



Research Article

# The 'Freshman 15': Exploring Weight Issues, Eating Patterns, Psychological, Mental Health, Stress, and Weight Loss Prevention Programs among College Students at East Carolina University

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## Abstract

The transition to college has been identified as a critical period for increases in overweight status. The belief that college students gain 15 lbs during freshman year is widespread, yet the evidence for this is limited. Previous research studies have shown that approximately 51% to 72% of freshman students' gain weight their freshman year.

**Objective:** The specific aims of our exploratory, quantitative and qualitative study were to: (1) to assess their perceptions and beliefs about overweight and obesity; (2) to examine their eating patterns; (3) to evaluate the specific psychosociocultural factors associated with college life; and (4) to find out what type of weight loss prevention program they prefer.

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**Methodology and Data:** During the summer of 2018, our research team conducted an online Qualtrics survey among 232 freshman and sophomore students at East Carolina University with the assistance of the East Carolina University's Survey Research Center (SRO) to investigate their belief of the 'Freshman 15' and determine what type of overweight prevention program if needed works best for college students.

**Results:** From our analyses of the quantitative data, we found that Fifty (50%) percent of our sampled students agreed that believing in the 'Freshman 15' concept affected their individual daily lives a "great deal" and "a lot". The data further indicated that these students placed a high priority on needing to lose weight and maintaining a healthy weight. The findings related to eating patterns among college students showed that a majority (48%) percent ate three meals a day; Sixty-Five (65%) ate a healthy dinner multiples times per week; and Forty-Two (42%) ate a local fast food restaurant once a week. Overall, students perceive their general health status as in very good standing. Findings indicated that Forty-One (41%) percent felt "Good" about their general health; Thirty-One (31%) percent felt "Very Good" about their health; and Seven (7%) percent felt "Excellent" about their health. Thus a total of Seventy-Nine (79%) percent of our student sample felt that their general health status was good to excellent.

However, we uncovered some startling data from our sampled students related to their psychological, mental health and stress-related issues. Twenty-Eight (28%) percent felt down, depressed or hopeless for several days. Forty (40%) percent had trouble falling asleep, staying asleep, or sleeping too much for several days. Forty-Seven (47%) felt tired or have little energy for several days. Twenty-Six (26%) percent felt that they are a failure or have let themselves or family down for several days. Most importantly, Ten (10%) percent experienced thoughts that they would be better off dead or hurting themselves in some way for several days.

**Conclusions/implications:** Finally, our sample of students provided a wide variety of suggestions for developing a weight loss prevention program for college students. We anticipate that the data gathered in this pilot study will help to bring awareness and action among college health educators, nutritionists, mental health counselors as well as high-ranking college administrators to collectively work with college students in improving their healthy life style while attending East Carolina University. Although this study was a small pilot study, we believe that the overall findings indicate that East Carolina University students deserve proper attention to these public health, psychological, mental health and stress-related issues.

**Keywords:** College students; Eating Patterns; Freshman 15; Health behaviors; Mental health; Psychosociocultural factors; Public health; Stress; Weight loss prevention program

## Introduction

Freshman 15 refers to the belief that college students frequently gain 15 lbs during their freshman year. The belief that college students gain 15 lbs during freshman year is widespread, yet the evidence for this is limited. Although results across studies are somewhat inconsistent, multiple investigations have suggested that the transition to

college can be a time of significant and rapid weight gain. Recently, more research studies have shown that approximately 51% to 72% of freshman students' gain weight their freshman year. Among those who gain weight during their freshman year, the average weight ranged from 4.6 to 7.4 pounds. In addition, specific groups of freshman students such as women and racial/ethnic minorities tended to gain more weight than other groups of students [1-9].

The specific aims of our exploratory, quantitative study of 232 freshman and sophomore students at East Carolina University are: (1) to assess their perceptions and beliefs about overweight and obesity; (2) to examine their eating patterns; (3) to evaluate the specific psychosociocultural factors associated with college life; and (4) to find out what type of weight loss prevention program they prefer. This initial exploratory study and the data that we collected from this study will allow us to plan a much larger two-phased quantitative and qualitative study which will consist of over 2,000 students being investigated via online survey and focus groups.

In this exploratory study, we propose the following hypotheses:

- College freshman students do believe in the 'Freshman 15' weight gain
- College freshman students will experience weight gain the first year of college
- College freshman students will experience high levels of mental and physical stress

## Background

Since our research study is based at East Carolina University and a majority of our student sample comes from a designated rural health disparity area, we have a unique opportunity to investigate issues among rural Americans. East Carolina University, founded in 1907, is a public university located in Greenville, North Carolina. It is a progressive doctoral-granting institution with the feel of a small college. Its 392-acre main campus and 46-acre medical campus are both located in Greenville. Forty-six additional acres are located in a nearby county and most campus facilities have been constructed since the 1970s.

East Carolina University and Greenville, North Carolina have a geographic location and history that promotes a strong culture of service to eastern North Carolina and throughout the state. The community service culture challenges the institution to continuously strive to meet the area's employment needs in the growing service, construction, manufacturing, education, healthcare and agriculture industries. East Carolina University student population is diverse. The ethnicity breakdown is as follows: 69.3% White, 16.3% Black/African American, 6.2% Hispanic/Latino, 2.7% Asian, 0.6% American Indian/Alaskan Native, 3.1% Multiracial, 0.1% Native Hawaiian/Pacific Islander and 1.7% Unknown.

Rural Americans face a unique combination of factors that create disparities in health care not found in urban areas. Economic factors, cultural and social differences, educational shortcomings and the sheer isolation of living in remote rural areas all conspire to impede rural Americans in their struggle to lead a normal, healthy life. According to the Health United States 2001, Urban and Rural Health Chartbook, rural residents smoke more, exercise less, have less nutritional diets and are more likely to be obese than suburban residents. Thus, our

sample of freshman college students at East Carolina University may reflect the lifestyle patterns among many rural Americans but also provide an opportunity to intervene with an innovative overweight prevention program designed specifically for rural residents, racial and ethnic minorities, and other specific student population groups [10,11].

Given the dramatic increase in obesity among the U.S. population, determining whether college students particularly freshman college students are a risk factor for significant weight gain is important. Data from the American College Health Association showed that 21.6% and 12.5% of U.S. college students (N=80,121) were overweight and obese, respectively (American College Health Association 2011) [12]. Disparities in overweight exist among U.S. college students. Although a large portion of college students, irrespective of race/ethnicity, is at risk for poor health habits, African American college students are significantly heavier and gain more weight during college than other racial/ethnic groups [13]. In a U.S. national study of 24,613 students from 119 four-year colleges, overweight (obesity included) was more prevalent among African American college students (38.3%) compared with their White (26.7%), Asian (16.4%), Native American (30.6%) and Hispanic (30.2%) counterparts [14,15].

Additionally, there are some research studies which have examined how weight changes by racial/ethnic group across college. Some research shows that African American students have higher BMI (Body Mass Index) than Latino American and European American students [16]; other work shows no racial/ethnic differences in BMI between these groups [17]. In terms of weight gain, one study tested whether changes in weight and BMI varied by gender and race/ethnicity (predominantly European American, Asian and Latino American) across the first year of college and found no group differences [18]. Work on the general population of young adults (ages 18-30), however, suggest that African American gain more weight over a 5-year period than European Americans [19].

When research studies compare weight gain among freshman women and men, women experience greater weight gain than their male peers during first year of college. Quantitative data as well as qualitative data indicate that women are very concerned about weight gain during their freshman year. For some of the women, the 'Freshman 15' was the biggest fear or worry in their lives, and this worry seems to fuel dieting and weight preoccupation [20].

## Research Methods

This research study was an exploratory, quantitative, pilot study among 232 students at East Carolina University designed to provide preliminary data on the 'Freshman 15' concept and issues related to the psychological, mental health and stress aspects of weight in order to plan a much larger two-phased quantitative and qualitative study by the following year. The research team investigating the 'Freshman 15' concept and issues related to weight consisted of (1) a professor of nutrition science who analyzed all the nutrition, eating, and exercise data; (2) a professor of psychology who analyzed all the mental health and physical stress data; (3) a professor of biostatistics who analyzed all the quantitative data from the Qualtrics online survey; and (4) a professor of anthropology and public health who analyzed all of the biopsychosociocultural data.

Utilizing the services of the Thomas Harriot College of Arts & Sciences Center for Survey Research, this exploratory, quantitative, pilot study was conducted during the summer of 2019. The online Qualtrics survey was distributed to freshman and sophomore students beginning June 2019 and completed by the end of August 2019. A total of 232 students completed a majority of the questions asked in the online survey.

## Results

All data analyses were conducted by our research team member - a biostatistician who conducted descriptive analyses.

## Findings

In our Qualtrics survey of 232 freshman and sophomore students at East Carolina University during the summer of 2018, we found statistically significant data about:

- Student's perceptions of the 'Freshman 15'
- Specific psychological, mental health and stress-related issues associated with weight

These statistically significant findings enabled us to better understand how other issues such as the daily stressors of college life impact negatively college freshman and sophomore students at East Carolina University.

## Sociodemographics of student sample

Tables 1-3 shows the percentages among our sampled students which year they were in school (1<sup>st</sup> year undergraduate, 2<sup>nd</sup> year undergraduate), whether full-time or part-time students and their race and ethnicity. Table 1 shows that Sixty-Five (65%) percent of our sample who answered this question were actually 2<sup>nd</sup> year undergraduates (sophomores) and Thirty-Four (34%) percent were 1<sup>st</sup> year undergraduates (freshman). Table 2 shows that Ninety-Eight (98%) percent of our sample who answered this question were full-time students and only Two (2%) percent were part-time students. Finally, table 3 shows that Sixty-Three (63%) percent of our sample who answered this question identified themselves as White, Twelve (12%) percent identified themselves as Black or African American, Eleven (11%) percent identified themselves as Hispanic, Latino, or other Spanish origin, Two (2%) percent identified themselves as American Indian or Alaska Native, Three (3%) percent identified themselves as Asian, and Nine (9%) percent identified themselves as multiracial or more than one race.

	Frequency	Percent	Valid Percent	Cumulative Percent
1st year undergraduate	62	26.7	34.4	34.4
2nd year undergraduate	118	50.9	65.6	100.0
Total	180	77.6	100.0	
Missing	52	22.4		
Grand Total	232	100.0		

Table 1: Year in school.

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	177	76.3	97.8	97.8
No	4	1.7	2.2	100.0
Total	181	78.0	100.0	
Missing	51	22.0		
Grand Total	232	100.0		

Table 2: Full time student.

	Frequency	Percent	Valid Percent	Cumulative Percent
White	147	63.4	65.6	65.6
Black/African American	27	11.6	12.0	77.6
Hispanic/Latino	20	8.6	9.0	86.6
American Indian/Alaska native	5	2.2	2.2	88.8
Asian	3	2.2	1.3	90.0
Multiracial	22	9.0	9.8	100.0
Total	224	97	100.0	
Missing	8	3		
Grand total	232	100.0		

Table 3: Race and Ethnicity.

Other findings related to the sampled students included Fifty-One (51%) percent live in campus residence hall, Eighty-Three (83%) percent are not a member of a social fraternity or sorority, and Eighty-Six (86%) percent have a family member/guardian who pays for their health insurance. Thus, the sociodemographics of our sampled students from our Qualtrics online survey were very much representative of the sociodemographics of the overall East Carolina University student population.

## Student's perception of 'Freshman 15'

One of the major objectives of this research study was to investigate the weight concept of the 'Freshman 15' and whether students believe that one's weight should be of concern while in college. The response from the question, "To what degree do you believe the weight concept known as the 'Freshman 15' affects students," Fifty (50%) of the sampled students responded "A Great Deal" or "A lot." Table 4 shows the response from the sampled students.

	Frequency	Percent	Valid Percent	Cumulative Percent
A great deal	52	22.4	23.0	23.0
A Lot	62	26.7	27.4	50.4
A moderate amount	82	35.3	36.3	86.7
A little	24	10.3	10.6	97.3
None at all	6	2.6	2.7	100.0
Total	226	97.4	100	
Missing	6	2.6		
Grand total	232	100		
Grand total	232	100.0		

Table 4: Belief in 'Freshman 15'.

**The positive response to this question from the sampled students also correlated to the issues of:**

- Awareness of weight concept often referred to as 'Freshman 15' ( $p < 0.03$ , Pearson's  $r = 0.15$ )
- Weight gained the first year of college ( $p < 0.01$ , Pearson's  $r = 0.39$ )
- Need to lose weight ( $p < 0.01$ , Pearson's  $r = 0.35$ )
- Maintain a healthy weight ( $p < 0.06$ , Pearson's  $r = 0.13$ )

Although the strength of the Pearson's correlations indicated a weak association with the four variables (awareness, weight gained, need to lose weight and maintain healthy weight), it did however show a positive relationship to all four variables. Thus a majority of our students are concerned about several issues related the 'Freshman 15'.

**Eating patterns**

Another specific aim of this study was to evaluate the eating patterns among college students. Our Qualtrics survey asked several questions in this area and we found a number of interesting eating patterns among our sample of college students. For example, we found that Forty-Eight (48%) percent ate three meals a day; Thirty-Five (35%) percent ate two meals a day; and Thirteen (13%) percent ate four meals a day (Table 5). Thus a majority of our students ate three meals a day which was a pleasant surprise since college students tend to "believe" that they have less time to eat a meal.

	Frequency	Percent	Valid Percent	Cumulative Percent
1	2	9	1.0	1.0
2	70	30.2	35.4	36.4
3	95	40.9	48.0	84.3
4	25	10.8	12.6	97.0
5	3	1.3	1.5	98.5
6	3	1.3	1.5	100.0
<b>Total</b>	198	85.3	100.0	
<b>Missing</b>	34	14.7		
<b>Grand total</b>	232	100.0		

**Table 5:** Meals eaten in a day.

We found another interesting eating pattern among our sample of college students. When students were asked, "How often do you eat a healthy dinner, lunch and breakfast (which consisted mostly of fruits, vegetables, lean meats and whole grain)", we discovered that Sixty-Five (65%) percent ate a healthy dinner multiple times a week; Fifty-Nine (59%) percent ate a healthy lunch multiples times a week; and Thirty-Six (36%) percent ate a healthy breakfast multiple times a week. Thus a majority of our students ate a healthy dinner and lunch - multiple times a week.

Another interesting eating pattern among our sample of college students involved their frequency of eating at local fast food restaurants. When asked, "How often do you eat a local fast food restaurant? We found that Forty-Two (42%) percent ate at a local fast food restaurant once a week; Twenty-Seven (27%) percent ate at a local fast food restaurant multiple times a week; and Twenty-Three (23%) ate at local fast food restaurant once a month (Table 6). Thus a majority of our students ate at a local fast food restaurant only once a week.

	Frequency	Percent	Valid Percent	Cumulative Percent
Never	9	3.9	4.6	4.6
Once a month	46	19.8	23.5	28.1
Once a week	83	35.8	42.3	70.4
Multiple times a week	53	22.8	27.0	97.4
Everyday	5	2.2	2.6	100.0
<b>Total</b>	196	84.5	100.0	
<b>Missing</b>	36	15.5		
<b>Grand total</b>	232	100.0		

**Table 6:** Eat at a local fast food restaurant.

With regards to which fast food restaurants many of our students frequent, the qualitative findings indicated that Bojangles, McDonalds, Chick-fil-a, Chipotle, Subway, Dominos, Taco Bell, Cook-out and Parker's Barbecue was their choice. Quite naturally, these local fast food restaurants were located on or nearby campus so they were easily accessible for on-campus living students. Our final Qualtrics survey question on eating patterns centered on nutrition education. We were concerned whether college students received any nutrition education learning opportunities from trained professionals on campus so we asked the question: "Now that you are attending ECU, have you received any education from a nutritionist on what constitutes a healthy eating pattern?"

We discovered that Sixty-Nine (69%) percent of our student sample responded "No" and Thirty-One (31%) percent responded "Yes." Thus, a vast majority of our student sample did not receive any education from a nutritionist on what constitutes a healthy eating pattern during their first or second year of college.

**Psychological, mental health and Stress related issues**

One of the most surprising discoveries of our study of the Freshman 15 concept among our sampled students were the responses from the question: "Over the past two weeks, how often have you been bothered by any of the following?" The nine options for response to the question were as follows:

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless
- Trouble falling asleep, staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself or that you're a failure or have let yourself or family down
- Trouble concentrating on things such as reading the newspaper or watching television
- Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual; and
- Thoughts that you would be better off dead or of hurting yourself in some way

**We discovered from our student sample the following:**

- Twenty-Eight (28%) percent felt down, depressed or hopeless for several days
- Forty (40%) percent had trouble falling asleep, staying asleep, or sleeping too much for several days
- Forty-Seven (47%) percent felt tired or having little energy for several days
- Twenty-Six (26%) percent felt about themselves or that they are a failure or have let themselves or family down for several days; and
- Ten (10%) percent experienced thoughts that they would be better off dead or hurting themselves in some way for several days

In particular, these set of responses from our sampled students indicated a number of serious psychological, mental health and stress-related issues they are experiencing during their freshman and sophomore years in college. Although it is typical that a certain number of freshman and sophomore students will experience higher levels of psychological, mental health and stress-related issues than their upper-classmates, it was surprising to note that the duration or longevity in days (several) of experiencing these psychological, mental health and stress-related issues lasted. The duration or longevity of days is a cause of major concern and should be further investigated because this may indicate a serious public health and mental health issue occurring among our freshman and sophomore students at East Carolina University.

**Overall general health & Weight loss prevention program**

After taking into consideration student’s psychological, mental health, stress-related issues associated with college living along with their eating patterns and beliefs about the ‘Freshman 15’, we asked one direct question about their overall health status. Our Qualtrics question stated, “Considering your age, how would you describe your general health?”

We discovered that Forty-One (41%) percent felt “Good” about their general health; Thirty-One (31%) percent felt “Very Good” about their health; and Seven (7%) percent felt “Excellent” about their health (Table 7). Thus a total of Seventy-Nine (79%) percent of our student sample felt that their general health status was good to excellent. The final major objective of our research study among college freshman and sophomore students at East Carolina University was to find out what type of weight loss prevention program they would prefer if there was an interest and need. The qualitative responses from our question, “What would you like to see in a weight loss or overweight prevention program at East Carolina University?” provided some new insight and potential direction as to the development of a weight loss prevention program.

**Here are a few of their responses:**

- “A fun, judge friendly environment that also gives you tips on healthy foods”
- “A therapy group so that we can talk about what we don’t like about our weight and at least 2 adult leaders putting this on who help us find ways to lose weight and we can all go on diets and workout together on a schedule time little bits at a time, but you can only join if you are 130 lbs and above but only if that weight is fat”

- “An online version as well. Because not everyone wants to leave to go to a meeting or anything. Some of us want to do it alone in our dorms”
- “Exercises that are bearable for beginners, teach good diet habits”
- “Food awareness such as the good foods you can eat while still being healthy. How to prepare them and cook as well, even if it is just simple stuff”
- Free access to a dietitian so that when we can manage our weight by knowing what to eat and having a meal plan of sorts”
- “Free community gatherings focused on healthy snacking/dieting with human health in mind through games, exercising, dance and friendships”
- “Healthier food options at dining halls and food locations. Time and convenience are huge factors when college students choose what to eat. A lot of the “grab and go” food options are unhealthy so it’d be nice to see more fresh fruit and vegetable options. For example, at the P.O.D. stores there are SHELVES of chips, candy, frozen pizzas, etc., but only one small basket of fruit and no vegetables. Because of that, I do a lot of my food shopping at off-campus grocery stores”
- “If ECU is looking for a way to help students with weight maybe they should add some healthy restaurants on campus. What are y’all adding in the new student center again?? Canes fried chicken, burger bar, another Starbucks and a bakery... Ridiculous. What about chipotle or Panera bread? Many people don’t understand calories. We don’t need more places with access to high calorie fried and fatty food”
- “I guess a good start would be awareness. For many students, this is the first time they are fully in charge of when and what they eat and many people’s schedules and habits change when they move to college. I also think the main cause of the Freshman 15 is stress eating and many people are not aware they do it”

	Frequency	Percent	Valid Percent	Cumulative Percent
Excellent	14	6.0	7.4	7.4
Very good	59	25.4	31.2	38.6
Good	78	33.6	41.3	79.9
Fair	29	12.5	15.3	95.2
Poor	8	3.4	4.4	99.5
Don't know	1	.4	.5	100.0
Total	189	81.5	100.0	
Missing	43	18.5		
Grand total	232	100.0		

**Table 7:** General health status.

**Conclusion**

Overweight college students are at-risk of becoming obese adults and thus prevention efforts targeting college-age individuals are key to reducing adult obesity rates in the United States. This quantitative and qualitative exploratory research study among college freshman and sophomore students at East Carolina University found answers to the beliefs and perceptions of the Freshman 15’, examined their eating patterns; uncovered specific psychosociocultural, mental health

and stress-related factors associated with college life, their general perceived health status along with the type of weight loss program preferred.

We anticipate that the data gathered in this pilot study will help to bring awareness and action among college health educators, nutritionists, mental health counselors as well as high-ranking college administrators to collectively work with college students in improving their healthy life style while attending East Carolina University. Although this study was a small pilot study, we believe that the overall findings indicate that East Carolina University students deserve proper attention to these public health, psychological, mental health and stress-related issues.

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## Conflicts of Interests

The authors declare no conflict of interest. The founding institution had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript and in the decision to publish the results.

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