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An Empirical Analysis of College Students' Perceptions of Their Health and Weight Status

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Results from a survey of 441 college students suggest that weight gain rises with age and household income, but falls with household size, race, and number of minutes devoted to exercise. Body mass index was invariant to academic classifications, marital status, and gender. Some of the weight gain may be a function of students' misperceptions about their health and weight. For example, 27.3 percent of students who indicated their weight was about right were obese, and 11 percent who rated themselves as being in excellent health were actually obese.

The World Health Organization reports that globally more than one billion adults are overweight and about 300 million of these persons are obese. Additionally, at the global level about 22 million children under five years old are overweight and they are developing some of the obesity-related health problems that are traditionally associated with adults. Obesity is defined as excess body fat and is characterized by a body mass index (BMI) of at least 30. Overweight, on the other hand, means weighing too much. Both terms imply that an individual's weight falls outside the range for what is considered to be healthy for his or her height. Obesity builds over time and often results when calories-in exceed calories-out. The balance between calories-in and calories-out can be thrown out of kilter because of genetic makeup, overeating, eating high-fat foods, and not being physically active. Being obese increases the risks of developing chronic diseases such as type 2 diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer: breast, colon, prostate, kidney, and gallbladder (World Health Organization n.d.).

Overweight and obesity rates are also at epidemic levels in the United States, and costs for treating obesity-related illnesses are approaching unsustainable levels. Estimates are that obesity costs the United States about \$147 billion annually and that the cost for treating an obese person is \$1,400 higher per year than the cost for treating a normal-weight person (Pearson 2009). Researchers

at the Centers for Disease Control and Prevention suggest that obesity and overweight now affect all demographic and socioeconomic groups, and geographical locations in the country. However, the highest rates are in the South and Midwest. Additionally, African-Americans have the highest obesity rate in the United States compared to other ethnic groups and a 51 percent greater prevalence of obesity than Caucasians.

Based on the research findings, there are several reasons for the weight disparities among African-Americans, Hispanics, and Caucasians in the United States. First, African-Americans are less likely to be actively involved in physical activities. Second, because of attitudes and cultural mores, they do not necessarily view obesity and overweight in the same manner as do other races. Third, African-Americans often have very limited access to healthy affordable food and safe places to engage in physical activity (*Morbidity and Mortality Weekly Report* 2009). Fourth, low-income households often consume inadequate amounts of fruits and vegetables because of higher prices and limited access to large chain supermarkets (Chaloupa and Powell 2008; Dubowitz et al. 2008). Fifth, eating is an automatic behavior and the environment has more control than do individuals (Cohen and Farley 2008). Cohen and Farley describe automatic behaviors as those that occur without awareness, are initiated without intention, tend to continue without control, and operate efficiently or with little effort. Thus obesity and overweight cannot be effectively addressed without considering these factors. Sixth, spending in fast-food establishments have grown from \$6 billion to \$110 billion over the past three decades; physical activity for adults and children continue to decline, while hours spent watching television, using the computer, or playing video

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games have been increasing (Stroup et al. 2009; *Trust for Health* n.d.).

Louisiana has always ranked within the top ten states when measured by obesity rates, and as of 2008 the state's obesity rate was 28.3 percent. Although African-Americans compose only 30 percent of state's population, their obesity rate is 35.9 percent. In addition to serious health problems, research also has linked obesity to increased health care costs, reduced quality of life, and increased risk for premature death. Andreyeva, Sturm, and Ringel (2004) suggest that a BMI of 35 to 40 is associated with twice the increase in health care expenditures compared to expenditures for persons of normal weight, while a BMI above 40 doubles health care costs. Furthermore, as the global economic crisis continues, proponents and opponents alike recognize that health care reform is a key component for the United States to sustain long-term economic growth and competitiveness. Without serious reform, the government, families, and businesses will continue to be saddled by huge health care expenditures and the number of uninsured Americans will continue to rise.

The President's Council of Economic Advisers estimates that health care expenditures, currently 18 percent of the Gross Domestic Product, could rise to one-third by 2040 and the number of Americans without health insurance could increase from the estimated level of 46 million to about 72 million over the next 30 years (Romer 2009). These levels of expenditures on health care and the increasing numbers of uninsured individuals are unsustainable and inconsistent with maintaining a prosperous economy. As the number of overweight and obese individuals in the United States continues to rise at alarming rates, so also does the cost for treating weight-related illnesses. Given Louisiana's budget challenges, the state's fourth-place obesity ranking nationwide, and the rising numbers of young adults who are overweight or obese, our study assesses weight status and perceptions about health by selected college students in Louisiana.

Objectives

This study documents college students' perceptions of their overall health and weight status; examine the links between perceptions of health and weight and BMIs; and determines the main factors that influence students' BMIs.

Data and Procedures

The study's data were compiled from a random sample of 441 university students during spring and fall 2008. The survey generated data on students' general attitudes toward health and diet, their knowledge of links between diet and health, sources of nutritional information, food-label use, weight and height, perceptions of weight and health, and sociodemographic characteristics (age, academic classification, household size, marital status, annual household income, race, and gender). To satisfy the stated objectives, students were asked to indicate whether their health was (1) poor, (2) fair, (3) good, (4) very good, or (5) excellent. In terms of weight perceptions, students were asked to rate whether they considered themselves overweight, underweight, or about right.

Variable Definitions

The dependent variable, BMI, is determined from students' self-reported height and weight. BMI is a measure of body fat and is based on the height and weight of both adult men and women. It is calculated either by using an individual's weight in pounds and height in inches or weight in kilograms and height in meters. Equation 1 reflects the BMI formula used in our study.

$$(1) \text{ BMI} = \left[\frac{\text{Weight in pounds}}{\text{Height in inches}^2} \right] \times 703.$$

There are four primary BMI categories: underweight ($\text{BMI} \leq 18.5$), normal weight ($18.5 \leq \text{BMI} \leq 24.9$), overweight ($25 \leq \text{BMI} \leq 29.9$), and obese ($\text{BMI} \geq 30$). Based on the literature, the researchers hypothesize that BMI is affected by age (AGE); academic classifications (FRESHMAN, SOPHOMORE, JUNIOR, or SENIOR); household size (HHSIZE); marital status (STATUS); household income (INCOME); race or ethnicity (RACE); gender (GENDER); and by physical activity (MINEX). Table 1 shows the selected variables, their definitions, arithmetic means, and standard deviations. The researchers also hypothesized that a linear relationship existed between the dependent variable (BMI) and the selected independent variables (Equation 2).

Table 1. Variables, Definitions, and Descriptive Statistics.

Independent variables	Variable definitions	Mean	Std. deviation
AGE	Respondents' age in years	20.44	7.718
FRESHMAN	Respondent is a freshman = 1; otherwise = 0	0.35	0.479
SOPHMORE	Respondent is a sophomore = 1; otherwise = 0	0.20	0.403
JUNIOR	Respondent is a junior = 1; otherwise = 0	0.17	0.374
SENIOR	Respondent is a senior = 1; otherwise = 0	0.21	0.410
HHSIZE	Number of household members	3.31	1.686
STATUS	Single, never married = 1; otherwise = 0	0.83	0.380
INCOME	Household income < \$34,999 = 1; otherwise = 0	0.36	0.480
RACE	African-American = 1; otherwise = 0	0.87	0.333
GENDER	Female = 1; male = 0	0.58	0.494
MINEX	Minutes exercised	37.03	38.386
Dependent variable			
BMI	Body mass indices	26.61	6.047

$$(2) \quad \text{BMI} = \beta_0 + \beta_1 \text{AGE} + \beta_2 \text{FRESHMAN} + \beta_3 \text{SOPHMORE} + \beta_4 \text{JUNIOR} + \beta_5 \text{SENIOR} + \beta_6 \text{HHSIZE} + \beta_7 \text{STATUS} + \beta_8 \text{INCOME} + \beta_9 \text{RACE} + \beta_{10} \text{GENDER} + \beta_{11} \text{MINEX} + \varepsilon, \varepsilon \sim [\mu = 0; \sigma = 1].$$

The betas (β s) are the unknown parameters to be estimated, and ε represents the random stochastic error. The error is assumed to be normally distributed with mean of zero and a standard deviation of one. The model was estimated with the linear regression procedure in the *Statistical Package for Social Sciences (SPSS)* version 12.0.

Empirical Results and Discussion

Descriptive Statistics

From Table 1, the average age of students is about 20 years old; most of the respondents are freshmen (35 percent); the average household size consists of about four persons; the majority of the students (83 percent) are unmarried; 36 percent of the respondents reported household income below \$34,999; the majority of the students (87 percent) are Afri-

can-Americans, and 58 percent are female. Students exercised an average of 37 minutes.

Based on the results in Table 2, six percent of the students perceive their health as excellent, 20 percent as very good, 42 percent as good, and 25 percent as fair. On the question of weight status, 57 percent of the students perceive their weight as about right, and about 29 percent perceive themselves as overweight (Table 3). Our computations of BMIs suggested that three percent of respondents were underweight, 45 percent had healthy weight, 29 percent were overweight, and 23 percent were obese. Table 4 shows the cross tabulations between students' perceptions of their health and their computed BMIs. From the table, 44 percent of the respondents who rate their health as excellent are overweight, and 11 percent are obese. Furthermore, although 48.4 percent of the respondents who categorized their health as good had normal weight, there were also misperceptions about weight status in this group of respondents. For example, about 29 percent of these respondents were overweight and almost 20 percent were obese (Table 4). Table 5 presents the cross tabulations between weight perceptions and students computed BMIs. The results suggest that 34 percent of the respondents who rated

Table 2. Students' Perceptions of Their Overall Health.

Response categories	Percentages
Poor	2.3
Fair	24.5
Good	42.2
Very good	20.0
Excellent	6.0
Do not know	5.0

Table 3. Students' Perceptions of Their Overall Weight.

Response categories	Percentages
About right	57.4
Overweight	28.6
Underweight	7.0
Do not know	7.0

Table 4. Students' Perceptions of Their Overall Health and Actual Weights in Percentages.

Categories	Underweight	Normal weight	Overweight	Obese
Poor	0	10.0	10.0	80.0
Fair	0.9	43.5	24.1	31.5
Good	3.2	48.4	29.0	19.4
Very good	4.5	47.7	30.7	17.0
Excellent	3.7	40.7	44.4	11.1
Do not know	0	40.9	27.3	31.8

Table 5. Students' Perceptions of Their Overall Weight and Actual Weights in Percentages.

Categories	Underweight	Healthy weight	Overweight	Obese
About right	4	61.7	27.3	7.1
Overweight	0	5.6	34.9	59.5
Underweight	6	80.6	12.9	0
Do not know	0	38.7	29.0	32.3

their weight as "about right" were either overweight (27 percent) or obese (seven percent). Additionally, about 13 percent of those who believed they were underweight were actually overweight, while 81 percent had healthy weight.

Results from the Linear Regression Model

The estimated results for the linear model are presented in Table 6. The estimated F coefficient (11, 429) is 4.033 and is statistically significant at the one percent level of probability. Thus the estimated model performs better than the intercept-only model. In fact, if the selected independent variables are excluded from the model, the average BMI is 28.854, which falls in the overweight category. Furthermore, BMI is positively influenced by age and household income and negatively influenced by household size, race, and number of minutes exercised. Thus as students' ages and household income increase, *ceteris paribus*, average BMI also increases. Average BMI is lower for ethnic groups who are not African-Americans, for larger households, and for respondents who exercise regularly. The finding on physical activity is consistent with

the literature and reinforces the fact that exercise must be an integral part of any strategy to control weight. Finally, BMI is invariant to academic classifications, marital status, and gender.

Concluding Remarks

Overweight and obesity are not only a state and national issue, but also a global issue affecting all ages and socioeconomic groups. The obesity epidemic is so pervasive that it now exists in developing countries that have severe under-nutrition and malnutrition problems. Some researchers have coined the term *obesogenic* to describe the American society because of the excessive consumption of unhealthful foods and lack of physical activity. Obesity has been linked to excessive caloric intake and sedentary lifestyles. If the current obesity trend continues, some are predicting that all adults in the United States will be obese by 2048. These are alarming statistics because the costs for treating obesity-related illnesses are also on an unsustainable trajectory; as health care costs continue to rise, they are putting a tremendous strain on state and federal budgets.

Table 6. Regression Estimates for Factors Associated with Body Mass Indices.

Variables	Estimated coefficients	Standard error	P-value
CONSTANT	28.854***	1.392	0.000
AGE	0.119***	0.043	0.005
FRESHMAN	-0.361	1.351	0.789
SOPHOMORE	0.600	1.437	0.676
JUNIOR	-0.238	1.482	0.873
SENIOR	-0.214	1.469	0.884
HHSIZE	-0.731***	0.178	0.000
STATUS	-0.613	0.796	0.442
INCOME	1.202**	0.598	0.045
RACE	-1.464*	0.875	0.095
GENDER	-0.504	0.577	0.383
MINEX	-0.014*	0.008	0.061
F-VALUE	4.033***		0.000

*, **, and *** imply statistical significance at the 10, 5, and 1 percent levels of probability, respectively.

Louisiana's rising obesity rates are reflected in the growing numbers of children and young adults who are overweight or obese. Our study's findings suggest that exercise is a positive force in combating weight gain, but that there are misperceptions about health and weight status. Food labels were introduced in 1994 to give consumers easier access to nutritional information. However, overweight and obesity rates continue to climb. The United States will face enormous health care and budgetary challenges in the future. Therefore every effort must be made to educate us about nutrition and health so as to decelerate obesity's rate of growth. The Centers for Disease Control and Prevention have intensified their efforts to get Americans to eat more fruits and vegetables and to reduce consumption of high-calorie, high-sugar foods. Despite these efforts, we must all begin to learn more about nutrition and health, become more physical active, and make better food and lifestyle choices.

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