

An Ecological Exploration of the Impact of Residence Hall Living on Fitness and Nutritional Behaviors

A Senior Honors Thesis

Submitted in Partial Fulfillment of the Requirements  
for Graduation in the Honors College

By

Sarah A. May

Public Health and Health Education

The College at Brockport State University of New York

December 17, 2015

### **Abstract**

Obesity is one of the leading causes of preventable death in the United States. Obesity places at risk for developing heart disease, hypertension and cancer. Obesity is increasingly more prevalent among college students due to personal, interpersonal and environmental facilitators. College is a time when students are beginning to develop habits that will remain with them for the rest of their lives. In order to combat this epidemic, college health professionals must examine strategies to increase the physical activity and the availability of healthy nutritional choices among students. Few studies have looked at the impact of residence hall living among students when attempting to make healthy choices. This study will use the Social Ecological Model to determine the intrapersonal interpersonal, and environmental barriers and facilitators that college students face as well as provide potential interventions.

**Table of Contents**

Abstract.....2

Background.....6

Determinants of College Student Nutritional Behaviors.....7

    Environmental.....8

    Interpersonal.....10

    Intrapersonal.....10

Methods.....13

Results.....15

Discussion.....16

    Time.....16

    Income.....17

    Dining Hall Characteristics.....19

    Peer Influence.....20

    Campus Climate.....23

    Alcohol.....24

    Residence Hall Environment.....25

Educational Programming.....	26
Technology.....	28
Limitations.....	32
Further Research.....	32
Conclusion.....	33
References.....	34
Tables.....	37

## **Background**

College is a new and exhilarating time in most young adult's lives. It is a time filled with independence and self-reliance. Along with these new, positive, changes comes the challenge of learning how to best handle this independence. Students are faced with the pressure of not only school work, but making new friends, and having to navigate peer influence associated with friendships. College is the time when students realize that they are the ones in charge of the lifestyle choices they make.

Many students begin to notice some rapid weight gain and a change in diet as they begin their college career. With food typically at their disposal in dining halls, restaurants, and vending machines, it can be tough to make and have the knowledge to make healthy choices. The 2014 American College Health Association National Health Assessment (ACHA-NCHA) shows that only 6.3 % of students received the recommended five servings of fruits and vegetables in a single day additionally only 32.9% of students participated in the recommended amount of exercise set by the American Heart Association and the American College of Sports Medicine (ACHA-NCHA, 2014). This type of inactivity and poor eating habits, leads to rapid weight gain that has the potential to stay with them for the rest of their lives. In 2014 22.5% of college students were overweight, 7.5% were labeled as class I obesity, 2.8% were class II obesity and 1.8% were class III obesity (ACHA-NCHA, 2014). Obesity is a growing problem in our country, and college can be a time to disrupt the cycle.

In addition to health problems, there is a severe cost when treating obesity related diseases. In 2008, \$147 billion dollars was spent on treating such diseases. More than a quarter

of America's health care expenses can be attributed to obesity. A major part of this expense is covered by private insurance agencies, but eventually it is transferred to the employers, and then the employees by increasing their premiums, copayments, and deductibles. Increasing obesity also leads to an increase in absenteeism which costs companies a tremendous amount of money, and decreases the earnings of the worker who is sick. There is evidence which shows that obese workers are less productive while working compared to a worker with a healthy BMI. This is estimated to cost employers an extra \$11.7 billion per year (Nichols & Yang, 2011). Obesity has the potential to limit a college graduate's ability to be a contributing member of society.

### **Determinants of College Student Nutrition Behaviors**

Students are at risk to be influenced by many different factors. Interpersonal and intrapersonal situations, along with environmental reasons, all play a role in how a student chooses to live. These factors can either be an enabler to healthy living, or a barrier when it comes to making healthy choices. Gaining an understanding, could be the key is fixing the obesity problem on college campuses.

During the time when adolescents are growing into young adults and moving away to college, many factors influence their new life. Not only are they faced with the struggle to make new friends and fit in, but they also have to learn how make independent decisions, and balance academics. These challenges may be something that they struggle with throughout their life. The choices students make in college lead to the choices they make later on. Students could potentially grow and thrive, but on the other hand, they are at risk for establishing poor behaviors (Nelson, 2007). For many, this is the first time students are away from home. They no longer

have their parents regulating what they do or when they do it. The behaviors and choices that they make are exclusively up to them, however, are influenced by a number of factors.

### **Environmental**

One of the most noted challenges and possibly the most important that students are faced with, is the capability and desire to either continue with the healthy lifestyle choices they were making under the supervision of their parents, or start to establish a foundation for a healthy life. Nutrition is a significant dimension influencing the overall health of a person. As an independent adult, it is now the student's responsibility to choose what they put in their body. The constant availability for unlimited food in the dining halls, vending machines filled with soda and candy, and the need for a quick easy meal can make it challenging to pick a healthy option. On top of that, the average student has trouble understanding a nutrition label (Kolodinsky, Green, Michahelles & Harvey–Berino, 2008). Labeling on packaged foods is shown to be most effective when instructions are included on how to read and understand the label. An analysis of customers who ate at Subway showed to have a decrease of 52 calories per meal when showed the calorie content compared to those who did not see it. Menu labeling laws have shown to affect how a person selects their meals (Nicholas & Yang, 2011).

The accessibility for healthy food can be one that many people struggle with, college students especially. With many contributing priorities, including, school, friends, jobs, and extracurricular activities, it can be hard to ensure that five servings of fruits and vegetables are being consumed. Colleges are notorious for having “all you can eat” buffets filled with deep fried foods and unlimited soda. Vending machines are in every building and filled with high

caloric foods. Many of the snacks that are found in vending machines have added fats and sugars, making them nutrient poor choices and very energy dense (Caruso, 2014). College students who live on campus typically do not have a kitchen to cook and prepare food in. This makes it near to impossible to ensure that the food they are putting into their body is actually high quality, and filled with the nutrients that they need. Research has shown that dining halls heavily influence what on campus students are eating, whether it be positive or negative. On one hand, it has been shown to increase student's intake in fruits and vegetables if they are readily available, but on the other hand if other unhealthy options are easily attainable, the typical student will reach for those (Pelletier, 2013).

In a qualitative study titled "College Students' Barriers and Enablers for Healthful Weight Management" by Mary Greaney, students reported the time constraints they faced when preparing food or working out. All of the food that college students are surrounded with made it hard for them to make healthful choices. They reported not having enough time to go grocery shopping or prepare a healthy meal. However, it can be seen as an enabler because these students reported eating in dining halls that had access to fruits and vegetables and they felt that the college environment was very conducive and supported physical activity. Gyms were readily available for college students and other activities, such as intramural sports, made it easier to get exercise. The physical environment of the campus also made it easy to unknowingly get exercise as they had to walk to all of their classes (Greaney, 2009).

### **Interpersonal**

Social connections are a significant part of the college experience. Making and maintaining close relationships is pivotal for a student's success (Hicks, 2008). "There is a positive relationship between an individual's well-being and their interpersonal relationships" (Salandy, 2011). By going away to college, students often completely start over and make a new identity for themselves. With all of these new choices they have to make, it can be problematic when ensuring that their new identity is representative of their true self.

Students report that social situations play a role in determining what they eat. Male and female college students identified different social pressures they face when going out to eat, or consuming food around friends (Greaney, 2009). On one hand, females spoke how their friends acted as a support system when they wanted to eat in a healthful way, on the other hand males discussed the negative peer influence they were more likely to face when eating out with friends. Both male and female students reported it is easier to remain physically active when they had groups to go workout with (Greaney, 2009).

### **Intrapersonal**

College may increase the level of stress that students must effectively manage. In a study done in 2008 by C.J. Roberts, college women were found to have an increase in poor eating habits when under stress. Another study done by Economos, Hildebrant, and Hyatt found that men and women put on more than five pounds due to stress (2008). Females associated stress with increase portion size and overeating unhealthy foods (Greaney, 2009). College students have to adapt to stressors every day and that can become extremely overwhelming.

Compounding issues, such as roommate troubles, school work, or social problems, can be difficult to manage. Learning how to cope with these struggles is the key to remaining healthy and happy in an environment that at times limits healthy decision making.

Without nutrition or health classes, knowing what foods are considered healthy and what ones are not can be overwhelming. Portion control is important, but most college students report not knowing what a portion size looks like (Greaney, 2009). The intrinsic motivation to exercise especially when there are a number of other things to do that could seem more important is likely not easily found. Finding time to go to the gym is not always a priority for college students.

Cost is a key factor when it comes to choosing foods, especially among college students. The unhealthy foods filled with additives are typically cheaper and easier to find, than the foods packed with nutrients. For a student who is on a budget, it can be hard to justify buying the more expensive food (Greaney, 2009).

Alcohol is a significant problem on college campuses. College students are at a much higher risk for engaging in dangerous behavior. Most of them have never had the freedom to drink excessively and now that they are able to, it can be very detrimental. A 2009 study found that 4,271 students or 67% reported drinking in the past month, and 39% reported restricting food if they were planning on drinking. Not consuming enough calories in order to drink more, can cause severe long term health problems. “Drunkorexia” is a nonmedical term that describes a person who limits their caloric intake and works out excessively in order to justify consuming more calories while drinking (Salandy, 2011).

Eating disorders are increasingly prevalent among college students. Twenty Percent of women and five percent of men reported having some type of disordered eating. Drinking alcohol on an empty stomach severely increases the risk of alcohol toxicity and a greater risk of damaging the brain and organs. It similarly limits the nutrients being taken in which leads to nutritional deficits, and hyperglycemia (Bryant, 2012). Alcohol can also cause students to miss class leading to a lower GPA, engage in risky sexual behavior, alter their brain function, and in severe cases, overdose, which can be potentially fatal. According to the American College Health Association National College Health Assessment Survey, 4.1% of students identified alcohol as being a significant determinant in achieving academic success. (ACHA NCHA II, 2014).

Many students struggle when identifying what a serving of alcohol looks like. In a study done by White in 2003 and 2005, students were asked to pour what they thought was a serving of alcohol into a cup. The average student poured a drink that was much larger than the respected serving. Most students said that a mixed drink with 4.5 ounces of liquor was a serving rather than 1.5 ounces, which would be the standard. When students don't know what a serving of alcohol looks like, they are at risk of unknowingly participating in binge drinking behavior which leads to them underreporting it on surveys (White, 2013). Alcohol is also a source of empty calories which leads to students increasing their caloric intake with "empty calories," or calories that have no nutritional value.

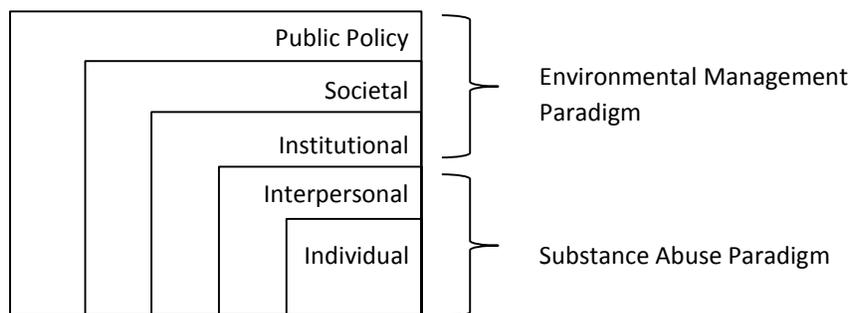
## Methods

This paper will explore what pressures and obstacles they face when deciding what foods they choose, and how they determine their level of physical activity levels. The students will focus in on interpersonal, intrapersonal, and environmental factors that impede their typical choices. The participants will be students that attend the State University College at Brockport. They will be at least 18 years old, and taking at least 12 credits. Participants must be residential students, residing in the dorms. Participants in this study received no incentives, which could have led to a bias of opinion. The institution that this study took place was a liberal arts college located in upstate New York, in a small town with 8,100 residents. In fall of 2014 there 7,040 undergraduates and 1,066 graduates. 49 undergraduate majors and 50 graduate majors are offered. These range from nursing, health and fitness, education, science and art. At the end of our study we will offer ideas on how to improve the student's lifestyles if interested. We will discuss how the health center on campus offers nutrition counseling, along with exercise classes at the gym.

This study will help explain why students make the choices they do in regards to fitness and nutrition behaviors. If we can target the factors that influence a person, we can potentially address the obesity rates on college campuses. By offering alternatives and options for students struggling with either their weight, or their attempts to become healthier, they will hopefully gain the knowledge and understanding on how to make positive lifestyle changes.

This study was framed using Bronfenbrenner's Social Ecological Model in terms of obesity. This is a framework that helps researchers to recognize the factors that influence the

health and wellness of individuals, groups, and populations. (Center for Disease and Control Prevention, 2013). Brofenbrenner describes the levels of influences in terms of micro to macro. The innermost circle represents the individual. This describes the person being affected by all outer layers. This could be the student's knowledge, behavior, or beliefs. The next level of the circle includes interpersonal factors. This is the student's relationships within their peer groups or social circle. This includes their roommates, classmates, friends or family. The third level makes up the institutions or organizations, the community, structures and systems (CDC, 2013).



*Figure 1.* The social ecological model of prevention. Adapted from “A typology for campus-based alcohol prevention: Moving toward environmental management strategies” by W. Dejong and L. Langford, 2002, *Journal of Studies on Alcohol*, 14, p. 141. Copyright (2002) by Alcohol Research Documentation, Inc.

This study utilized a qualitative design due to its exploratory in nature. This design also provided an opportunity to research multiple determinants and levels of influence. By focusing on qualitative data, the researchers were able to generate ideas and interventions that were viewed as significant to the participants in the study. The research consisted of a brief demographic survey created in Qualtrics and then an focus group through Backchannel Chat.

The two focus groups consisted of 4-7 participants and lasted for one hour. Discussion topics were focused on the Social Ecological Model. This study was approved by the Institutional Review Board at The College at Brockport, State University of New York.

**Results**

This study included 11 participants. The average age of participants was twenty years old. The participants consisted of two first year students, three second year students, two third year students, and four fourth year students. There were nine females and two males. Two participants lived in corridor style housing, seven lived in suite style housing, and two lived in student townhomes.

**N= 11**

<b>Mean Age</b>	<b>Males</b>	<b>Females</b>
<b>20 years old</b>	<b>2 participants</b>	<b>9 participants</b>

<b>First Year</b>	<b>Second Year</b>	<b>Third Year</b>	<b>Fourth Year</b>
<b>2 participants</b>	<b>3 participants</b>	<b>2 participants</b>	<b>4 participants</b>

<b>Corridor</b>	<b>Suite</b>	<b>Townhomes</b>
<b>2 participants</b>	<b>7 participants</b>	<b>2 participants</b>

*Figure 2*

Approximately 9% of the students met ACHA’s guidelines for consuming five servings of fruits and vegetables a day. Approximately 27% met the guidelines set by the American Heart Association regarding exercise.

Students reported on where they received most of their physical activity and nutrition education.

High School Health Class	100%
Internet	82%
Magazines	55%
Peers	45%
Campus Programming	36%
Primary Care Physician	36%
Television	36%
Residence Hall Programming	27%
Health Center	27%
Dining Halls	27%
Brochures and Pamphlets	18%

Figure 3

The focus group data was transcribed, coded and analyzed. The analysis yielded the following themes: (a) time limitations, (b) financial limitations, (c) dining hall characteristics, (d) peer influence, (e) campus climate, (f) planning for alcohol use, (g) resident hall environment, (h) educational programming, (i) technology. These themes are discussed in detail in the following section of this manuscript.

### Discussion of Results

This section will outline in detail the barriers and facilitators that the participants in this study faced, as well as give potential interventions.

#### Time

“Understanding Weight Management Perceptions in First Year College Students Using the Health Belief Model,” was a study done to determine the barriers that college student’s face when trying to improve fitness and nutrition behaviors. Students reported a lack of time being a significant barrier. Participants stated that they felt it hard to fit everything into their schedule, when in high school everything was planned for them. Fitting in required coursework centering

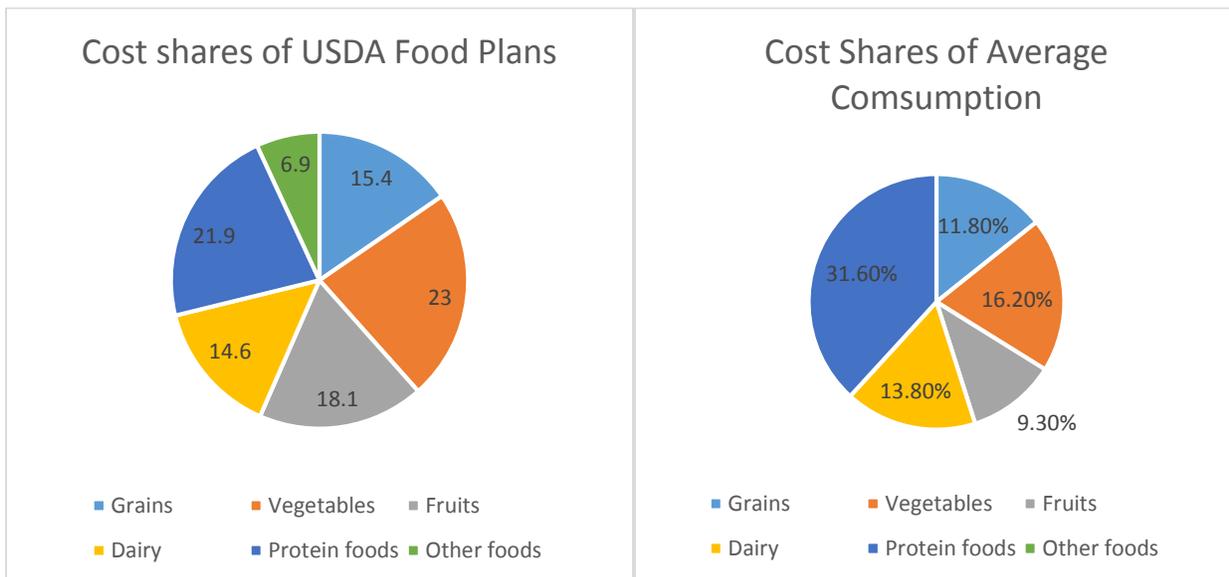
on fitness and nutrition classes could help student's better plan time. Students reported having poor time management skills to be able to find time for exercise (Das & Evans, 2015).

Participants in this study focused on the time limitations and that, they do not have time to prepare healthy foods. Participants described tendencies to grab whatever is quickest, even if it is not the healthiest option. One participant reported, "If I am running around and don't have time to eat a meal, I grab something quick. Most of the time this is prepackaged food with high fat and sugar." This participant was aware of what they were putting into their body, but was more concerned with finding something quick and convenient. Students are confronted with the struggle to balance class, work, their social life, and extracurricular activities. Adding meal prep and exercise on top of that list can be overwhelming and difficult to manage. Another participant reported a lack of motivation. "The amount of motivation and energy I have after a full day of classes and work influences my choices. In terms of healthy eating, it's easier to go for a simple meal that usually isn't the healthiest, rather than put effort into consciously choosing a good meal, based on ease alone."

## **Income**

A report titled "How Healthy is Your Food Budget," outlined ways to eat better while keeping a budget. It highlights the importance of not eating out, and cooking meals at home, eating the same on weekends as during the week, spending one dollar more a day on food to have more available, and increase breakfast, lunch and snack calories by 10%. According to this report, healthy food doesn't have to be expensive if done the correct way (Tufts University, 2015).

The United States Department of Agriculture determines four different food plans to fit the budgets of the consumers. The average American determines what they spend their money on very differently when it comes to nutrition. According to the USDA protein accounts for 32% of the average food spending, and fruits and vegetables only account for 26%. “Other foods” which includes fats, oils, and sweets should only account for 7%, while it actually accounts for 17%. Consumers need to understand where to best put their money when grocery shopping to make the most healthful choices on a budget. This chart shows how much Americans spend on certain foods, compared to what the USDA recommends (United States Department of Agriculture, 2015).



USDA, Economic Research Service using data from the USDA, Center for Nutrition Policy and Promotion.

College students do not have an unlimited income, and healthy foods can be much more expensive than processed, high caloric food that are not energy yielding. One participant

stated, “healthy foods are super expensive and when you have to make money stretch, those \$1.50 donuts sound really good.” Asking a student who has to worry about college tuition, textbooks, and other financial obligations that come with being a college student, to spend extra on more expensive, healthy food, can be a challenging task.

### **Dining Hall Characteristics**

Participants described not feeling comfortable when asking dining hall workers the nutritional information of certain foods being offered. If food is not labeled, students are going to have a difficult time choosing the healthier option. A study titled, “Nutrition Label Viewing during a Food-Selection Task: Front-of-Package Labels vs Nutrition Facts Labels,” found that when foods have nutritional information on the front of the packaging, where it is easy to view, people are more likely to make healthy choices. Use of nutrition information on food labels is associated with lower fat intake, consumption of diets higher in vitamin C and lower in cholesterol, higher fiber and iron intake, and less sugar consumption. In this study 87.5% of participants were able to identify the healthier option when the front of the package was labeled. Being able to view the nutritional information in plain sight is more convenient, and serves as an alternative for people who may struggle with knowing how to read a food label. When catering to the college audience, nutritional information should be easy to read, straight, forward and appealing to look at (Graham, Heidrick, & Hodgins, 2015).

Dining hall characteristics were an important theme when it came to barriers in terms of eating healthy. Dining halls typically try to focus on the “grab and go method” which meets the college student’s needs of time. However, the choices offered are not always the best options. A

participant stated, “with the dining halls, everything is ready to go. At home, you have to make it, which takes more effort and more time, so it’s usually more balanced.” Students may not be as aware of what they are putting in their bodies when they do not cook it themselves. One participant stated, “often they add too much to the food to try to make it taste better. I feel like it’s hard to highlight healthy choices when they add unhealthy things to them.” Participants conveyed the importance of keeping things simple.

Participants also reported struggling with the environment of dining halls. Often times going into an overcrowded area, can be intimidating for people. Not feeling comfortable about having an open dialogue with workers can make it difficult to understand what is considered healthy and what is not. “I’m really shy, so even in the dining hall, I hate talking to people I don’t know. Even the people serving the food. So I stick to the self-serve foods, and yes salad and soup is good, but pizza exists.” Adding nutrition labels that are easy to understand and easily accessible to students will help them to be aware of what they are eating, and be able to make more nutritious choices while easing anxiety.

### **Peer Influence**

College students are very effected by both positive and negative peer influence. If educators and health professionals change the way college students are being taught by incorporating a positive peer influence, students will be more successful when eating healthy and exercising. A study titled, “The Right Bite Program, A Theory-Based Nutrition Intervention at a Minority College Campus,” found this idea to be true. Researchers developed a three year nutrition intervention program. The goal of this study was to increase healthful eating behaviors

among college students through the use of trained student peer educators. Not only did this study incorporate positive peer influence, but it was cost effective by mainly students. As colleges are looking for new programs to implement, cost effectiveness is a core factor. Using resources readily available can cut down on the overall cost, while increasing the success of the program.

Students who were enrolled in the dietetics program were recruited to be student educators. They were role models for the students participating in the study. They were also responsible for leading group presentations, analyzing students' diets, writing columns in the school newspaper, as well as running other nutrition based programs. Focusing on the volunteer aspect of this study was important because it fostered a positive atmosphere for behavior change.

This program was successful in increasing the knowledge as well as increasing the intake of fruits and vegetable consumption, and decreasing fat intake. Going into the study, students had a positive attitude regarding healthy behaviors and wanted to create a change, so there was not a significant change in their behaviors towards eating healthy. Nutrition labels and food descriptions were added to vending machines. Because this study was only measured after a year of implantation, there was not a significant increase in healthy foods in the dining halls. It was thought that if continued, better implementation would occur (Evan & Sawyer-Morse, 2002).

Weight loss interventions typically fail to meet the needs of the individual in terms of autonomous support systems that do not involve a primary care physician. When creating a behavior change, motivation from the individual making the change, needs to be internal. The majority of exercising and eating healthy takes place in the home, or in this case a college campus; having a strong support system consisting of friends and family is critical. College

women identified important figures in their life that helped to increase their autonomy in weight loss interventions. When having someone they can depend on to give them positive reinforcement and increase their desire to lose weight, these women were shown to be more successful. Once a person chooses their own goals, and makes the decision to make a change themselves, the likelihood of them being successful is greatly improved. Family and friends should step back and not offer excessive control. They should focus on acknowledging the person's feelings and thoughts and not be overpowering or controlling (Powers, Koestner, & Gorin, 2008). This particular study was titled: *Autonomy Support From Friends and Family and Weight Loss in College Women*, and focused on self-regulation theory. Being intrinsically motivated is an important aspect when creating a long term behavior change.

Social Norms Theory states that a person will change their behavior based on the social environment and what their peers will do. It was originally used to explain alcohol consumption among students, but can be used to explain how students are influenced by external factors in ways of nutrition and exercise (Carcioppolo & Jensen, 2012). Other people's behaviors and attitudes play an immense role in our everyday life. Prevention is the key to minimize the obesity rates in the United States. College is an important time to establish a positive, healthy relationship with food and exercise. According to the CDC (2015) the dietary and physical activity of children are influenced strongly by their families, peers, communities, and schools. If we can make a strong support system for adolescents, they can take that to college with them and potentially influence their friends to make healthy choices, leading to healthier adults.

Living in such a peer intensive environment, students can struggle with peer pressure. Participants reported experiencing both positive and negative peer influences. College students

are constantly surrounded by other students, especially those who live in residence halls. “We will encourage each other to go to the gym which in this case is good peer pressure. But, then there’s the peer pressure to go to Trax late at night with everyone in my hall.” At this point in a young adult's life, most students are discovering who they are. They want to spend time with their peers and in some cases, this could include things that don’t necessarily help them reach their health fitness goals.

Incorporating forms of peer education maximizing positive peer influence will help students be pushed to make better choices. College students are strongly influenced by the people they are surrounded with. When they surround themselves with people who are not necessarily making healthful choices, it will be difficult for them to make good choices. When students are around peers that value healthy nutrition and fitness lifestyles, they are more likely to see the importance of staying healthy.

### **Campus Climate**

A study labeled, “Institutional Characteristics and the Connection to College Student Health,” looked at what environmental aspects hindered the health of a college population. They found that campus size, the region of the United States that the college was in, whether or not it was religiously affiliated, the campus and community size, and Carnegie classification all had an effect of the overall health of the college population (Oswalt, Lederer & Schrader, 2015).

Campus climate proved to be an important factor when students make their health and fitness choices. “I think the fact that our school is such a health conscious school makes the culture innately pressuring to care about how to treat yourself.” The University that this study

took place, has a strong focus on health based majors such as Public Health and Health Education, Exercise Science, Physical Education, Kinesiology, and Nursing. The institution has numerous award winning health promotion programs and a state of the art fitness facility. Some students found this to be a form of positive peer influence when they were making healthy choices. Others felt it to be intimidating when going to the gym or participating in fitness classes.

### **Alcohol**

Alcohol is an aspect of the college atmosphere, and for many, the life of a student. Students participate in dangerous drinking behaviors for several reasons including using it as a coping mechanism for the stress associated with being a student and the peer influence they face every day. Stress has been increasing in college students over the past decades. According to the social cognitive theory, students learn to deal with stress by watching what the people around them do. When students are placed in an atmosphere where risky behavior is seen as the norm, they are more likely to take part. Nearly 60% of full time college students are classified as heavy drinkers. Problems associated with alcohol can include poor academic performance, injury, unsafe sex, driving while under the influence, and even death (Varela & Pritchard, 2011). When teaching students the dangers associated with drinking, outlining how to handle stress in other ways, such as using exercise as an outlet could minimize the amount of alcohol being consumed. Giving them healthy alternatives and pushing the fact that alcohol is a form of empty calories, could lessen the chances of binge drinking.

Students face the peer pressure to participate in these activities even if it serves as a barrier to healthy choices. Alcohol is packed with empty calories and lowers inhibitions.

Students that may be health conscious routinely, could be at risk for consuming an excessive amount of calories in food and alcohol and become less aware of it. One student discussed how there is a positive atmosphere for healthy choices during the week, but as soon as the weekend hit, students are more concerned about being with friends and drinking. “Monday-Wednesday is pro-healthy peer pressure.” Other students reported changing their diet if they know they are going to be consuming alcohol that night. This can be dangerous and detrimental to the student’s health and wellbeing. Not consuming enough healthy calories and then drinking can lead to alcohol poisoning. Some students think that by replacing healthy calories with calories from alcohol, they won’t have to worry about gaining weight. “I usually try to adjust my diet around drinking. It makes me feel much better when I do, but it’s still not the same as just abstaining. But you are only young once, I guess.” Participants reported that they would attend campus programming centered around alcohol education if the college health professionals made it applicable to them, and gave them incentives. Incorporating alcohol education into nutrition programming by focusing not only on the dangers of binge drinking, but also on the excess empty calories that alcohol has, will potentially help students understand the importance of moderate or complete absence of alcohol consumption.

### **Residence Hall Environment**

In terms of prevention, education is crucial. Residence halls are given a great opportunity to provide students with educational activities, and student’s reported that they would attend them if given the option. With so many students living in one area, looking for something to do with their friends, residence hall directors and health educators can take this opportunity to teach willing students about the importance of healthy fitness and nutritional choices. “More

promotion and education of healthy living, whether it be more programs that are incentivized, or guest speakers who come to campus and promote healthy living.” Several students reported that they would go to an event if they were better advertised and were given an incentive to go. Many activities target students and get them to come by offering food, but it is typically food that is not considered nutritious. This serves as a barrier for students when trying to be healthy. Finding a healthy alternative for students could be just as successful, if not more so.

The residence hall environment plays an enormous role in whether or not students are making healthy fitness and nutrition behaviors. College students are very impressionable. They are living in an area where they are constantly surrounded by people. Other’s views and ideas can shape what a student believes. “I tend to eat healthier at home. I guess college, between the dorms and dining halls is a bit of a free for all.” Participants also reported that the set up of resident halls do not necessarily have the health of students in mind. “...the way the residence halls are set up, with the bathrooms/all water sources at either end of the hall, it is hard to ensure I am drinking enough water throughout the day, especially as an athlete.” When students do not have easy access to things such as water, they are more likely to go the vending machine filled with high sugar sodas and juice. Colleges must address access issues and provide convenient, healthy choices.

### **Educational Programming**

The 2013 National College Health Assessment, showed that 50% of students reported wanting more health education opportunities. Health professionals need to develop more techniques to reach, educate, and inform students on how to change their health behaviors.

Health classes are a great way to increase a student's knowledge on fitness and nutrition choices. Most students receive their last health class in high school, and are unlikely to retain that information all throughout their college career. Requiring students to take a health class and giving them the incentive of receiving a credit will help them gain knowledge and improved self-awareness. College is an important time for students because they are likely going to develop habits that stay with them. A required health class would seem just as important as a math class or english class.

Participants in this study discussed that they were not aware of any resources that their campus offered regarding fitness and nutrition choices. When implementing new programs or continuing with old ones, advertising through technology and offering incentives seems to be the best way to get students to respond. Residence halls are a great way to promote programs as well as serve as a way to implement them. If students are unaware of what is being offered to them, or are not knowledgeable on the topic, they are unlikely to respond.

Focusing on the student population's health does not only benefit the individual student, but it will benefit the campus as a whole. Students who are active and take in healthy foods, are shown to be more successful academically (CDC, 2010). Colleges need to focus their attention on the student's health, especially if they want to increase their job placement rates among graduating students. Health and productivity have a positive correlation. As health and happiness increase, so does the quality of work and in turn, greater chance of having a job post-graduation. Employers set up incentives to increase the health of their employees, colleges should be following the same ideals. If college's found ways that their students could receive immediate

benefits for participating in healthy lifestyle choices, academic performance would increase dramatically

Students reported educational programs stressing the intrinsic value of exercise and healthy eating. It may be good for the body, heart, and lungs, but it also benefits the mind. “I feel like creating more awareness about how important exercise is not just for physical health, but also for mental health to just take a break from work.” Students face a great deal of stress and exercise can be a great tool to battle the problem. It serves as an outlet for people and many reported feeling much better after exercise.

### **Technology**

It is imperative to form interventions around the needs of college students. In a study titled, “Using Facebook and Text Messaging to Deliver a Weight Loss Program to College Students” by Napolitano, Hayes, Bennett, Ives, and Foster, researchers divided participants into three groups. One group was labeled “Facebook.” This group received an invitation to join a private Facebook group which allowed them to receive updates, recipes, weight loss and exercise tips. The next group was labeled “Facebook Plus.” This group was also given access to the private group, but they received text messages that gave them feedback and support throughout the study as well. The last group was the waiting list group. At the end of eight weeks, the Facebook Plus group showed a greater amount of weight loss than the other two groups (-2.4±2.5kg.) Both the Facebook and the Facebook Plus group reported acceptability and felt the intervention was helpful for them. 100% of the students said that they would recommended it to a friend.

Finding an intervention that not only fosters positive change, but that is also accepted by students is the key to meeting the goals. The cultural aspect of college students lives revolve around technology, and social media. This intervention increased physical activity, and weight loss self-efficacy. It provided a social support aspect by asking students to identify a friend who would congratulate them when they made positive, healthy choices (Napolitano, Hayes, Bennett, Ives, & Foster, 2013).

Participants really focus on the importance of technology. The majority of students own a computer or smart phone and use the internet several times a day. Our demographic study found that well over half of the students in our study received fitness and nutrition information from the internet. Meeting the needs of students and giving them the resources they need through technology can be an important tool. "...the phone apps are helpful in providing personalized information to keep you on track. They are the most useful tool." Students reported that they relied on phone apps or tracking devices to monitor their food and exercise habits.

According to the Pew research center, nearly 100% of undergraduate and graduate college students reported to using the internet (2010). A chart based on information collected from the Pew Research Center shows just how connected students really are.

### Connected college students

Percentage of American adults in each group who use the internet, have broadband at home, and connect wirelessly

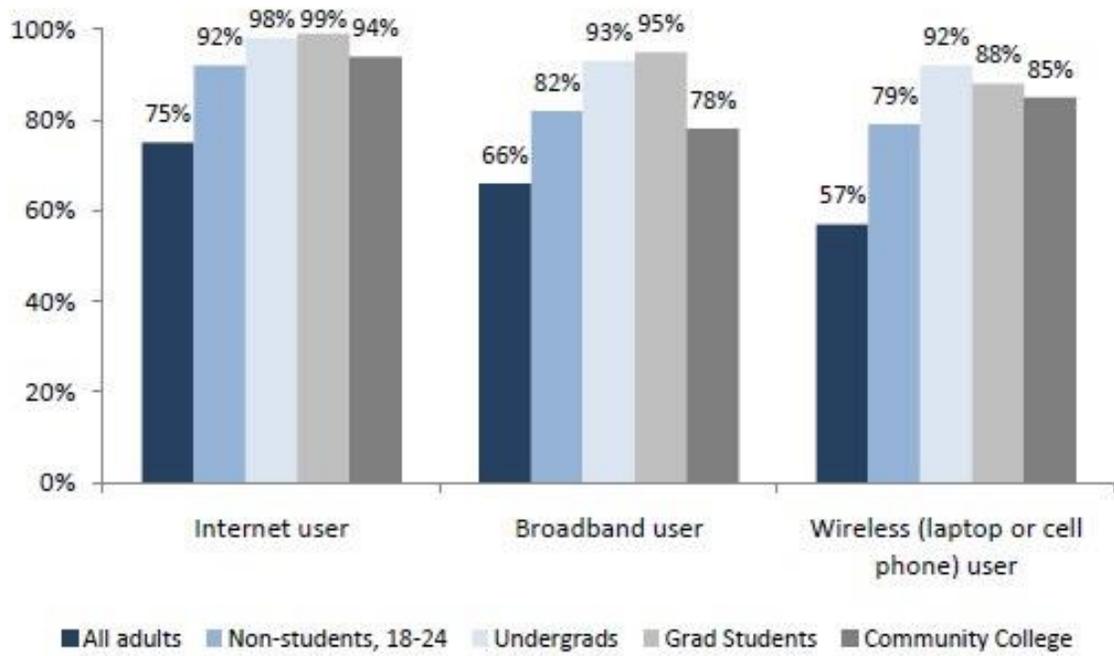


Figure 5. Pew Research Center’s Internet & American Life Project 2010 tracking surveys.

Students reported the importance of having easy to use, and convenient phone applications right at their fingertips. Having a program where they would have to wait to enter their data until they got to a computer, would not work with their lifestyle. There are several factors that influence whether or not college students are making healthy choices. When finding interventions, it is essential that educators and health professionals keep the needs of the student population in mind. As students are using technology more and are constantly connected, having

a program that meets their busy lifestyle and supports technology use can be beneficial to both the students and the goal of increasing the health of students.

The participants in this study discussed how they appreciated the online version of a focus group. This really met the convenience and technology need for the participants. When the average student spends an increasing amount of time connected to a mobile device or computer, meeting their needs is the best way to induce a behavioral change. Social media is becoming increasingly more popular in all populations, including college students. The typical student has an app on their phone for Facebook, Twitter, Instagram, and Snapchat. Forty-five percent of smart phone users are college aged and 80% of the time spent on smartphones is within applications (Miller, Chandler, & Mouttapa, 2015). Formatting intervention strategies and programs through one of these platforms is not only appealing for the cost effective aspect, but also for the convenience and the ability to save time.

The obesity rates among college students is growing and is becoming a major public health issue (Nelson, Gortmaker, Subramanian, Cheung & Wechsler, 2007). When combatting this disease, it is important to look at what college health professionals and administrators can do to help students increase their health. Focusing on the barriers they face, such as time and money along with the enablers including technology and peer influence, is crucial when developing interventions. Providing students with the knowledge on how to make healthy choices will benefit not only the individual, but the campus as a whole.

### **Limitations**

This study focused on the interpersonal, intrapersonal and environmental barriers and enablers that residential college student's face. Improvements could have been made by increasing the sample size. Several students reported that they preferred an online focus group because it was more convenient and they were able to be more open with their feelings and opinions. Others said that it was hard to have a real conversation, and it would have been easier if it was conducted in person. Although the majority of students did not meet the dietary and fitness guidelines regularly, most of them had positive views on healthy fitness and nutritional behaviors. The college that this study took place has a strong view on fitness and nutritional lifestyles. Several participants felt that it is a very health conscious school, potentially due to the fact that many of the majors focus on health promotion, as well as having a state of the art fitness facility.

### **Further Research**

Further research should be conducted to determine interventions to better meet the needs of the college student population. Interventions could be tested to see the success rate and if there is a significant behavior change regarding fitness and nutrition choices. Researchers could determine which intervention is the most successful and creates the strongest positive change. As technology changes, so will the methods of intervention. There is a need to continue focus on technology and improving it as the times change to monitor if the positive behavior change will remain constant. Researchers could determine if labeling meals in the dining halls, as well as offering more healthy options, would increase the health of college students. Offering a more

conducive environment for students to be able to make healthy choices could have a positive correlation.

### **Conclusion**

This study showed that students face several barriers including time, money and their environment when they try to make healthy choices. Students reported the importance of technology and peer influence in their everyday life. When implementing interventions, it is pivotal to incorporate all areas. College students are faced with multiple challenges every day, and the ability to make fitness and nutritional choices should not be one of them. Creating a positive environment that stresses the importance of a healthy lifestyle as well as supplying students with the knowledge, time, and ability to make healthy choices, will become a lifestyle change that they can carry with them for the rest of their lives, and potentially improve the health of others. Healthy lifestyle choices and academic achievement has a positive correlation. If colleges want their students to be as successful as possible and have the highest job placement rates, then a stronger focus on nutrition and fitness education is critical. Students develop habits in college that they will continue throughout their lives. With obesity being one of the leading causes of death in the United States, college students are the perfect population to target to improve the health of the population as a whole.

## References

- American College Health Association. (2014). *National college health assessment report*. Hanover, MD:
- Bryant, J., Darkes, J., Raphal, C. (2012). College students' compensatory eating behaviors in response to alcohol consumption. *Journal of American College Health, 60*, 350-6.
- Carcioppolo, N., Jensen, J. (2012). Perceived historical drinking norms and current drinking behavior: using the theory of normative social behavior as a framework for assessment. *Health Communication, 27*, 766-775.
- Center for Disease Control and Prevention, 2015; Heart disease facts.
- Center for Disease Control and Prevention, 2010; The association between school-based physical activity, including physical education, and academic performance.
- Center for Disease Control and Prevention, 2015; The Social-Ecological Model: A Framework for Prevention.
- Das, B., Evans, E. (2015). Understanding weight management perceptions in first year college students using the health belief model. *Journal of American College Health, 62*, 488-497.
- Dejong, W., Langford, L. (2002). A typology for campus-based alcohol prevention: Moving toward environmental management strategies. *Journal of Studies on Alcohol, 14*, 141.

- Evans, A., Sawyer-Morse, M. (2002). The right bite program: a theory-based nutrition intervention at a minority college campus. *Journal of American Dietetic Association, 102.3*, 89-93.
- Graham, D., Heidrick, C., Hodgins, K. (2015). Nutrition label viewing during a food-selection task: front-of-package labels vs nutrition facts labels. *Journal of the Academy of Nutrition and Dietetics, 115*. 2040, 1636-1646.
- Greaney, M. L., Less, F. D., White, A. A., Dayton, S. F., Riebe, D., Blissmer, B. (2008). College students' barriers and enablers for healthful weight management: A qualitative study. *Journal of Nutrition Education and Behavior, 41*, 281-286.
- Hicks, T., Heastie, S. (2008). High school to college transition: a profile of the stressors, physical and psychological health issues that affect the first- year on- campus college student. *Journal of Cultural Diversity, 15*, 143-147.
- Kolodinsky, J., Green, J., Michahelles, M., Harvey-Berino. (2008). The use of nutritional labels by college students in a food- court setting. *Journal of American Health, 3*, 297-301.
- L. Caruso, M., Klein, E., Kaye, G. (2014). Campus- based snack food vending consumption. *Journal of Nutrition Education and Behavior, 46*, 401-405.
- Napolitano, M. A., Hayes, S., Bennett, G. G., Ives, A. K. and Foster, G. D. (2013), Using facebook and text messaging to deliver a weight loss program to college students. *Obesity, 21*: 25–31.
- Nelson, T., Gotymaker, S., Subramanian, S., Cheung, L., Wechsler, H. (2007). Disparities in overweight and obesity among us college students. *American Journal of Health Behavior, 31*,363-373.

Nichols, L., Yang, T. (2011). Obesity and health system reform: private vs. public responsibility.

*Journal of Law Medicine and Ethics*, 39.3, 380.

Oswalt, S., Lederer, A., Schrader, L. (2015) Institutional characteristics and the connections to college student health. *American Journal of Health Behaviors*, 39, 475-486.

Pelletier, J., Graham, D., Laska, M. (2014). Social norms and dietary behaviors among young adults.

*American Journal of Health Behavior*, 38, 144-152. 8

Powers, T., Koestner, R., Gorin, A. (2008). Autonomy support from friends and family and weight loss in college women. *Families Systems and Health*, 26, 404-416.

S. Salandy. (2013). The effect of physical activity and nutrition on the stress management, interpersonal relationships and alcohol consumption of college freshmen. *College Student Affairs Journal*, 31, 69-76.

Smith, A., Rainie , L., Zickuhr, K. (2011, July 19). *College students and technology*.

Tufts University. (2015). How healthy is your food budget? *Health and Nutrition Letter*.

United States Department of Agriculture, 2015 Following Dietary Guidelines Need Not Cost More- But Many Americans Would Need to Re-Allocate Their Food Budget.

Varela, A., Pritchard, M. (2011). Peer influence: Use of alcohol tobacco and prescription medications.

*Journal of American College Health*, 59, 751-756.

White, A., Hingson, R. (2013). Excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*, 35, 201-218.

**Tables**

Table 1

The Social Ecological Model of Prevention

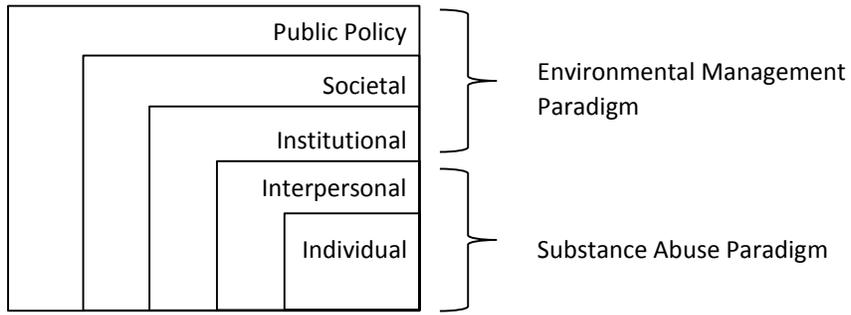


Table 2

Results

N= 11

<b>Mean Age</b>	<b>Males</b>	<b>Females</b>
<b>20 years old</b>	<b>2 participants</b>	<b>9 participants</b>

<b>First Year</b>	<b>Second Year</b>	<b>Third Year</b>	<b>Fourth Year</b>
<b>2 participants</b>	<b>3 participants</b>	<b>2 participants</b>	<b>4 participants</b>

<b>Corridor</b>	<b>Suite</b>	<b>Townhomes</b>
<b>2 participants</b>	<b>7 participants</b>	<b>2 participants</b>

Table 3

## Results

High School Health Class	100%
Internet	82%
Magazines	55%
Peers	45%
Campus Programming	36%
Primary Care Physician	36%
Television	36%
Residence Hall Programming	27%
Health Center	27%
Dining Halls	27%
Brochures and Pamphlets	18%

Table 4

Cost Shares of USDA Food Plans Compared to Average Consumption

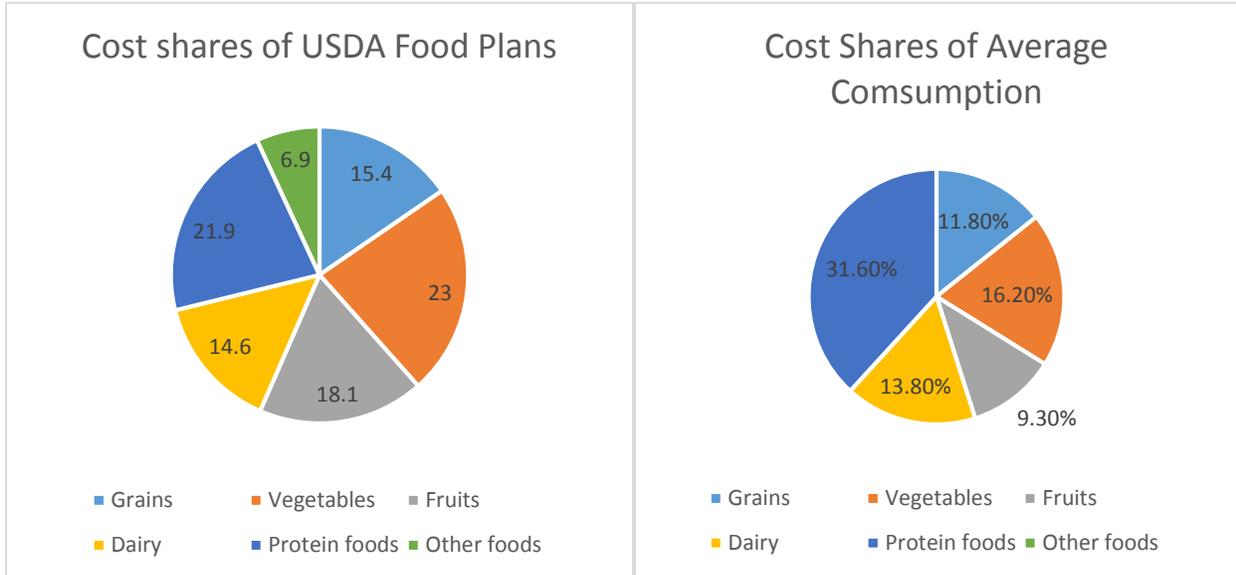


Table 5

Connected College Students

### Connected college students

*Percentage of American adults in each group who use the internet, have broadband at home, and connect wirelessly*

