner than the normal-weight group. In addition to helping individuals understand their own behavior, these data should be useful to health professionals, exercise leaders, and health behaviorists who may hold misconceptions or inaccurate generalizations about African American patients or clients with overweight or obesity. These professionals should acknowledge that obesity cannot be explained simply by food selection, activity frequency, and a lack of awareness of one's obesity or BMI classification. A personal trainer or health professional may immediately disregard the client with obesity and address "diet" with her before assessing physical status or food intake composition, which may undermine the client's true goal of maintaining or improving health and place greater focus on appearance and others' attitudes towards one's body. The deficit in proper knowledge of exercise prescription and health outcomes is not limited to a few uneducated personal trainers; however, it runs all through the health care community from "fitness experts" all the way up to the physicians.[30]

The current findings bring up significant questions as to the cause of obesity in African American women. Future studies should use more sensitive measurement devices in order to determine portion sizes, nutritional density, and average daily intake, and may use more objective reporting methods for food intake such as daily food logs or supervised meals. Also, future studies may follow-up with a training study in order to standardize activity

levels for all participants. This will eliminate any errors due to inaccurate reporting of physical activity and will draw out any differences in the participants' responsiveness to exercise. The significance of these findings leads professionals to find better methods of assessing obesity-related behaviors beyond traditional questionnaires and self-reported physical activity analysis.

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Table 1

Participant Characteristics, Mean ± SD)

	Normal Weight	Overweight	Obese	Total (All Groups)
Number, n	111	45	30	186
Age, y	19.8 ± 2.2	20.0 ± 2.5	19.9 ± 3.3	19.9 ± 2.5
Height, m	1.64 ± 0.07	1.62 ± 0.07	1.64 ± 0.08	1.64 ± 0.07
Body mass index, kg/m/m	21.8 ± 1.8[a]	27.2 ± 1.4[a]	35.2 ± 5.4[a]	25.3 ± 5.6
Freshman/sophomore, % in lower division	59	62	73	62
Enrollment status, % full-time	99	98	100	99
Marital status, % single	98	100	97	98
Housing status, % on campus	59	56	60	59
Hours worked, % >20 hrs/week	23	29	43	25
Health care coverage, % insured	83	89	83	84

[a]Statistically significant, $P < .05$.

Table 2

Healthy Behaviors (Mean ± SD)

	Normal Weight	Overweight	Obese	Total (All)
Fruit[a]	1.68 ± 0.9	1.87 ± 1.1	1.69 ± 1.0	1.73 ± 1.0
Fruit Juice[a]	2.50 ± 1.1	2.56 ± 1.1	2.47 ± 1.2	2.51 ± 1.1
Green salad[a]	1.45 ± 0.7	1.64 ± 0.8	1.50 ± 0.6	1.51 ± 0.7
Cooked vegetables[a]	1.69 ± 0.8	1.91 ± 0.9	1.77 ± 0.9	1.76 ± 0.9
Hamburgers, hot dogs, or sausage[a]	1.51 ± 0.8	1.40 ± 0.7	1.60 ± 0.8	1.50 ± 0.8
French fries or potato chips[a]	1.77 ± 0.8	1.76 ± 0.8	1.73 ± 0.7	1.76 ± 0.8
Cookies, doughnuts, pie, or cake[a]	1.64 ± 0.9	1.56 ± 0.7	1.47 ± .07	1.59 ± 0.8
Vigorous cardiovascular activities[b]	2.58 ± 1.8[d]	3.29 ± 1.7[d]	2.93 ± 2.0	2.81 ± 1.8
Flexibility training (stretching)[b]	2.74 ± 1.9	3.02 ± 1.8	2.73 ± 2.1	2.81 ± 1.9
Resistance training (weight training)[b]	2.17 ± 1.6[d]	2.84 ± 2.0[d]	2.10 ± 1.5	2.32 ± 1.7
Moderate cardiovascular activities[b]	3.13 ± 2.5	3.47 ± 2.4	3.83 ± 2.6	3.32 ± 2.5
Physical education activity class[b]	1.45 ± 0.5	1.47 ± 0.5	1.53 ± 0.5	1.46 ± 0.5
College sports team[c]	1.17 ± 0.4	1.11 ± 0.4	1.14 ± 0.4	1.14 ± 0.4

[a] No. of selections in last 24-hour period.

[b] No. of sessions in last 7-day period.

[c] No. of sports (intra- or extramural) in past year.

[d] Statistically significant difference ($P < .05$).