

The prevalence of obesity among students at an African American university in the south¹

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Abstract

The increasing rate of obesity among children and young adults has become a major health concern in the United States. This is especially prevalent in the southern states and among African Americans. The purpose of the study was to investigate the prevalence of overweight and obesity among African American students (N=265) at a Historically Black University in the South. Body Fat Percentage (BFP), Body Mass Index (BMI), and Waist to Hip Ratio (WHR) were measured to determine weight categories. The results showed that 32.1% fell within the BFP category for obese and 43.4% in the BMI category ranges of overweight to obese. Females showed significantly higher BFP than males. University class standing indicated higher BFP among sophomores and seniors and higher BMI among sophomores and juniors. WHR findings were insignificant. The study concludes with implications that may be applicable for Historically Black Universities and Colleges.

¹Funding was provided by Prudence Pollard, PhD and the Oakwood University Faculty Development Research Office.

Introduction

The prevalence of obesity in the United States has more than doubled in the past three decades, with certain racial and ethnic groups being more disproportionately affected (Wang & Beydoun, 2007; Ogden, M, Curtin, McDowell, & Tabak, 2006). Data from the 2003-2004 National Health and Nutrition Examination Survey (NHANES), for which height and weight of adults aged ≥ 20 years are measured by survey staff members, indicated the prevalence of obesity was 45.0% among non-Hispanic Blacks, 36.8% among Mexican-Americans, and 30.6% among non-Hispanic Whites (World Health Organization, 2008). This report found smaller prevalence, using height and weight data that were self-reported to the Behavioral Risk Factor Surveillance System (Center for Disease Control and Prevention, 2013) and, therefore, likely to produce underestimates (Ogden, M, Curtin, McDowell, & Tabak, 2006). However, differences among non-Hispanic Blacks, non-Hispanic Whites, and Hispanics in this report were similar to those found in the NHANES study: non-Hispanic Blacks had the greatest prevalence of obesity, followed by Hispanics and non-Hispanic Whites.

According to the World Health Organization (WHO), obesity is now a worldwide epidemic and if immediate action is not taken, millions will suffer from a variety of serious health disorders in the near future. Obesity predisposes individuals to serious diet-related diseases, including type 2 diabetes, cardiovascular disease, hypertension, stroke, and certain cancers (Lavie, Milani, & Ventura, 2009; Pi-Sunyer, 1990). The health consequences of obesity range from increased risk of premature death to individuals living longer but with serious chronic illnesses that result in poor quality of life (Gary, Gross, Browne, & LaVeist, 2006). The

Centers for Disease Control and Prevention (CDC) report that African Americans are affected more by type 2 diabetes. Recent statistics also show that the southern states rank as the most obese states in the nation, with Mississippi being first followed by Alabama. National averages indicate that approximately 30% of adults and 20% of children are obese (Centers for Disease Control and Prevention, 2012).

Over the last 40 years, Loma Linda University conducted several health studies widely known as the Adventist Health Study (AHS) on Seventh-day Adventists (SDA), a religious group of people known for their unique dietary and lifestyle habits (Loma Linda University AHS, 2013). The investigations also included an African American cohort - Adventist Health Study-2 (AHS-2) with 96,000 Black SDA participants, one of the largest ever conducted. Results indicated that compared to non-Black SDA participants, Blacks had *more* cases of type 2 diabetes, stroke and high blood pressure, but *fewer* cases of emphysema, myocardial infarction, fibromyalgia and high cholesterol. Obesity was also more prevalent among the Black SDAs than non-Blacks (35% vs. 22%). However, their dietary and lifestyle habits resulted in a lower risk, than other Americans for heart disease, several cancers, high blood pressure, arthritis, and diabetes (Loma Linda University AHS-2, 2013). Based on these numbers, it is evident that compared to other Blacks nationwide, the prevalence of obesity among SDA Blacks in the AHS-2 population is 10% lower than that indicated among Blacks in NHANES.

In 2009, one of the first comparative studies was conducted on college students in the southern United States. The study compared the prevalence of overweight and obese students at a Historically Black College or University (HBCU) and a predominantly Caucasian university, both of which are affiliated with the SDA religious group (Pawlak & Sovyanhadi, 2009). Findings indicated that obesity-related measurements were significantly higher in African American university students than their Caucasian counterparts (Pawlak & Sovyanhadi, 2009). The present study investigated the anthropometric measurements of obesity among students at the same HBCU in the South. This was expected to provide insight into the prevalence of overweight and obesity after three years had elapsed. The authors also believed that BMI alone may not always be reliable in determining obesity if someone had increased muscle mass versus body fat. Therefore, this study looked comprehensively at obesity by measuring BFP, BMI, and WHR. The results provided confirmation that young adult students at this university continued to be affected by the growing epidemic and that it had, in fact, worsened.

The potential physiological consequences of obesity in children and young adults including diabetes, hypertension, cardiac risk factors and sleep apnea are well-documented (Lawrence, 2010). Novaki, Ahlgren and Hammarstrom (2005) suggested that social inequalities in individuals who are overweight may oftentimes be a reflection of the added influence of several adverse circumstances that are experienced from adolescence through young adulthood. They further suggested that underlying reasons for social inequality in the overweight often differs between men and women and that policy implications should be undertaken to reduce these. (Healthy people.gov, 2011). They believed that “the consequences of childhood overweight and obesity are systemic, affecting children, families, communities, and the public” (Novaki, Ahlgren, & Hammarstrom, 2005, p. 195). Trotter, Bowen and Beresford (2010) also found that many health disparities, such as increased prevalence of chronic illnesses found in adulthood, may be rooted in childhood.

In 2010, Kahng investigated whether racial disparity in health between Black and White Americans can be attributed to racial disparities in body weight and socioeconomic status (Kahng, 2010). He found that Black

Americans presented with a significantly more negative chronic health condition (CHC) trajectory than did their White counterparts, confirming racial disparity in health over time. He also stated that racial disparity in CHC trajectory can be explained by racial disparity in BMI and that racial disparity in BMI can be attributed to racial disparity in social economic status (SES). Because low SES is closely related to unhealthy diet and negative health behaviors that may subsequently lead to **obesity** and chronic health conditions, his findings suggested that to address racial disparity in CHCs, it is important for social workers to continuously try to mitigate racial inequality in SES (Kahng, 2010).

Many southern traditions, lifestyles and eating habits may also contribute to increases in overweight and obesity rates. Many traditional methods of cooking such as deep-frying, or adding gravy are in conflict with heart-healthy recommendations to reduce fat and sodium intake. Many African American traditions also revolve around food. The popular term for African American cooking is “soul-food.” Staples of soul food include fried chicken, fried pork chops, cornbread, and ribs. Many of these dishes use large amounts of fat and salt for flavor (Epstein, 2001).

In 2003, Bronner and Gary conducted a study on the campus of Morgan State University, an HBCU, and found that “the exploration of factors that may contribute to obesity and weight gain over time will help to develop interventions to reduce the excess burden of chronic disease in African Americans” (Johns Hopkins School of Public Health, 2011). They further concluded that it is crucial to examine weight-related factors in African Americans early in life in order to prevent chronic disease that may develop in the middle years. In a similar study, LaFountaine et al. (2006) found that by focusing attention on wellness behaviors of college students, health and education professionals can develop programs and activities to enhance wellness for these students which could impact their success in college and assist in the development of healthy behaviors that can be sustained over their lifetime.

In keeping with the U.S. Department of Health and Human Services’ *Healthy People 2020* and *Healthy Campus 2020* (Healthy people.gov, 2011), 10-year agendas for improving the nation’s health, the authors believe that the results of this study will have significance for not only increasing the body of knowledge that currently exists but can be used as a comparison to the previous study that measured the same population group three years earlier. The study also provides a platform for designing a model intervention that can be extrapolated to other HBCUs across the nation. This could help to reduce health disparities among African American students attending HBCUs and make a significant impact in contributing to the achievement of the objectives of *Healthy People 2020* and *Healthy Campus 2020* (Healthy people.gov, 2011).

Method

A cross-sectional quantitative design was conducted from February 2012 through August 2012. Anthropometric measurements of BFP, BMI, and WHR were conducted on a purposive sample of 265 informed and consenting full-time students that were in at least the second semester of their freshman year. Materials used for testing consisted of skin fold calipers to measure BFP, digital scales with meter rulers to measure BMI, and tape measures to measure WHR.

After acquiring approval from the Institutional Review Board (IRB) of the university, fitness laboratory and classroom measurements were conducted on the participants. To maintain reliability among the researchers, a training seminar on the measurements was conducted by a fitness expert. Measurements were recorded on an anonymous data sheet. These measurements were entered into the universal formulae and tables used to calculate BFP, BMI, and WHR. Gender and class standing of participants were also recorded. The data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 18. An analysis of covariance was performed with gender and university class standing to obtain significant indicators related to the prevalence of obesity in these sub-groups.

Results and Discussion

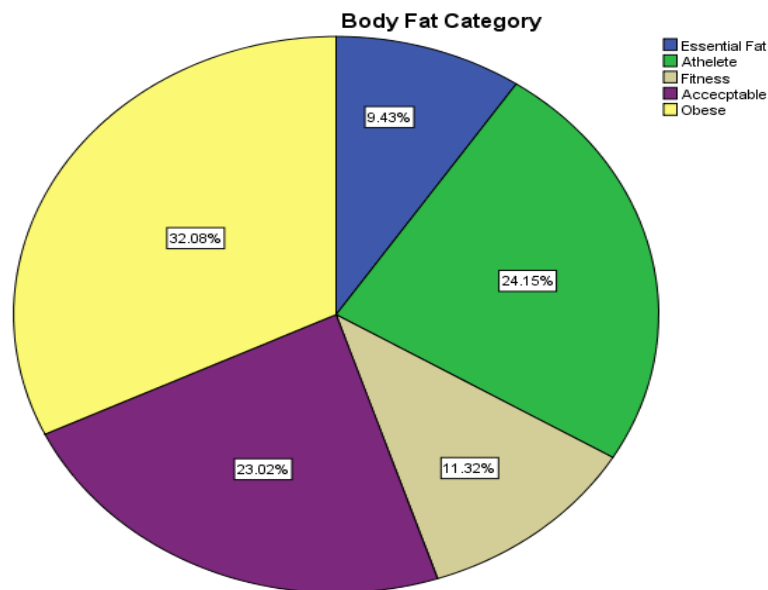
A total of 265 Black college students participated in the study ($n=265$). Participant ages ranged from 18 to 26 years with mean [SD] age = 21.34 which was 23.77% of the total population. Included in the analysis were 128 males (48.3%) and 137 females (51.7%). A detailed description of participants is found in Table 1.

Table 1: University Class Standing

College Year	n	%
Freshman	52	19.6
Sophomore	72	27.2
Junior	81	30.6
Senior	60	22.6

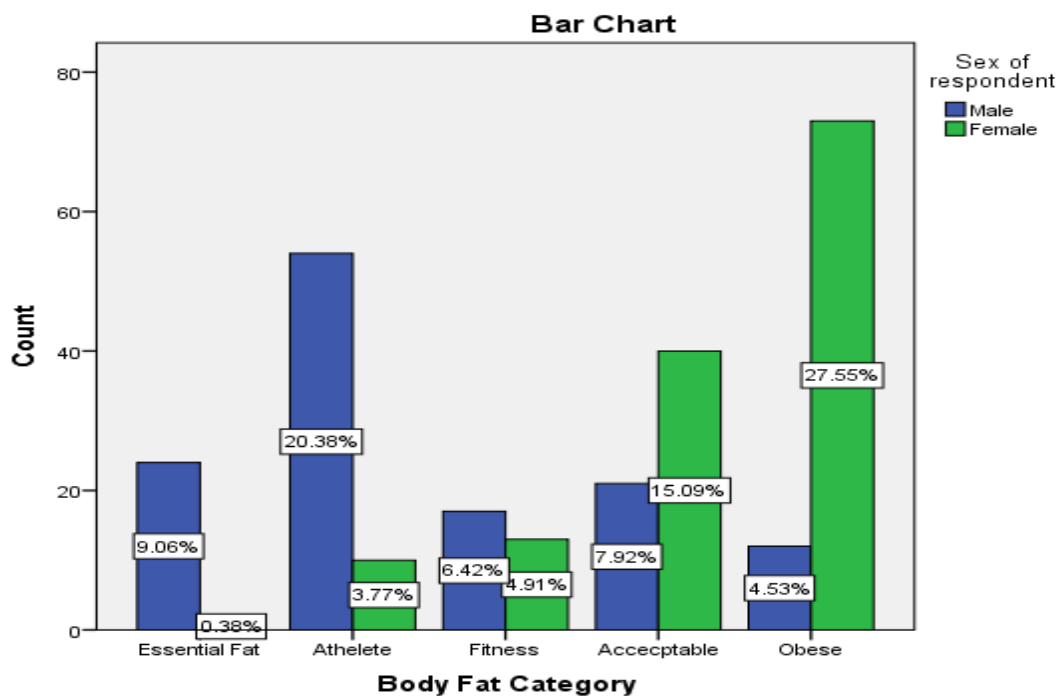
Body fat percentages indicated that 32.08% of the total population fell within the category of obese. (See Pie Chart 1)

Pie Chart 1: Body Fat Percentages



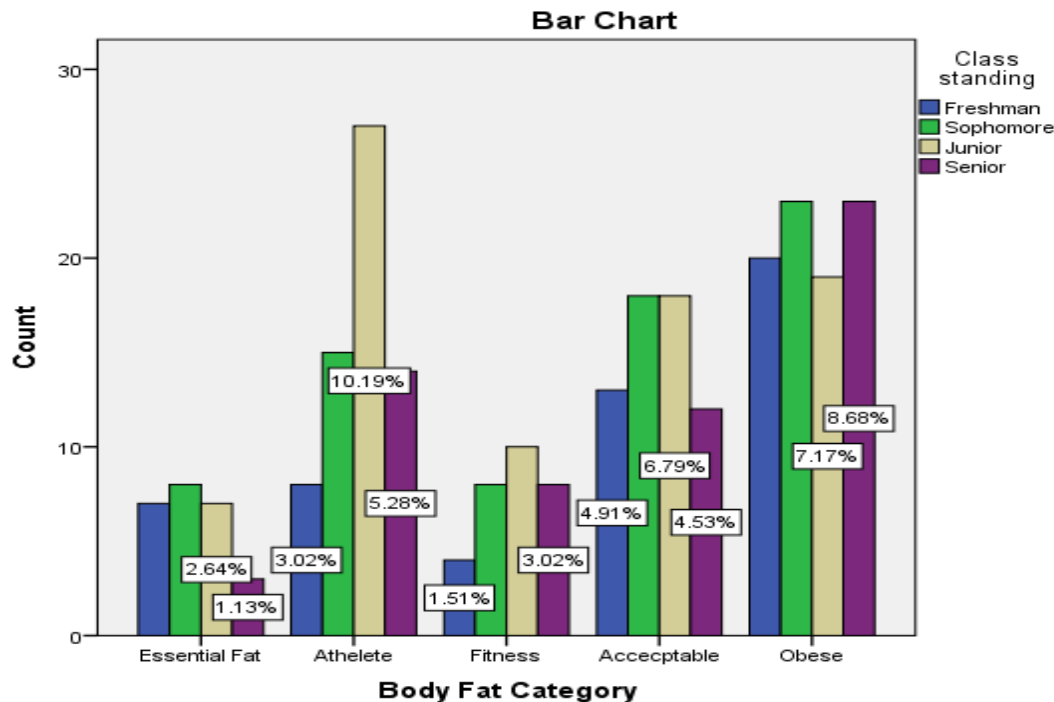
Females demonstrated a significantly higher tendency towards obesity than males (27.55% females and 4.55% males) (See Bar Chart 1)

Bar Chart 1: Body Fat Percentages by Gender



Sophomores and seniors showed the highest tendency towards obesity. (See Bar Chart 2).

Bar Chart 2: Body Fat Percentages by Class Standing



For BMI, most students were within the normal healthy weight range (54.7%, BMI = 18.5 to 25), 1.9% were underweight (BMI = 16 to 18.5), 26.8% were overweight (BMI= 25 to 30), 9.8% were moderately obese (BMI = 30 to 35), 3.0% were severely obese (BMI = 35 to 40), and 3.8% were very severely obese (BMI over 40). More male college students ranged from overweight to severely obese than female college students, 60 versus 56 of the total population. When students were ranked by class standing, those who were classified as overweight to very severely obese, 23 were freshmen, 31 were sophomores, 34 were juniors, and 27 were seniors. WHR results indicated that the college males had a lower moderate to high risk for obesity (22) than females (29) in the total population. The class standing showed that freshmen (14) and juniors (16) were highest in WHR of the total population. Conversely, sophomores (63) and juniors (65) showed a low risk towards obesity.

Pawlak and Sovyanhadi (2009) found that for BMI categories, the students were >30% overweight or obese (21% overweight and 10% obese). Furthermore, the survey showed a 35.8% dominance of overweight and obesity in African American students and 18.9% among Caucasian students (Pawlak & Sovyanhadi, 2009). The present study that was conducted on students at the same HBCU in the South mirrored these results with an increase in the frequency of overweight and obesity of >45% (27% overweight and 17% obese). In fact, a comparison of the data indicated the BMI levels among both male and female student populations were significantly higher in the 2012 study. In addition, the female population superseded the male population in the 2012 study in terms of obesity levels. Several other health studies on college students (29-31) have documented that both male and female African American students showed higher rates of overweight and obesity relative to

other racial/ethnic groups. While the National College Health Assessment (NCHA) data suggest that one in 10 college students is obese (American College Health Association National College Health Assessment, 2008).

Given the positive results of the Black cohort in the AHS-2 (Loma Linda University AHS-2, 2013), when compared to the national averages, the present study examined the obesity profile of college aged SDA adolescents coming from the homes of parents that were among this Black cohort. The profile of these adolescents indicated an 8% obesity rate above that of their parents. The researchers posit a theory of conceptual framework, the objectification theory of attachment (Lapsley, Power & Josselson, 1988), which may account for the disparity among college students coming from homes of parents that participated in AHS-2. The increase in obesity among these adolescents may be due to the period of adolescent development when the child moves into adulthood and away from dependence on parents to an independent life. A portion of adolescents may detach from childhood by rebelling against parents in search of autonomy. Hence, their health and lifestyle practices may differ somewhat from that of parents, making the college years a critical period for intervention and reinforcement of healthy habits and lifestyle practices.

This may be the prime time to implement changes in order to avoid the health consequences in later years. Many students are living on their own for the first time when they enter college as freshmen; therefore, there is a need for dietary education and physical activity guidance to aid the student's health outcomes. For example, a nutrition education course with a "SNAAKS" (Student Nutrition Action, Attitude, Knowledge, and Skills - a theory-based intervention intended to address the nutrition and eating behaviors of Black and Hispanic college freshmen) type of curriculum should be required for freshmen as well as physical activity courses throughout every semester to substantiate the necessity of regular physical activity throughout one's entire life.

According to the National College Health Assessment (NCHA) Reference Group Report of 2007, college students are among the population subgroups that show inadequate physical activity levels (Krisberg, 2008). Across studies, approximately 50% of college students report insufficient activity based on current recommendations, with around 20% reporting no exercise (Keating, Guan, Pinero, & Bridges, 2005; American College Health Association National College Health Assessment, 2008). From a health promotion perspective, understanding physical activity-related behaviors of college students is important because physical activity levels decrease with age, with the sharpest decline occurring during adolescence and young adulthood (Gyursicsic, Bray, & Brittain, 2004). Evidence also suggests that activity habits established during college may continue into adulthood (Leenders, Sherman, & Ward, 2003). Besides age, physical activity behaviors are also influenced by sex and race. The prevalence of physical inactivity is higher for females and minorities compared to other subgroups. For example, in both student and adult populations, Blacks (especially females) show lower activity levels and a higher prevalence of obesity than Whites (Kimm, et al., 2002). Most of the research conducted on this topic has sampled White students, and most of the studies examining race differences on exercise correlates have focused on children or adults (Bopp, et al., 2006).

Physical inactivity can have a negative impact on health disparities among African Americans. According to Hasse, Stetoe, Sallis, and Wardle (2004), few behaviors have the potential to decrease the risk of many chronic illnesses as regular physical activity. They stated that "despite the well-established benefits of regular

physical activity, 70% of Americans do not meet the physical activity recommended levels” (Hasse, Steptoe, Sallis, & Wardle, 2004, p. 187). College students do not seem to be doing much better in terms of physical activity and obesity. A recent college student study conducted by Suminski, Petosa, Utter and Zhang (2007) found that the majority of college students were not engaged in any regular physical activity. A later review of the literature estimating college student physical activity levels found that there are few studies examining the physical activity of minority students (Keating, Guan, Pinero, & Bridges, 2005). This led us to infer that physical activity intervention programs that target minority college students could help to prevent or reduce negative health outcomes if healthy behaviors are established early in life.

According to Suminski et al., (2007) effective health promotion efforts focused on increasing activity, especially for individuals at risk for inactivity such as Black females, are important factors in understanding physical activity levels among distinct groups. They suggested that “understanding physical activity-related behavior is complex and that a variety of individual factors (e.g., motivation to exercise, enjoyment of exercise, time availability), social-cultural factors (e.g., social norms, culturally relevant social networks/support, and environmental factors (e.g., neighborhood safety, access to parks and recreation centers, availability of sidewalks) will influence activity levels.” Identifying exercise correlates of college students may facilitate the development of effective physical activity programs customized to the needs, interests, and demographics of specific populations (Suminski, Petosa, Utter, & Zhang, 2007).

University cafeterias and student markets should also support health initiatives by providing a wide variety of fresh fruits, vegetables, lean proteins and whole grains. The options in vending machines should also make adjustments by providing healthy alternatives to the typical mid-day snack. Early intervention programs of proper nutrition, regular physical activity, and behavioral modification programs are essential when students arrive in their freshman year of college. These essential basics of diet and exercise ought to be constantly repeated during the college experience to prepare the student for a healthy life.

The results of this study should be considered in respect to the main limitations in order to procure an objective analysis. Firstly, the sample group is a homogeneous group (African Americans) that attend a HBCU, thus the application is not applicable to a wide student population group. Secondly, the subjects were selected using a purposive sampling method. While stratified or probability sampling could have been used, it was determined that purposive sampling would be the best methodology for obtaining a larger pool of participants. Random sampling may have increased the likelihood of the study to be generalized to the students at-large.

Conclusion

This study was designed to investigate the obesity health status of African American students attending an HBCU in the southern United States. It provided important comparative BMI data to the study conducted in 2009 by Pawlak and Sovyanhadi. This can be used to demonstrate the progression of the obesity epidemic as a result of lack of curricular and co-curricular intervention. The study also provided critical insight concerning the health effectiveness of university curricula in which physical activity courses are not required in each semester with a captive audience of students who typically matriculate across four years and where health and wellness can be embedded in curricular and co-curricular learning and practice. The comparative results of the 2009 and 2012 studies show that despite the curricular requirement of random activity courses, student mean BFP and BMI levels continue to be an area of concern with both studies reporting higher than normal levels.

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