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Research Report: Students' Perceptions of Weight and Health Status and Factors Influencing Their Body Mass Indices

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Abstract

The results of this study suggested that there were no statistically significant differences between how two selected groups of students perceived their overall health and weight status. However, when perception levels were paired with four body mass indices (underweight, normal weight, overweight, and obese), the results were statistically significant. Despite some divergences among perceptions and body mass indices, students who assessed their weight as "about right" and their health as "excellent" were more likely to fall in the normal weight classification than in other classifications. Age, household size, gender, resident status, fruit consumption, and perceptions of health status influenced students' body mass indices.

Keywords: weight and health status, body mass indices, students, fruit and vegetable consumption, fast food, obesity

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Introduction

The United States has been battling rising levels of overweight adults and obesity for several decades without much success. For example, from 2017–2018, 42.4% of adults aged 20 and over were obese compared to 30.5% from 1999–2000. Severe obesity rates increased from 4.7% in 1999–2000 to 9.2% in 2017–2018. Among adults aged 20–39, the current obesity rate is about 40%, and the rate for severely obese adults is about 9.2% higher among women compared to men and among non-Hispanic black adults compared to other races (Hales et al., 2020). Rising obesity rates have always been a concern given the health risks associated with being obese and the costs of treating obesity-related illnesses. In fact, researchers have identified several diseases directly or indirectly linked to obesity and to rising healthcare costs. Among the diseases are hypertension, high LDL cholesterol, low HDL cholesterol, type 2 diabetes, coronary heart disease, strokes, gallbladder disease, osteoarthritis, sleep apnea, and breathing problems, among others (Centers for Disease Control and Prevention, 2021a).

Researchers have long held the view that the quality of a person's life is linked to physical, psychological, cultural, genetic, sociodemographic, and environmental factors, among others, and that many of these factors contribute to rising overweight and obesity rates both domestically and globally (Choi, 2020). Food preferences are developed at an early age but can diverge in college, when financial and other stress factors often worsen students' dietary habits and reduce physical activity, resulting in weight gains and obesity (Sogari et al., 2018; Caso et al., 2020; Nho and Chae, 2021; Wongprawmas et al., 2021).

Embarking on a new endeavor, such as enrolling in a university, can be a stressful event and is compounded when academic stress is combined with worrying about money. These stressors often result in unhealthy eating habits and weight gains among many students. Consequently, considerable amount of research is being done at the college and university levels to help students make healthier food choices to lower the exploding overweight and obesity rates and related costs of treating diet-related illnesses (Abraham et al., 2018). Nelson et al. (2007), for example, observed that overweight and obesity levels rose in the two groups of students they studied and that the levels were higher among males, African Americans, and students of lower socioeconomic status, but were lower among Asians. They also noted that television viewing and inactivity were associated with obesity. Nho and Chae (2021) found significant differences in health-promoting behavior, psychological distress, body weight, and other factors among participants in their study of overweight or obese female college students in Korea.

Overweight and obesity rates among young adults in Louisiana and across the United States have increased rapidly over the past 25 years. In 2020, Louisiana's adult obesity rate was 38.1%, and the rate among non-Hispanic black adults was 45.2%. The data also indicated that Louisiana residents between the ages of 18–24 were becoming obese at the fastest rate. The student population we studied is primarily non-Hispanic black adults, which gives us an excellent opportunity to study students' perceptions about diet and health and to address any misconceptions they may have on these issues.

Objectives

The study's overall objective is to examine students' perceptions of their weight and health status and their eating habits over two survey periods. The specific objectives are (i) to compare weight and health perceptions and body mass indices (BMI) for two randomly selected groups of students and (ii) to examine whether students' BMI are associated with selected socioeconomic and behavioral factors, such as age (Age), resident status (Live), household size (Hsize), marital status (Single), household income (Income), race (Race), gender (Female), fruit consumption (Fruit), vegetable consumption (Veget), fast-food consumption (Fastfood), and health perceptions (Health) during the two survey periods.

Methods and Procedures

Researchers in the Agricultural Economics Program have been conducting campuswide student surveys at 5-year intervals for more than 25 years. The surveys are based on each project's objectives and are funded by the U.S. Department of Agriculture. In the 2010–2014 survey, the researchers surveyed 402 students and collected data on nutritional knowledge, eating habits, and perceptions of health and weight status, among others. Based on a 5% margin of error and a 95% level of confidence, the 2020–2024 survey will contain at least 367 respondents and will capture data on students' levels of financial literacy and financial stress, eating habits, and perceptions of health and weight status, among others. The multistage sampling method has been used in all cases to obtain the samples.

The study's data were compiled from two random samples, each containing 132 students from the 2010–2014 and 2020 surveys. The specific questions analyzed were as follows: (i) "Would you say that, in general, your health is poor, fair, good, very good, or excellent?" (ii) "Do you consider yourself to be overweight, underweight, or about right?" (iii) "About how much do you weigh (in pounds) without shoes?" (iv) "About how tall are you (in feet and inches) without shoes?" (v) "In general, how many times per day would you say that you eat fresh fruits?" (vi) "In general, how many times per day would you say that you eat fresh vegetables?" and (vii) "In general, how many times per day would you say that you eat fast food meals?" Data were also collected on age, academic classification, household size, marital status, family's total annual household income, race, and gender. BMI were determined using the formula (weight in pounds ÷ height in inches^2) x 703. We used the following BMI classifications in the study: underweight (BMI≤18.5); normal weight (18.5≤ BMI≤ 24.9); overweight (25≤ BMI≤ 29.9); obese (BMI≥30) (Centers for Disease Control and Prevention, 2021b). The data were analyzed using descriptive statistics, *t*-tests, chi-square tests for independence, and linear regression. The linear regression model used to estimate relationships between BMI and the selected independent variables for the two time periods is shown in Equation 1. The variables and their definitions are shown in Table 1.

$$BMI = \beta o + \beta_1 Age + \beta_2 Live + \beta_3 Hsize + \beta_4 Single + \beta_5 Income + \beta_6 Race + \beta_7 Female +$$

$$\beta_8 Fruit + \beta_9 Veget + \beta_{10} Fastfood + \beta_{11} Health + \varepsilon$$

Table 1. Variables and Definitions

Variables	Definitions
Independent Variables	
Age	Participants' age in years
Live	Lives on campus = 1; Lives off campus = 0
Hsize	Number of persons living at participant's permanent address
Single	Single = 1; Otherwise = 0
Income	Family's total household income: < $15,000; $15,000-$24,999; $25,000-$34,999; $35,000-$49,999; $50,000-$74,999; $75,000 and over
Race	African American = 1; Otherwise = 0
Female	Female = 1; Male = 0
Fruit	Fruit consumption (times/day): = 0, = 1, or ≥ 2
Veget	Vegetable consumption (times/day): = 0, = 1, or ≥ 2
Fastfood	Fast food consumption (times/day): = 0, = 1, or ≥ 2
Health	Poor/fair = 0; good/very good/excellent = 1
Dependent Variable	
BMI	Body Mass Indices

Empirical Results and Discussion

Tables 2–4 show the two-period comparisons between students' perceptions of their weight and health status and the computed BMI for both periods. The results suggest that there are no statistically significant differences in students' perceptions of their weight and health status and the computed BMI for the periods studied. However, when weight perceptions are compared to the computed BMI, statistically significant differences emerge. In both survey periods, students continued to place themselves in the wrong weight category (see Table 5). For example, in the 2010–2014 survey, 26% thought their weight was about right when in fact, they were overweight, and 16% of the students were actually obese. Additionally, 57% who viewed themselves as overweight were obese, and 67% who perceived themselves as underweight fell in the normal weight category. The pattern is similar in the 2020 survey. The results in Table 6 also indicate some misperceptions about health status and the computed BMI. A large percentage of students who thought they were in good, very good, or excellent health were overweight or obese. However, 42% and 36% of the students in the two periods correctly linked their health status (poor/fair) with their BM1category: obese. The statistically significant $\chi 2$ coefficients in Tables 5 and 6 imply that the null hypotheses that the response categories are independent are rejected at the 10% and 1% levels of probability, respectively.

Table 2. Students' Weight Perceptions by Time Periods (%)

Responses	2010–2014	2020	*t*-Value	*p*-Value
About right	53	54		
Overweight	40	35		
Underweight	7	11	-0.307	0.760

Table 3. Students' Health Perceptions by Time Periods (%)

Responses	2010-2014	2020	*t*-Value	*p*-Value
Poor	6	6		
Fair	20	21		
Good	36	42		
Very good	29	23		
Excellent	9	8	0.758	0.450

Table 4. Computed Body Mass Indices by Time Periods (%)

Responses	2010-2014	2020	*t*-Value	*p*-Value
Underweight	4	4		
Normal weight	39	44		
Overweight	26	24		
Obese	31	28	0.571	0.569

Table 5. BMI and Weight Perceptions by Time Periods (%)

Categories	Underweight	Normal Weight	Overweight	Obese	χ2	p-Value
2010–2014						
About Right	4	54	26	16		
Overweight	0	13	30	57		
Underweight	33	67	0	0	55.924***	0.000
Total	4	39	26	31		
2020						
About Right	1	63	28	8		
Overweight	0	13	20	67		
Underweight	29	50	21	0	81.440***	0.000
Total	4	44	24	28		

Note: ***indicates statistical significance at the 1% level of probability.

In time period 1, resident status, gender, fruit consumption, and perceptions of health influenced BMI. Thus, students who lived off campus, male students, those who consumed fruits, and those who perceived their health as being good, very good, or excellent had lower BMI levels than their corresponding counterparts (see Table 7). BMI levels in time period 2 were influenced by age, household size, and health perceptions. These findings imply that the younger students, those from larger households, and those who ranked their health as being good, very good, or excellent had lower BMI than their corresponding counterparts (see Table 8). Given that the sample responses have the same variances, we can conclude that there were no variabilities in students' responses from the two surveys. Therefore, the university can continue to offer the health and wellness courses currently in place but instructors must intensify their efforts in encouraging students to adopt healthier eating habits and to learn their correct weight classification.

Table 7. Estimated Results for the BMI Model for Time Period 1

Variables	Estimated Coefficients	Std. Error	*t*-Value	*p*-Value
Constant	31.030***	6.595	4.705	0.000
Age	0.161	0.138	1.166	0.246
Live	-2.685**	1.196	-2.245	0.027
Size	-0.314	0.922	-0.340	0.734
Single	-2.476	2.801	-0.884	0.378
Income	0.283	0.533	0.532	0.596
Race	2.639	1.845	1.430	0.155
Gender	-3.926***	1.286	-3.054	0.003
Fruit	-1.187*	0.694	-1.711	0.090
Veget	0.147	0.672	0.219	0.827
Fastfood	-0.205	0.467	-0.438	0.662
Health	-3.621***	1.177	-3.075	0.003
F-Value	2.967***			0.002
$\bar{R}^2$	0.142			

Note: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% levels.

Table 8. Estimated Results for the BMI Model for Time Period 2

Variables	Estimated Coefficients	Std. Error	*t*-Value	*p*-Value
Constant	36.314***	5.018	7.237	0.000
Age	0.114*	0.064	1.785	0.077
Live	-1.108	1.312	-0.845	0.400
Size	-2.597**	1.233	-2.107	0.037
Single	-1.988	2.269	-0.876	0.383
Income	-0.013	0.618	-0.021	0.983
Race	-2.179	1.958	-1.113	0.268
Gender	-1.062	1.468	0.723	0.471
Fruit	-1.115	1.093	-1.020	0.310
Veget	0.037	1.026	0.036	0.971
Fastfood	-0.559	0.984	-0.568	0.571
Health	-3.359**	1.370	-2.451	0.016
F-Value	2.074**			0.027
$\bar{R}^2$	0.083			

Note: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% levels.

Summary and Conclusions

Louisiana's obesity rates have risen steadily over the past 25 years, with most of the growth occurring in the 18–24 age group and among African Americans. The majority of the students at our university are between 18–24 years old and are African Americans. Therefore, the university is an excellent venue for studying weight and health perceptions and eating habits. The homogeneity between the two samples suggests that the student body has not changed significantly over the two survey periods. Therefore, our nutritional strategies are still appropriate for the current

student body. Nevertheless, because students continue to place themselves in the wrong weight categories, we must target our efforts in this area and help students to learn about BMI classifications and how to make healthier food choices and lifestyle changes that will put or keep them in the normal weight category.

The United States is facing a severe health crisis because of the rising numbers of overweight and obese residents. Healthcare costs for treating diet-related illnesses are approaching unsustainable levels. Thus, there is an ongoing need for efforts such as those at our institution to educate young adults on how to improve their dietary habits and lifestyles so as to lessen the strain on the healthcare system. The pandemic uncovered several cracks in the U.S. healthcare system and also highlighted the negative health outcomes that obese and severely obese persons can face from the COVID-19 virus.

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