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Physical Activity and Nutritional Behavior of College Students Trying to Lose Weight

by

Santino Vallejos, M.S.

A thesis submitted to the graduate faculty in partial fulfillment of the  
requirements for the degree of  
Master of Science in Exercise Science

Kinesiology Department

STATE UNIVERSITY OF NEW YORK – COLLEGE AT CORTLAND

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## ABSTRACT

Although there are numerous benefits to increased physical activity and proper dietary behaviors, the decreased participation in physical activity and poor dietary behaviors has emerged as a significant problem within the college student population. The focus of this research study was to identify the relationship between physical activity and dietary behavior to weight loss behaviors within an undergraduate student sample of a small, comprehensive northeastern university. College-aged students (age range: 17 to 27 years old) completed the American College Health Association's (ACHA) National College Health Assessment II (NCHA) during the years 2009 and 2012. According to the results, there were no significant relationships between the predictor variables (Gender, Fruit/Vegetable intake, Moderate to Vigorous Physical Activity (MVPA)) and weight loss behaviors. The results from the regression analysis suggested that there were no significant differences between weight loss behaviors within the variables of fruit and vegetable intake ( $p = 0.25$ ) or MVPA ( $p = 0.25$ ). The one predictor variable that did express a significant relationship to weight loss behavior was Gender ( $p < 0.001$ ), suggesting that there was a significant association with weight loss behavior within the female vs. male gender. These findings suggest that women more so than males report a higher likelihood of wanting to lose weight, but common weight loss methods were not significantly different between male and female respondents.

## ACKNOWLEDGEMENTS

Thank you to my thesis committee, Dr. Erik Lind, Dr. John Foley, and Dr. Peter McGinnis. Thank you to my wife, Ashlea Vallejos, for being supportive and incredibly patient throughout my educational career.

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## CHAPTER 1

### INTRODUCTION

Obesity continues to be a critical issue worldwide in both underdeveloped countries as well as industrialized countries such as the United States. According to the Centers for Disease Control (CDC), nearly 36% of adults in the United States were obese during the 2009-2010 data collection period (Ogden et al., 2012). During this same period, 18.4% of adolescents between the ages of 12 to 19 years could be classified as obese (Ogden et al., 2012). Closer examination of obesity figures from various national surveillance assessments suggests that this trend has remained stable over the past decade (National Health and Nutrition Examination Survey [NHANES]; Behavioral Risk Factor Surveillance System [BRFSS]).

The severity of the epidemic is underscored when various disease states associated with obesity are considered. This increase in excessive levels of adipose tissue has detrimental effects on an individual's overall health and specific bodily function. National programs, such as the Obesity Educational Initiative sponsored by the National Heart, Lung, and Blood Institute (NHLBI), have noted the association of obesity with increased morbidity and mortality if left untreated (National Institutes of Health [NIH], 1998). Examples include, but are not limited to, certain cancers, hypertension, cardiovascular disease such as coronary heart disease, and metabolic disturbances such as diabetes (Al-Rethaiaa et al, 2010). Collectively, the Office of the Surgeon General estimates that obesity is related to nearly 112,000 preventable deaths on an annual basis (United States Department of Health and Human Services [DHHS], 2010).

Compounding the situation is the financial cost that is associated with obesity. The result is a substantial increase in medical care and disability costs. Specifically, when compared with normal weight individuals, those classified as obese see a 42% (~\$1492) increase in medical spending (Finkelstein et al., 2009). On a national level, over \$99 billion was spent in the fiscal year 1995 to account for direct costs related to obesity. Moreover, over half of that amount was spent on direct medical costs (NIH, 1998).

Currently, there are a number of treatment options for obesity, including dietary therapy, behavior modification, pharmacotherapy, and even surgical interventions such as gastric bypass (Auvichayapat, 2008; NIH, 1998). Although these all reflect relatively effective treatments, the most commonly utilized treatments in society is dietary therapy and exercise programming. The efficacy of these treatments was summarized in the Obesity Educational Initiative (NIH, 1998). Specifically, dietary therapy (e.g., low-fat diets) was recommended as a means of reducing caloric intake in overweight and obese individuals and was deemed a suitable method for weight loss. Similarly, exercise was found to also induce weight loss independent of that observed with diet.

In light of the prevalence of obesity in the United States, the severity of the disease and associated costs, and arguably simple methods for weight management, it stands to reason that an ideal population to target for health promotion is college students. As ideal as this population might seem, however, evidence exists that portrays a very different picture. Notably, of the 15 million individuals who are enrolled in an institution of higher learning, 35% are either overweight or obese (West et al., 2012). This fact is corroborated when considering studies that demonstrate that fewer college-aged students reported engaging in vigorous physical activity compared to high school-aged students

(Nelson et al., 2007). Of those attempting weight losses, Lowry et al. (2000) found that students trying to lose weight were more likely to participate in vigorous physical activity and resistance training exercises and eat a low-fat diet. Moreover, only 54% of females and 41% of males used a combination of both exercise and diet to lose weight. Weight management is not the only benefit experienced. VanKim and Nelson (2013) noted in a sample of 14,804 undergraduate students that those who reported meeting vigorous physical activity guidelines were more likely to report both better mental health and less perceived stress.

Within our recent history, young Americans are now confronted with the possibility that life expectancy or quality of life for our current and future generation(s) will decrease. Unfortunately, this possibility has the ability to become a reality, due to the foreshadowing role of the obesity epidemic. Obesity, regardless of its adverse implications on the human being, it has become an almost form of adaptation that has been shaped by our environment and culture in which the balance has shifted to a high level energy intake to low energy expenditure. Food is now becoming less expensive due to the agricultural evolution and economic advancements of our time. And because of this, food is now served in portions much higher than the current recommended daily allowances (RDA) and thus support the adage that “more is better”. And along with food, the human population has invested their time making lives more efficient and time saving, resulting in most of their days spent sitting. This adaptation or evolutionary step into obesity can be best observed within the college population.

With stressors such as body image issues, time constraints, newly formed responsibilities, and the onset of new technologies, college students are turning to quick

high calorie foods to accommodate for their meal, as well as using unhealthy foods and beverages such as fast food or alcohol to cope with all the nuances of early adulthood. Unfortunately, along with increased food intake, there is a decrease in physical activity. Although higher educational institutions are enacting programs and interventions to win the battle against obesity, very little progress has been made to attempt to control and or prevent the increasing rates of obesity (Sira & Pawlak, 2010). In summary, obesity remains a major and costly health threat worldwide. Interventions are needed to address the problem at different levels and across all populations. One such population to target, given the circumstances that surround this unique group, is college students. However, continued research is required to more fully understand the relationship between popular weight management practices and healthy lifestyle behaviors in this population.

### **Statement of the Problem**

The purpose of the proposed study is to investigate the relationship between (a) physical activity behavior and (b) dietary behavior in a sample of college-aged students trying to lose weight from a small, comprehensive northeastern college.

### **Research Questions**

In terms of statistical modeling, what is the:

(a) Relationship between dietary practices and desire to lose weight in a college-aged sample, and

(b) Relationship between physical activity practices and desire to lose weight in a college-aged sample?

### **Significance of the Study**

Each year, many high school graduates transition into a new, unfamiliar college environment. New responsibilities and demands add to the stress of being away from home and the immediate family support system. This stress may, in turn, result in college-aged students engaging in poor lifestyle changes, such as making poor dietary choices and reducing time spent engaging in physical activity. Unfortunately, these choices can result in weight gain with the unintended outcome of falling into the categories of overweight or obese. If not addressed, these can turn into lifelong habits that only put the individual at risk for more severe chronic diseases later in life.

Thus, the significance of this study is to provide a better understanding of the relationship between dietary and physical activity behaviors to desire to lose weight and overall well-being in college students. The findings from this study have the potential to impact health promotion practices and curriculum on campuses nationwide.

### **Limitations**

- Participants' perception of healthy practices is based on personal experience.
- No causal relationship can be established.
- Sample is not representative of the larger United States college student population.
- The consistency and accuracy of self-reporting by students.

### **Delimitations**

- Sample is comprised of undergraduate students from a small, comprehensive northeastern college during the 2009 and the 2012 academic years.

- This is a secondary analysis of a pre-existing data set from the American College Health Association National College Health Assessment II survey.
- Student-athletes who compete in a sanctioned National Collegiate Athletic Association sport are not included in the analyses.

### **Assumptions**

- All participants provided complete and accurate responses.
- All responses were scored correctly.
- All data comes from American College Health Association National College Health Assessment II survey.

### **Summary and Rationale**

The rationale of this study is to provide a better understanding of the relationship between dietary and physical activity behaviors to the desire to lose weight and overall well-being in college students. The findings from this study have the potential to impact health promotion practices and curriculum on campuses nationwide.

### **Definition of Terms**

Physical Activity (PE): “Physical activity is any body movement that works your muscles and requires more energy than resting. Some examples are: walking, running, dancing, swimming, yoga, and gardening”. (<https://www.nhlbi.nih.gov/health/health-topics/topics/phys/>)

MVPA: Moderate/Vigorous Physical Activity. Combined values of moderate and vigorous physical activity reported within the National College Health Assessment II (NCHA).

Obesity: A condition characterized by the excessive accumulation and storage of fat in the body.

(<http://www.cdc.gov/obesity/adult/defining.html>).

Recommended Dietary Allowance (RDA) The amount of an essential nutrient, as a vitamin or mineral, that has been established by the Food and Nutrition Board of the National Academy of Sciences as adequate to meet the average daily nutritional needs of most healthy persons according to age group and sex. (<http://medical-dictionary.thefreedictionary.com/RDA>).

## CHAPTER 2

### REVIEW OF LITERATURE

#### **Obesity – Prevalence, Health and Financial Impact, and Treatment**

Obesity continues to be a critical issue worldwide in both underdeveloped countries as well as developed countries such as the United States. According to the most recent study by Al-Rethaiaa et al. (2010), obesity is defined as the accumulation and storage of adipose tissue at excessive levels. According to the Centers for Disease Control (CDC), nearly 36% of adults in the United States were obese during the 2009-2010 data collection period (Ogden et al., 2012). During this same period, 18.4% of adolescents between the ages of 12 to 19 years could be classified as obese (Ogden et al., 2012). Closer examination of obesity figures from various national surveillance assessments suggests that this trend has remained stable over the past decade (National Health and Nutrition Examination Survey [NHANES]; Behavioral Risk Factor Surveillance System [BRFSS]). For example, state-specific data from the BRFSS indicates that 37% and nearly 24% of New York residents, respectively, were classified as overweight and obese in 2012. Locally, 29.8% of adults residing in Cortland County were classified as obese in 2009. In response, the State of New York Health Department has set a goal of reducing the local obesity rate by 6 percentage points by 2017.

The severity of the epidemic is underscored when various disease states associated with obesity are considered. This increase in excessive levels of adipose tissue has detrimental effects on an individual's overall health and specific bodily function. National programs, such as the Obesity Educational Initiative sponsored by the National Heart, Lung, and Blood Institute (NHLBI), have noted the association of obesity with



increased morbidity and mortality if left untreated (National Institutes of Health [NIH], 1998). Examples include, but are not limited to, certain cancers, hypertension, cardiovascular disease such as coronary heart disease, and metabolic disturbances such as diabetes (Al-Rethaiaa et al., 2010).

Compounding the situation is the financial cost that is associated with obesity. The result is a substantial increase in medical care and disability costs. Specifically, when compared with normal weight individuals, those classified as obese see a 42% (~\$1492) increase in medical spending (Finkelstein et al., 2009). On a national level, over \$99 billion was spent in the fiscal year 1995 to account for direct costs related to obesity. Moreover, over half of that amount was spent on direct medical costs (NIH, 1998). Locally, using hypertension, of which obesity contributes, as an example, the mean financial cost was between \$6,152 for minor to \$20,133 for major elevated blood pressure (State of New York Health Department, 2009).

Currently, there are a number of treatment options for obesity, including dietary therapy, behavior modification, pharmacotherapy, and even surgical interventions such as gastric bypass (Auvichayapat, 2008; NIH, 1998). Although these all reflect relatively effective treatments in terms of weight loss, the most commonly utilized treatments in society is dietary therapy and exercise programming. The efficacy of these treatments was summarized in the Obesity Educational Initiative (NIH, 1998). Specifically, dietary therapy (e.g., low-fat diets) was recommended as a means of reducing caloric intake in overweight and obese individuals and was deemed a suitable method for weight loss. Similarly, exercise was found to also induce weight loss independent of that observed

with dieting. Collectively, the ease with which these treatments can be implemented adds to the appeal.

### **Obesity – College-Age Population**

The prevalence of obesity in the world is increasing every year. In the United States alone, the prevalence of obesity within adults is at an extraordinary 35.7%, at almost one third of the adult population in the country (Centers for Disease Control and Prevention [CDC], 2012). As individuals transition from late adolescence to early adulthood, the rate of obesity increases as a result of factors such as changes in behavioral and eating habits that are facilitated by major milestones, in particular, matriculation in college (Desai, 2008). This change in one's social environment, however, is rife with potentially risky lifestyle temptations. "The transition from high school to college may be such a critical period because it is associated with many lifestyle changes that can lead to weight gain, such as changes in eating habits and increased alcohol intake" (Anderson, et al. 2003).

College students, unfortunately, are highly susceptible to the condition of obesity. Due to their abnormal eating habits and behavioral changes, college students are more prone to participate in behavior that often leads to excessive weight gain. Although obesity discriminates no individual, studies seem to suggest that certain groups might be more at risk for obesity, such as males (Al-Rethaiaa et al., 2010; Huang et al., 2003; Nelson et al., 2007) and certain ethnic groups (Nelson et al., 2007). As stressors, responsibilities, and social obligations increase, many college students are faced with the task of prioritizing behaviors, ultimately leading to a decrease in physical activity and poor nutritional intake. "Many college students practice unhealthful lifestyles, placing

them at risk for developing serious health problems” (Brunt & Rhee, 2007). More specifically, the overwhelming component that creates the biggest detriment to student health is the failure to follow a healthy dietary program. According to Brunt and Rhee (2007), the nutritional component is critical and is associated with 50% of the leading cause of death in the country.

### **College Students and Physical Activity**

For young adults, college is the next step into adulthood. The introduction of new responsibilities and environments allow the individual a sense of independence. But as this sense of independence is acquired, priority of the incorporation of physical activity is left at the bottom of the list. Physical activity is any body movement that works your muscles and requires more energy than resting. Some examples are: walking, running, dancing, swimming, yoga, and gardening” (<https://www.nhlbi.nih.gov/health/health-topics/topics/phys/>). The research within this age group is still emerging and although the longitudinal data is limited, the data that is present still exhibit a drastic and noticeable change in behavioral habits pertaining to physical activity. According to Nelson et al., (2008), young adults fail to adhere or meet national guidelines for physical activity falling at an incredible 12.7%. According to Buckworth and Nigg (2004), a small percentage of college students totaling of 18%, are participating in some form of physical activity at an average of five or more days within a given week, while a larger percentage at 23% percent (57% of males vs. 61% of females) reported to only have participated in physical activity three of the seven days of the week. Interestingly, a five-year longitudinal study observed that there are gender differences between the declines of physical activity:

“Findings showed longitudinal changes in moderate to vigorous physical activity, particularly among girls (decreasing from 5.1 to 3.5 hrs/week aged from 16 to 20 years), and leisure time computer use, particularly among boys (increasing from 10.4 to 14.2 hrs/week aged from 16 to 20 years)” (Nelson, et al. 2008).

The decrease of non-existence of physical activity has detrimental effects on the physical and psychological components of the individual. In recent studies, sedentary practice has been associated with unhealthy behavioral patterns within college students that include but are not limited to binge drinking, drug use, and risky sexual activities (Dinger et al., 2014). The incorporation of physical activity has been observed and studied as a contributing factor to healthy behavioral patterns that promote overall wellness. In one study by Dinger et al. (2014), the presence or participation of physical activity by college students facilitated what are called *protective behaviors* in the form of appropriate and adequate intake of daily of fruits and vegetables as well as a decreased use of tobacco and consistent seatbelt use. Psychological implications via physical activity manifest themselves by decreased suicidal ideations and behaviors as well as fewer depressive episodes.

Although many college students are living this sedentary lifestyle, many colleges have and are attempting to change the direction of this sedentary increase, by promoting exercise intervention. As a solution to the sedentary/obesity epidemic, colleges are focusing on the importance of exercise programs. Although athletic programs such as collegiate level sports are existent and do promote physical activity, organizations such as recreational sport activities outside of collegiate sport (Kilpatrick et al., 2004). Exercise

interventions are also shifting from an exercise model that consisted of intense and structured exercise to more functional and structured around one's lifestyle (Kilpatrick et al., 2004). Furthermore, after analysis of data by Kilpatrick et al. (2004), the motives for sport and exercise participation by college students are defined by these components: competition, affiliation, enjoyment, and challenge. These all fall under the realm of both extrinsic and intrinsic motivating factors which play a key role in keeping college students healthy and disease free.

According to current data, regular physical activity facilitates improvement in both physiological and psychological health (Kilpatrick et al., 2005). By understanding this, one would logically come to the understanding that participating in physical activity is important and would be a norm. However, this does not appear to be the case.

According to recent data, the levels of physical activity with young adults decrease as the transition from high school to college occurs (Kilpatrick et al., 2005). Evidence shows that physical activity participation, in fact, declines, which ultimately translates to patterns of activity that is not adequate for the improvement of health and fitness and results in weight gain. In relation to specific numbers, approximately 38% of college students participate in adequate activity patterns, while only 20% participate in moderate activity (Kilpatrick et al., 2005). In contrast, prior to college, high school students reported to be participating in adequate activity at 65% and moderate activity at 26%. More alarming are studies that suggest one out of every six college students report no days of aerobic activity; one out of every three report no resistance training exercise; and less than 1% report participating in a physical education course (Huang et al., 2003).

## **Diet Practices**

Along with the decrease in adequate levels of activity, most college students fail to achieve the nutritional habits that encourage healthy weight management. College students typically consume diets high in fat, sugar, and sodium instead of diets that are rich in fruits and vegetables. Ultimately these poor eating habits consequently ends with the increase of snacking, excess dieting, and the ingestions of energy dense foods versus nutrient dense foods. Healthy dietary practice continues to be an important component to healthy living. Due to the availability and economic shift of how food is now acquired and processed, rate of unhealthy dietary behavior increases. Factors such as availability, cost, culture, environment and other biological factors affect eating behaviors. Recent research suggests that dietary wellness is at a steady decline, shifting towards a trend of unfavorable behavioral activity (Nelson et al., 2008). According to Continuing Survey of Food Intakes by Individuals, fast food consumption is highest in young adults between the ages of 20-39 years old at an astounding 52% (Nelson et al., 2008). Along with fast food intake, within the same data set, the research suggested that soft drink intake was also highest among young adults within the same age group, specifically 63% in males and 59% in females.

Of the 15 million individuals who are enrolled in an institution of higher learning, 35% are either overweight or obese (West et al., 2012). With the low cost of unhealthy foods and their increased levels of convenience, many college students turn to these high calorie foods that contribute to the obesity epidemic (Gerend, 2008). Although the meal plans that are available to all college students attempt to create healthier eating behaviors, a majority of college students still are deficient in important core food groups such as

fruits, vegetables, and dairy products (Brunt & Rhee, 2007). Huang et al. (2003) observed that almost 70% of college students surveyed reported < 5 servings of fruit and vegetables per day. Instead, dietary choices of college students are primarily high in fats, sodium, and sugars (Brunt & Rhee, 2007). It is interesting to note that in a sample of college students who reported trying to lose weight, a common practice was to consume  $\geq 5$  servings of fruit or vegetables and  $\leq 2$  servings of high-fat food (Lowry et al., 2000). Moreover, Desai et al., (2008) documented an 11 percentage point difference between normal weight and overweight/obese college students on their desire to be thinner. This same study also noted that 27% and 45% of those classified as overweight/obese reported frequent dieting attempts and no physical activity, respectively. Along with diet, consumption of alcohol shows a steady increase with college students between the ages of 20 to 30 years old consuming more alcohol than non-college students (Brunt & Rhee, 2007).

Along with unhealthy food choices, intake of beverages that are high in sweeteners are also contributing factors to weigh gain in college students. In a recent study by West et al., (2012), intake of soda and other high sugar beverages has been linked to the increased rates of obesity within children and adolescence. Due to high levels of consumption of these beverages within this specific population, over 20% of total energy consumption come from these beverages alone, which ultimately translates to a total of ten percent of total calories consumed (West et al., 2012).

In conclusion, during the past two decades, the increase in the rate of obesity has become more prevalent and needs to be addressed. Numerous studies on the subject matter not only implicate this epidemic in developed countries, but also developing

countries. As it becomes more apparent and problematic, the prevalence of obesity is trickling into all demographics of people, including college students. Research is beginning to understand the sobering picture of the current health of our young adults. As the rates of obesity increase within the younger demographic, we are now seeing instances of the early onset of diabetes, hypertension, and other cardiovascular issues. The recognition of a severe need for action is long past, and now the movement for clinical or behavioral reinforcement is necessary to counteract the saddening future of our young adults. To promote and enact interventions for living a healthy lifestyle and the commitment to healthy behavioral choices within the college population, the analysis of the most current data pertaining to overall wellness of the student must be deconstructed and re-purposed to focus on more specific and critical issues such as obesity. The hope of this study is to acquire reliable data on the current trends of student's wellness practices, and apply it towards future testing tools as well as contributing to future wellness programming and interventions for healthier practices of our young adults.



## CHAPTER 3

### METHODS

Obesity continues to be a critical issue worldwide in both underdeveloped countries as well as developed countries such as the United States. Currently, there are a number of treatment options for obesity, including dietary therapy, behavior modification, pharmacotherapy, and surgical interventions such as gastric bypass (Auvichayapat, 2008; NIH, 1998). Although these all reflect relatively effective treatments in terms of weight loss, the most commonly utilized treatments in society are dietary therapy and exercise programming.

As students transition from secondary education into higher education, they are faced with many different and new challenges. College students often are more prone to weight issues due to poor nutrition choices and decreased physical activity. Moreover, at a time when obesity among American adults is at epidemic proportions, the college population often is overlooked. The college experience is an impacting environment that has often been identified as a potentially critical period for increases in weight among young adults (Brunt & Rhee, 2007). Control over their life choices is part of the college experience for students. They are inundated with difficult schedules that are always in flux; exercise, homework and friends all compete for time. Parental bodies are not longer there to reduce stress. College students are now faced with the responsibility to prioritize their lives, unfortunately leaving health and wellness through exercise and physical activity at the bottom of their daily agenda.

Sedentary lifestyle and an excess of caloric intake are contributing factors to the overweight and obesity epidemic. This epidemic is more and more apparent in young

adults, more specifically those who are transitioning from lower education to higher education. The time span that is encompassed by this transition facilitates behavioral changes and patterns that are specific to the decrease in physical activity and poor dietary choices (Racette et al., 2010). According to a study by Racette et al., (2010), physical activity or the participation in physical activity progressively decreases between the ages of 12 to 21 years old. Serving as a critical point in the development of healthy lifestyle behaviors, the collegiate and university setting is a strategic environment that can facilitate proper weight management behaviors through public forums as the already established routes of communication within campus via paper, word of mouth, and electronic means.

The purpose of the proposed study is to investigate the relationship between the desire to lose weight and (a) physical activity behavior and (b) dietary practices in a sample of college-aged students from a small, comprehensive northeastern college.

### **Participants**

The participants of the study were comprised of 1000 undergraduate students enrolled in a small, comprehensive northeastern college. Participants (628 females and 372 males) were between the ages of 17 to 27 years old and had completed the National College Health Assessment II survey during the 2009 and the 2012 academic years.

### **Instrument**

National College Health Assessment II (NCHA): The National College Health Assessment II is an annual survey of various health-related behaviors along with demographic characteristics that is administered to college students nationwide by the American College Health Association (ACHA). Permission to access and analyze the

data was granted to a member of the candidate's thesis committee by the college. Of particular interest for this study were questions that examined responses and behaviors related to self-rating of overall general health (Question 1), receiving information on topics of interest, body weight perceptions, the desire to lose weight, dietary intake, and physical activity participation.

Specific to participant weight, respondents were asked "How would you describe your weight" (Question 26) with response options "Very underweight", "Slightly underweight", "About the right weight", "Slightly overweight", and "Very overweight". Respondents were also asked about weight loss goals (Question 27) with response options being "I am not trying to do anything about my weight", "Stay the same weight", "Lose weight", or "Gain weight". In addition, respondents could report (Question 38) whether or not (Yes or No) they had exercised, dieted, vomited or used laxatives, or used diet pills to lose weight in the previous 30 days.

Specific to dietary behavior (Question 28), respondents were asked how many servings of fruits and vegetables consumed each day with response options of (a) 0, (b) 1-2 servings, (c) 3-4 servings, or (d) 5 or more servings per day. Respondents also indicated whether or not (Yes or No) they had received information on nutrition (Question 2) and whether they would like (Yes or No) to receive such information (Question 3).

Specific to physical activity participation (Question 29), respondents were asked about their frequency (0 days to 7 days) in performing (a) 30-minutes of moderate-intensity exercise, (b) 20-minutes of vigorous-intensity exercise, and (c) 8-12 strength training exercises. Respondents also indicated whether or not (Yes or No) they had

received information on physical activity (Question 2) and whether they would like (Yes or No) to receive such information (Question 3).

### **Procedure**

Informed consent of the participants was obtained prior to the administration of the NCHA during the fall 2009 and spring 2012 semesters from both paper and electronic forms. The final sample contains approximately 1000 responses from a hardcopy survey. For the purpose of the study, the following seven questions were selected to best represent the (a) purpose of the study and (b) to accurately analyze the research focus:

**-Gender (Question 47):** Male or Female

**MVPA (Question 29):** frequency (0 days to 7 days) in performing (a) 30-minutes of moderate-intensity exercise, (b) 20-minutes of vigorous-intensity exercise, and (c) 8-12 strength training exercises.

**-Fruit and Vegetable Intake (Question 28):** fruits and vegetables consumed each day with response options of (a) 0, (b) 1-2 servings, (c) 3-4 servings, or (d) 5 or more servings per day.

**-Exercise (38):** the use of exercise to lose weight within the last 30 days (Yes or No).

**-Diet (38):** the use of diet to lose weight within the last 30 days (Yes or No).

**-Diet Pills (38):** the use of diet pills to lose weight within the last 30 days (Yes or No).

**-Vomiting/Laxatives (38):** the use of vomiting and laxatives to lose weight within the last 30 days (Yes or No).

## Statistical Analyses

Logistic regression was used to examine the contribution of variables in explaining the desire to lose weight. Predictor variables for this analysis included (a) gender, (b) daily fruit/vegetable intake, and (c) days participating in moderate/vigorous physical activity (MVPA). A chi-square statistic was also used to further investigate the relationship between those individuals who reported wanting to lose vs. those reporting not wanting to lose weight, and the variables of fruit and vegetable intake, exercise behavior, diet use for weight loss, diet pill use for weight loss, and laxative and vomiting behavior as a weight loss method. To further examine possible gender differences, separate chi-square statistics were computed to investigate the relationship between gender on weight loss behaviors pertaining to exercise and diet within the same parameters as listed above. Significance was set at  $p \leq 0.05$ .

## CHAPTER 4

### RESULTS AND DISCUSSION

The purpose of the study was to investigate the relationship between the desire to lose weight and (a) physical activity behavior and (b) dietary practices in a sample of college-aged students from a small, comprehensive northeastern university. A logistic regression was used to examine the contribution of variables in explaining the desire to lose weight. Predictor variables identified within this study included (a) gender, (b) daily fruit/vegetable intake, (c) days participating in moderate/vigorous physical activity, and (d) the use of diet/exercise to lose weight. To more specifically explain the relationship between dietary practice as well as exercise behaviors, chi-square tests were also utilized in all categorical variables which include, fruit /vegetables intake, exercise to try and lose weight, diet to try and lose weight, the use of diet pills to lose weight, and the use of laxatives or vomiting to lose weight. To focus the investigation, a chi-square statistic was also administered to investigate the relationship between the above stated variables and their specific relationship with gender. The purpose of this was to further investigate in greater specificity any significant relationships between weight loss and exercise behaviors within a specific gender.

Data cleaning procedures were done to ensure the accuracy of the study. Within the school year group, 36 observations were omitted due to missing data. Within the gender group, four observations were omitted because they fell outside the parameter of Male/Female (self-identified as transgender). Within the weight loss group, 57 observations were omitted because they fell outside the parameter of wanting to lose weight (self-reported as wanting to gain weight). Within the fruit and vegetable

consumption variable, one observation was omitted because it fell outside the inclusion criteria of the study. Eighteen observations within the MVPA group were omitted because they fell outside the inclusion criteria of the study.

### Results – Part A

**Demographic:** The participants of the study were 1000 undergraduate students (758 females, 242 males) enrolled at a small, comprehensive northeastern college. Participants ranged between the ages of 17 to 27 years old and completed the National College Health Assessment II survey during the combined 2009 and 2012 academic years.

Table 1

#### *Attempts at Weight Loss*

Behaviors	Weight loss	No Weight	Total
Not trying to lose weight	0	116	116
Stay the same weight	0	256	256
Lose weight	628	0	628

Table 1 shows the total number of participants falling under the three categories of weight loss management as self-reported in the survey. According to Table 1, the majority of those surveyed reported wanting to lose weight (628 participants), while 116 participants reported not wanting to lose weight, and the remaining 256 participants reported wanting to stay the same weight.

Table 2

*Weight Loss by Gender*

Gender	Weight Loss	No Weight
Male	125	107
Female	503	255
Total	628	372

According to the descriptive data in Table 2, the data suggests that of the 628 participants wanting to lose weight, there were a larger number of female respondents who expressed the intention of wanting to lose weight compared to their male counterparts (125 males vs. 503 females). Likewise, there were a greater number of female students reporting not wanting to lose weight compared to their male counterparts (107 males vs. 255 females).

Table 3

*Weight Loss and Gender by School Year*

School Year	Weight loss (M)	Weight loss (F)	No Weight loss (M)	No Weight loss (F)
1	26	107	12	46
2	24	112	29	55
3	35	145	40	92
4	33	113	30	55
5	7	36	6	7

Table 3 shows the number of students within each academic class designation either attempting to lose weight or not attempting to lose weight based on gender. Although Table 3 suggests that there was no real numeric change within the males wanting to lose weight vs. males not wanting to lose weight, there is an observable



incongruence in weight loss behaviors in females versus the males, suggesting that gender was a variable that was predictive of weight loss behaviors.

Table 4

*Regression Statistics on Weight Loss Practices and its Contributing Variables*

Contributing Variables for Weight Loss	Significance Level ( $p$ )	Confidence Interval	
Gender**	0.001	-.9138395	-.3220305
Fruit/Vegetable Intake	0.25	-.0889748	.3374253
MVPA	0.25	-.0151444	.0572339

\*\* $p < .05$ , suggests that there is a relationship between weight loss practices and a specific variable.

The results of the regression analysis indicates those individuals trying to lose weight did not engage in significantly more bouts of physical MVPA ( $p = 0.25$ ) or Daily Intake of Fruit and Vegetables ( $p = 0.25$ ) after accounting for Gender. The variable that did express a significant relationship to weight loss behavior was Gender ( $p < 0.001$ ), suggesting that there was a significant difference with weight loss behavior within the female vs. male gender.

Table 5

*Exercise and Vegetable/Fruit Intake Contribution to Weight Loss Behavior*

	Wants to Lose Weight (M) (SD)		Does Not Want to Lose Weight (M) (SD)	
Exercise	4.39	.09	4.18	.12
Fruit/Vegetable Intake	.04	.00	.04	.01

The participants within the study in both groups of wanting to lose weight and did not want to lose weight showed little difference between the mean values with participants who exercise to lose weight ( $M = 4.39, SD = 0.09$ ) vs. those who exercised but did not want to lose weight ( $M = 4.18, SD = 0.12$ ). This trend is also observed with those who want to lose weight and their vegetable/fruit intake ( $M = 0.04, SD = 0.00$ ) and those who do not want to lose weight ( $M = 0.04, SD = 0.01$ ).

Table 6

*Frequencies and Proportions of Exercise / Dietary Contribution to Weight Loss Behavior*

Variables	Wants to Lose Weight		Does Not Want to Lose Weight		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
<b>Exercise*</b>						
Yes	523	83.41	132	35.68	655	63.70
No	104	16.59	238	64.32	342	34.30
<b>Fruit/Vegetable Intake</b>						
Yes	26	4.14	16	4.30	42	4.20
No	602	95.68	356	95.70	958	95.80
<b>Diet to Lose Weight*</b>						
Yes	409	65.23	70	19.02	479	48.14
No	218	34.77	298	80.98	516	51.86
<b>Use of Diet Pill to Lose Weight*</b>						
Yes	44	7.07	4	1.09	48	4.85
No	578	92.93	364	98.91	942	95.15
<b>Laxatives/Vomiting to Lose Weight*</b>						
Yes	28	4.47	3	.81	31	3.11
No	598	95.53	367	99.19	965	96.89

\*Significant findings  $p < 0.05$

To identify the relationship and relationship between the nutritional and exercise behaviors examined in this study, a chi-square statistic was used. The chi-square within this specific group focused on the use of exercise within the last 30 days as a means to lose weight. From the data acquired, the findings suggest that there was a significant

difference between those who wanted to lose weight and their use of exercise within the last thirty days,  $\chi^2(1) = 235.2960, p < .001$ . This suggests that individuals who wanted to lose weight participated in exercise compared with those not wanting to lose weight.

Within dietary behaviors, a chi-square analysis was performed to identify the difference between the reported applications of diet for those wanting to lose weight versus those not wanting lose weight. The findings suggest that there is a significant difference with those wanting to lose weight and their participation in diet behaviors versus those who do not want to lose weight,  $\chi^2(1) = 198.3427, p < .001$ .

The use of supplements such as diet pills is a common pharmacological practice for those wanting to lose weight. Within the current sample, the study investigated the relationship between the uses of weight loss pills for those who want to lose weight. The data suggest that the use of weight pills was minimal within both those wanting to lose weight (7.07%) and those not wanting to lose weight (1.09%). The results show a significant difference between those who want to lose weight compared to those not wanting to lose weight and the use of weight loss pills,  $\chi^2(1) = 17.9639, p < .001$ .

As a means of weight loss behaviors, the use of laxatives and vomiting can be utilized to achieve his/her weight loss goals. Within the sample, the study conducted a chi-square analysis to identify the relationship between weight loss behaviors and the use of laxatives and vomiting. The results suggest that in both the weight loss group (n=598) and the non weight loss group (n=367), 96.98% reported no use of this weight loss technique, while 3.11% of the sample reported the use of laxatives and vomiting as a weight loss technique (n=31). The findings suggests that there was a significant

relationship between the use of laxatives and vomiting between weight loss and non weight loss groups,  $\chi^2(1) = 10.3417, p < .001$ .

### Results Part B: Gender-specific Analyses

According to the results there was a significant relationship between gender and weight loss behaviors ( $p < 0.001$ ). To further investigate this significant relationship, chi-square analysis was computed to identify the relationship between gender and the desire to lose weight.

Table 7

*Exercise in the Last 30 Days to Lose Weight between Genders*

	Males		Females	
	Percent	Total ( <i>n</i> )	Percent	Total ( <i>n</i> )
Exercise	81.45%	101	83.90%	422
No exercise	18.55%	23	16.10%	81

To investigate the relationship between gender and the modality of exercise to lose weight, a chi-square statistic was used. Upon closer investigation, there was no significant relationships found between gender and the use of exercise to lose weight,  $\chi^2(1) = .4298, p = 0.512$ . This indicates that there is no obvious relationship between gender and exercise behavior as a method of weight loss.

Table 8

*Fruit/Vegetables Consumption and Gender*

	Wants to Lose Weight (%)	Does Not Want to Lose Weight (%)
Males	4.14%	95.86%
Females	4.48%	95.52%

To identify the relationship gender and fruit/vegetable consumption, a chi-square analysis was used. The chi-square calculated comparing an observable significant relationship of the data between gender and fruit/vegetable consumption for those trying to lose weight and not trying to lose weight. No significant relationships was found,  $\chi^2(1) = 0.0150$ ,  $p = 0.902$ . Ultimately, the data suggests that although both groups are ingesting fruits and vegetables, the total consumption is less than 5%, suggesting that regardless which gender and category of weight loss versus no weight loss, neither groups are achieving the recommended daily allowances of fruit and vegetable consumption per day.

Table 9

*Use of Laxatives/vomiting in last 30 Days to Lose Weight between Genders*

	Males		Females	
	Percent	Total (n)	Percent	Total (n)
Use of Laxatives/vomiting	1.61%	2	5.18%	26
Did not use Laxatives/vomiting	98.39%	122	94.82%	476

The use of laxatives and vomiting as a means to lose weight was also investigated in this study. To further investigate the relationship of laxative and vomiting use within the genders, a chi-square analysis was calculated. According to the data, both males and females reported that they did not use laxatives or vomiting as a weight loss tools; males (98.39%) and females (94.82%). Conversely, only 5.18% of females utilized these behaviors and less than 2% with males as well (1.61%). Within this set of data, the results suggest that there was no significant relationship between the two genders and the use of laxatives and vomiting,  $\chi^2(1) = 2.9600, p = 0.085$ .

Table 10

*Use of Diet Pills to Lose Weight between Genders*

	Males		Females	
	Percent	Total ( <i>n</i> )	Percent	Total ( <i>n</i> )
Use Diet Pills	3.23%	4	8.03%	40
Did Not Use Diet Pills	96.77%	120	91.97%	458

The use of diet pills as a weight loss tool is becoming a more common trend as a weight control technique. Within the sample size, one of the questions asked in the health assessment asked individuals whether they have used a weight loss pill as a means to lose weight. A chi-square analysis was performed to identify the use of a diet pill by each specific gender as weight loss tool. The results suggest that there was no significant relationship between the two genders and the use of weight loss pills as a means for weight loss,  $\chi^2(1) = 3.4889, p = 0.062$ .

Table 11

*Use of Diet to Lose Weight between Genders*

	Males		Females	
	Percent	Total ( <i>n</i> )	Percent	Total ( <i>n</i> )
Diet to Lose Weight	53.60%	67	68.13%	342
Did Not Diet to Lose Weight	46.40%	58	31.87%	160

Aside from physical activity, diet plays an important role in the weight loss process. Within the health assessment, individuals were asked to report their use of dieting as a means for weight loss. Although the study did in fact conclude a significant relationship between dieting and weight loss, the focus turned to the relationship between dieting and gender. To investigate this relationship, a chi-square analysis was used. According to the data, a greater percentage of females (68.13%) vs. males (53.60%) had higher reported instances of using of diet in weight loss. The study also suggests those who did not want to lose weight were more prominent among female respondents, did not use diet as a weight loss technique. This data reinforces and suggests that there is a significant relationship within females and their utilization of diet as a means for weight loss  $\chi^2(1) = 9.3129, p < .05$ .



## CHAPTER 5

### SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The primary purpose of the study was to examine the relationship between the desire to lose weight in a college-aged sample of 1000 undergraduate students and the following predictive variables: (a) physical activity behavior and (b) dietary practices as self-reported on the National College Health Assessment II survey. A logistic regression was calculated to determine if any relationships were present between dietary behavior and physical activity as a means to lose weight by loading the following predictive variables: (a) gender, (b) daily fruit/vegetable intake, and (c) days participating in moderate/vigorous physical activity. Because only gender proved to be significant ( $p < 0.001$ ), suggesting that female college-aged students gravitate towards weight loss behaviors more than their males counterparts, a series of chi-square analyses were then performed to investigate (a) group differences (i.e. want to lose weight vs. not want to lose weight) and (b) gender differences between those wanting to lose weight compared to those not wanting to lose weight. The chi-square analyses examined the self-reported use of (a) diet/exercise, (b) diet pills, (c) laxatives and vomiting to lose weight. While there were group differences on all predictive variables other than Fruit/Vegetable Intake, there were, however, no other significant gender differences observed between weight loss behaviors and the other predictive variables.

#### **Conclusions**

The findings suggest that the desire to lose weight and the actual practice is complex and varies according to gender. It appears that the female college students in the two data collection periods were more likely to report wanting to lose weight compared

to the male college students. Many studies corroborate the finding that women are more likely to attempt losing weight than males. According to a study by Malinauskas et al. (2006), their findings suggested a greater prevalence of females trying to lose weight. Specifically, 46% of the female participants reported wanting to lose weight or trying to lose weight, while 33% of male participants reported the same. While there was significant difference between gender and weight loss behavior, their data suggested that both groups (wanting to lose weight and not wanting to lose weight) both utilized identical weight loss techniques and behaviors to achieve weight loss goals. Interestingly, in the current investigation, the common practices of eating healthier ( $p = 0.25$ ) and engaging in physical activity ( $p = 0.25$ ) were not significant predictors of wanting to lose weight.

In relation to the chi-square results between the specific groups of wanting to lose weight and not wanting to lose weight, the data did suggest that there were significant relationships between various weight loss methods. The data suggested that the group wanting to lose weight had the tendency to exercise more ( $p = .001$ ), utilize dieting behaviors ( $p = .001$ ), utilize laxatives or vomiting as a weight management behavior ( $p = .001$ ), and use diet pills for weight loss ( $p = .001$ ). Only fruit and vegetable intake did not reach the level of significance. These findings reinforce the notion that although gender is a significant factor related to wanting to lose weight, when participants were placed into two groups based on self-reports of wanting to lose weight or not wanting to lose weight, the same weight loss strategies were common to both genders.

To more closely examine the role of gender within exercise and diet practices, a separate series of chi-square analyses were utilized. The data from those specific analyses

suggested that there were no significant relationship between gender and the utilization of exercise to lose weight ( $p = .512$ ), the use of laxatives or vomiting ( $p = .085$ ), or the use of diet pills ( $p = .062$ ). Interestingly, just as there was no significant relationship between fruit and vegetable intake between those wanting to lose weight compared with those not wanting to lose weight, there were also no significant relationship between fruit and vegetable intake between genders. This finding highlights the fact that both genders are deficient in acquiring healthy recommended daily allowances of the specified 4-5 servings per day (<http://www.health.gov/dietaryguidelines/dga2000/document/build.htm>). The one gender-specific chi-square analysis that reported a level of significance was the utilization of diet as a weight loss technique for those wanting to lose weight ( $p = .001$ ). This result suggests that dieting for weight loss for the female gender may be perceptually the most logical course of action in achieving weight loss. Supporting this finding is a study by Latimer et al. (2013) which reinforces the concept that women utilize dietary practices as a strategy for weight loss. According to Latimer et al. (2013), those who participate in exercise as well as engage in proper dieting strategies as a means for weight loss were significantly more likely to be females than males. The authors suggested that "...male students were less concerned about weight and used fewer strategies to control weight gain than females" (Latimer et al., 2013).

Collectively, the data suggest that the transition from home to a more independent college environment may create a greater challenge for students to adequately engage in behaviors that encourage health and well-being. One possible explanation for these unhealthy choices may be the role stress plays in the life of a college student. Stress can be a major component to the growing obesity/overweight issue within the college

community. Torres and Nowson (2007) conceptualized stress as an individual's response, both physiological and psychological, that overwhelms or threatens to overwhelm the body, ultimately disturbing internal and external homeostasis. Individuals cope differently with stress. While some students may engage in protective behaviors, other may engage in destructive behaviors. According to Nguyen et al. (2006), 60% of college students perceive their levels of stress as *high* or *very high*. These normative stressors take the form of course loads and examinations as well as environmental, social, and emotional demands. Increasing levels of stress have detrimental effects on the physiological and psychological health of the student. As it pertains to college students and obesity, not only does stress result in the form of poor nutritional choices and increased sedentary behaviors, but also negatively impacts personal motivation and disrupts the development of positive weight management practices (DHHS, 2010).

It is also apparent in social environments where stress or the presence of stressful situations can be a factor in consuming unhealthy foods such as those high in fat or sugar, or beverages such as alcohol. Although the evidence supports an increase consumption of unhealthy foods due to stress, research by Haring et al. (2010) also reinforces the idea of stress as a driving force behind unhealthy dieting within the collegiate community due to negative body image. Conversely, Dinger and colleagues (2014) demonstrated relationships between college students engaging in moderate to vigorous physical activity and (a) recommended fruit/vegetable intake and (b) less perceived depression. This need or want could be the result of such factors which include, but are not limited to, societal and cultural norms, gender-based pressures or expectations as well as self efficacy. These results should create an emphasis on the facilitation of open forums on campus that will

help individuals address effective eating and exercise strategies to maintain and or achieve a healthy lifestyle.

### **Implications**

The increased prevalence of physical inactivity and obesity in the college student population strongly suggests that college students are excellent candidates for programs designed to promote healthy dietary habits and increase daily physical activity. Three themes seem to emerge from the current study. First, there is a notable difference between genders in wanting to lose weight. Second, and consistent with the first point, it appears that female college students are more likely to engage in some sort of diet practice to lose weight. Third, using those wanting to lose weight as a distinct group, it seems that both healthy (e.g., engaging in exercise to lose weight) and unhealthy (e.g., not getting the recommended daily amount of fruits and vegetables) weight management practices are being utilized. These findings provide a rationale for exploring curricular and educational opportunities to better inform college students of health lifestyle behaviors.

### **Recommendation and Future Study**

Given that the numbers of obese college students is on par with that of the U.S. adult population (Ogden et al., 2012; West et al., 2009), this segment of the population seems appropriate for weight management educational interventions. Instilling healthy dietary and physical activity habits during the formative college experience will hopefully translate into continued healthy lifestyle choices post-graduation. Programs that provide academic courses related to understanding healthy behaviors are strongly encouraged. Likewise, it is recommended that on-campus workshops be offered

throughout the academic year to maintain motivational levels of college students. Finally, it is worth exploring the possibility of disseminating information on healthy dietary practices and physical activity opportunities via institution-run websites or social media outlets.

In conclusion, college students reporting wanting to lose weight showed a varied response as to the actual practices of weight loss. Gender was the only significant predictive variable related to wanting to lose weight while fruit and vegetable intake and engaging in moderate to vigorous physical activity were not related. Moreover, there were not any other gender differences except for engaging in diet as a weight loss practice. When respondents were grouped according to their desire to lose weight (i.e. want to lose weight vs. not want to lose weight), there were significant differences among both healthy and unhealthy weight loss practices. As the obesity epidemic increases, there is a greater need for individuals to be consciously aware of their exercise and dietary habits. Unfortunately for college students, the drastic change in their environment along with the educational and social demands places health and wellness lower on their priority list. Future studies within this demographic is warranted to bridge the gap between understanding the role of the college student and the role of the academic institution in the prevention of unhealthy behaviors and the promotion of healthy behaviors, in particular those related to sustainable dietary and physical activity practices.

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