

PREVALENCE OF OVERWEIGHT AND OBESITY AMONG SEVENTH-DAY ADVENTIST AFRICAN AMERICAN AND CAUCASIAN COLLEGE STUDENTS

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All age, sex, and racial groups are affected by the obesity epidemic in the United States, although disparities exist among these groups. The Seventh-day Adventists are a religious group of people who are believed to live longer and healthier lives than do their non-Adventist counterparts because they do not smoke or drink alcohol and they eat a healthier diet. This study assessed the prevalence of overweight and obesity among Seventh-day Adventist college students attending 2 private universities in the southern United States. Most students' body mass index (65.8%) was within the normal weight category, 3.7% were underweight, 20.6% were overweight, and 9.9% were obese. Body mass index ≥ 25 kg/m² was more prevalent among men and African Americans. In all ethnic subgroups, the prevalence of overweight and obesity was lower than that among non-Adventist students reported in other studies. (*Ethn Dis.* 2009;19: 111-114)

Key Words: Obesity, Overweight, Adventists, College Students

INTRODUCTION

The increase in the rate of overweight and obesity in the United States in the last few decades has been observed in all age, sex, and racial groups.¹ Although the Healthy People 2010 objective for obesity prevalence has been set for 15%, data from the Centers for Disease Control and Prevention (CDC) show that in 2005 and 2006 more than 34% (≈ 72 million) of Americans aged ≥ 20 years were obese.^{1,2} In 1995, 1 in 5 college students was overweight,³ and since that time rates of overweight have increased.

Since about the mid-1800s the Seventh-day Adventist church has emphasized wholeness and health as a religious duty of every church member. Adventists are believed to live longer than do non-Adventists and are less at risk for some chronic health conditions. The health status of Adventists is attributed to their lifestyle, which includes abstinence from smoking and alcohol and low intake of meat. Approximately 40% of Adventists are either ovo-lacto vegetarians or vegans. Most data regarding health among Seventh-day Adventists come from either middle-aged or older adults. No data have been published on the rate of obesity among Seventh-day Adventist college students. The purpose of this cross-sectional study was to assess weight status according to the CDC body mass index (BMI) categories and examine prevalence of overweight/obesity by sex, racial/ethnic background, and diet (vegetarian vs. meat eaters) among Seventh-day Adventist college students at 2 private higher learning institutions.

No data have been published on the rate of obesity among Seventh-day Adventist college students.

METHODS

Data Collection

Before collecting data, we submitted our research protocol to the institutional review board at East Carolina University. Data were collected by a faculty member from each of the 2 institutions. So that our sample was representative of all majors, surveys were distributed in general education classes offered to all undergraduate students. Students were informed about the purpose of the study both verbally and in writing before surveys were distributed. Students were assured that their participation in the survey research was voluntary and that they would not be penalized if they refuse to participate. Students were also informed that by completing the surveys, they consented to research protocol and to dissemination of the results in professional journals. No compensation was offered for participation in the research project; however, some instructors offered extra credit toward the students' grades. All students present in the classroom during the time the survey was administered completed the survey. BMI was calculated from self-reported weight and height on the survey and grouped according to CDC categories: underweight (< 18.5 kg/m²), normal (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥ 30.0 kg/m²).

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Sample

Data analysis was based on 406 students from 2 Adventist universities: Oakwood University (n = 228, 56.2%) and Southern Adventist University (n=178, 43.8%). The 2 universities were purposefully selected because of the profile of the student populations. Oakwood University, a historically Black university, offers 47 undergraduate and graduate programs and has an annual enrollment of ≈1750 students from ≈40 US states and 30 other countries. Almost 90% of the students are out-of-state students. Approximately 94% of the students at Oakwood University are African Americans, and <3% are White. Southern Adventist University offers students 85 different undergraduate and graduate programs of study. It has an annual enrolment of ≈2500 students. Most students (76%) at Southern Adventist University are out-of-state students, representing all 50 US states, 4 US territories, and 30 other countries. Approximately 70% of students are White, and <10% are African American. Both universities are located in the southern United States in the Tennessee Valley at the foothills of the Appalachian Mountains. In order to be included in the analysis, participants had to be undergraduate students enrolled in classes during the spring 2008 semester.

Statistical Analysis

Descriptive analysis including mean, range, frequencies and percentages were calculated by using SPSS version 15.0 (SPSS, Inc, Cary, NC). Analyses of the mean differences between sex, ethnic background, and dietary preferences were assessed by 1-way analysis of variance. Tukey post hoc analysis was performed to determine significant differences between groups. We performed χ^2 analysis to determine whether the rates of overweight and obesity differed by sex, ethnicity, and diet preferences. Differences were considered significant at $P < .05$.

Table 1. Sociodemographic characteristics of 406 Seventh-day Adventist college students

Characteristics	n	%
Sex		
Male	158	39.1
Female	246	60.9
Missing data	2	.1
Ethnicity		
African American	237	58.4
White	122	30.0
Caribbean	32	7.9
Asian	13	3.2
Missing data	2	.5
College year		
Freshman	154	37.9
Sophomore	143	35.2
Junior	58	14.3
Senior	43	10.6
Other	3	.7
Missing data	5	1.2
Weight		
Underweight (BMI <18.5 kg/m ²)	14	3.7
Normal (BMI 18.5–24.9 kg/m ²)	252	65.8
Overweight (BMI 25.0–29.9 kg/m ²)	79	20.6
Obese (BMI ≥30 kg/m ²)	38	9.9
Missing data	23	6.0
Diet		
Eat all foods	13	3.2
Eat clean meats	214	52.7
Ovo-lacto vegetarian	94	23.2
Lacto vegetarian	31	7.6
Ovo vegetarian	24	5.9
Vegan	25	6.2
Missing data	5	1.2
Residence		
With parents	29	7.1
In resident hall/dorm	302	74.4
In a rental/own apartment/house	60	14.8
Other	2	.5
Missing data	13	3.2

BMI = body mass index.

Results

A total of 431 surveys were collected. Twenty-five of the collected surveys were excluded from analysis because students who completed them were not members of the Seventh-day Adventists church. Most of the participants (mean [SD] age = 20.29 [3.76]) included in the analysis were females (60.9%), African Americans (58.4%) and were between 18 and 25 (94.78%). Detailed description of participants is found in Table 1.

Most students' BMI (65.8%) was within the healthy weight range category,

3.7% were underweight, 20.6% were overweight and 9.9% were obese, after exclusion of missing data (n=23). Males had higher rate of overweight and obesity status (BMI ≥25) than females (34.0% vs 28.3%) and higher mean [SD] BMI (24.4 [4.48] vs 23.7 [4.87]). However, neither the difference in the rate of BMI ≥25 (chi-square=1.291 [df = 1]; P<.256) nor the difference between the mean weight (F = 0.232 [df = 1]; P<.630) between these two groups was statistically significant. Black students had higher rate of overweight or obesity (BMI ≥25)

Table 2. Prevalence of overweight/obesity (body mass index ≥ 25 kg/m²) by sex, ethnicity, and diet among 406 Seventh-day Adventist college students

Characteristic	Overweight/obese (%)	P value
Sex		
Male	34.0	.256
Female	28.3	
Ethnicity		
African American	35.8	<.001
White	18.9	
Diet		
Vegetarian	27.3	.205
Nonvegetarian	33.8	

compared to White students, 35.8% vs 18.9%. White students mean [SD] BMI of 22.5 [3.43] was statistically significantly different from Black's students mean [SD] BMI of 25 [5.19] ($F=11.17$ [df=1]; $P<.000$). Black students were more likely to be overweight or obese ($BMI \geq 25$) than White students (Likelihood ratio 15.97 [df=2], $P<.000$). The rate of $BMI \geq 25$ among Caribbean students was 25% and the mean (SD) BMI was 23.46. No statistically significant difference was observed in either the mean weight or the rate of the $BMI \geq 25$ between the Caribbean students and students from other ethnic groups.

Students who were vegetarians had lower rate of $BMI \geq 25$ and lower mean [SD] BMI compared to non-vegetarians (27.3% vs 33.8% and 23.6 [4.35] vs 24.2 [4.49], respectively). The difference in the rate of $BMI \geq 25$ between these two groups was not statistically significantly different (chi-square=1.61 [df=2]; $P<.205$). Also, the mean BMI between these two groups was not statistically

significant ($F=0.725$ [df=378]; $P<.249$). No statistically significant difference in the mean BMI was observed between students with different student status e.g. freshman vs. sophomore ($F=212$ [df=3], $P<.888$).

DISCUSSION

We found a prevalence of overweight and obesity among young adult Seventh-day Adventists of $>30\%$ (21% overweight and 10% obese). The higher prevalence of overweight and obesity in men is consistent with findings in non-Adventist students³⁻⁵ but is inconsistent with the higher prevalence in women among all US adults aged ≥ 20 years.¹

Consistent with reports from other studies, prevalence of overweight and obesity was higher among African American students. Studies with African American students from non-Adventist universities show the prevalence of overweight and obesity to be $\approx 50\%$. For example, data from the 1995 National College Health Risk Behavior Survey showed a 48.7% prevalence of overweight and obesity in African American students. The rate of overweight and obesity among White students (18.9%) in our study is substantially lower than the rate of 26.5% reported in another study.⁶ In that study, Whites made up $>90\%$ of the sample.

We found no difference in BMI between vegetarian and nonvegetarian students. Such a difference was found

among Adventists in California, although they were older (mean age ≈ 55 years) than the students in our study.⁷ Similarly, studies with non-Adventist vegetarians reported a lower prevalence of overweight and obesity.

Limitations

The findings of the current study should be interpreted in the light of some limitations. All analyses were based on self-reported heights and weights that likely had inaccuracies. Although the overall the number of surveys collected from each school (13% of the entire student population in Oakwood University and 7% in Southern Adventist University) was representative of the entire student body, the power of some results was reduced because of small sizes of some subgroups.

Conclusions

The prevalence of overweight and obesity among Seventh-day Adventist college students differs by ethnicity; African Americans have higher rates. Although in general, the prevalence of overweight and obesity among Adventist college students is lower than that among non-Adventist students, the prevalence among African American students is more than one-third. These students should be included in obesity prevention outreach programs.

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AUTHOR CONTRIBUTIONS

Design concept of study: Pawlak, Sovyanhadi
Acquisition of data: Pawlak, Sovyanhadi

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