

AN ANALYSIS OF PSYCHOSOCIAL CONSTRUCTS OF WEIGHT BEHAVIORS
AMONG COLLEGE WOMEN

A THESIS

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BY

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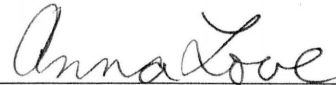
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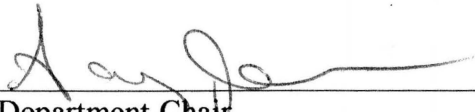
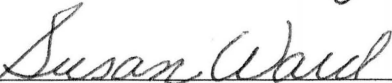
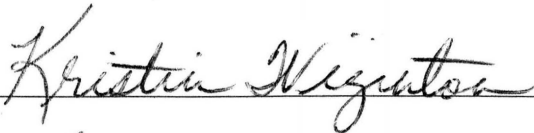
To the Dean of the Graduate School:

I am submitting herewith a thesis written by Jamecia Lynn Finnie entitled "An Analysis of Psychosocial Constructs of Weight Behaviors among College Women." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science with a major in Health Studies.



Anna Love, Ph.D., Major Professor

We have read this thesis and recommend its acceptance



Department Chair

Accepted:



Dean of the Graduate School

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ABSTRACT

JAMECIA FINNIE

AN ANALYSIS OF PSYCHOSOCIAL CONSTRUCTS OF WEIGHT BEHAVIORS AMONG COLLEGE WOMEN

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This study used archival data collected from the 2005 Psychosocial Barriers to Healthy Behaviors in College Students Project at a midsize, public university in the southwestern region of the United States. A phenomenological approach was used to analyze nine focus groups for barriers, sociocultural influences, locus of control, and sources of health information, concerning healthy weight behaviors among college women 18 and 44 years of age. Six research questions were developed to complete the study purposes.

Focus group data were transcribed from audio recordings, audited using video recordings, and coded. Then, the long table method was used to generate themes. Additionally, video recordings were analyzed for body dynamics.

Five overarching themes were found. Additionally, results show that internal conflict and the internalization of cultural norms may play a major role in participants' ability to control healthy weight behaviors. Creating studies that seek to understand the multitude of factors that influence weight behaviors will help researchers understand and alleviate the current obesity epidemic.

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CHAPTER I

INTRODUCTION

Plato proposed that a questioning person is an individual acquiring knowledge (learning). According to Plato, the practice of questioning leads to an understanding that is capable of shifting thought processes and thus transforming individuals' outlook of the world and environment (Plato, Grube, & Reeve, 1997). In many instances the above assertion is true, but in the case of obesity, knowledge may have minimal effect. Davy, Driskell, and Benes (2006) analyzed college student nutrition beliefs and found that 94% of the participants believed it was important to eat a variety of foods for good health. However, Lowry et al. (2000) analyzed data from the 1995 National College Health Risk Behavior Survey and found that only 37.6% of students participated in vigorous physical activity at least 3 times a week and only 26.3% ate 5 or more servings of fruits and vegetables per day.

Overview and Pervasiveness of Weight-related Problems

Society's access to health information increased as scientific discoveries and global communication tools, such as the Internet, flourished (Harrison & Lee, 2006). However, it appears that many individuals are failing to incorporate this knowledge into their behaviors (Daniels, 2006). Thus, the following question arises: what enables people to adopt and sustain lifestyles that maintain a healthy weight?

In the United States, approximately 64% of adults are obese or overweight (Daniels, 2006). What was once thought of as a little extra weight is now associated with increased risk for diabetes, heart disease, dislipidemia, arthritis, sleep apnea, gall stone formation, and many cancers (Daniels). An adult who gains fifteen pounds increases his/her chances for diabetes by 50%; the degree to which the increased risk occurs is age dependent with varying effects for youth and adults (Daniels, 2006).

In Texas, approximately 63% of adults are overweight or obese. Twenty six percent of fourth graders, 19% of 8th graders, and 15% of 11th grade students are also overweight in Texas (CDC, 2004; Daniels, 2006). Likewise, rising overweight and obesity rates are a part of the college environment. The National College Health Risk (1997) Behavior Survey found that 35% of college students may be obese or overweight. Similarly, Huang et al. (2003) researched overweight and obesity rates at a Kansas university and found that 21% of students were overweight, while 4.9% were obese.

Psychosocial and Cultural Factors

Hawkins (2005) surveyed graduating seniors from a historically Black university in the mid-Atlantic region and found inaccurate weight perceptions. She also found that African American college students were more concerned about appearances rather than achieving a healthy weight for health benefits. Similarly, DeBate, Topping, and Sargent (2001) utilized a 37-item Likert questionnaire, 24-hour recall, and self-reported weight and height, and found that African American females had higher BMIs than their

Caucasian counterparts, gained more weight since beginning school, did not meet recommended fruit and vegetable intake, exceeded recommended meat intake, and reported higher rates of fast food consumption.

Sociological Factors

Sarlio-Lahteenkorva, Silventoinen, and Lahelma (2004) compared women of similar economic status (stratified and grouped by income) and found that obese women made significantly less income than their normal weight counterparts. Wardle, Waller, and Jarvis (2002) found that the occurrence of obesity was lower as education and economic status increased. By studying neighborhoods and economics, Malmstrom, Sundquist, and Johansson (1999) confirmed that higher education attainment and lower obesity rates were related on a broad scale. They found that poorer, less educated neighborhoods had a higher incidence of overall poorer health (Malmstrom et al., 1999). Even more surprising, educated African American women displayed higher BMIs compared to their Caucasian educated female peers indicating that income and education alone are not sufficient to explain differences in obesity rates across ethnicities (Hawkins, 2005).

Self-efficacy

Fallon, Wilcox, and Ainsworth (2005) found that self-efficacy, related to physical activity, increased as women experienced fewer social role constraints such as household tasks and family responsibilities, more positive perceptions of physically active women, and a better sense of community.

Also, Cohen, Finch, Bower, and Sastry (2006) found a strong correlation between collective efficacy (group members providing support and accountability for each other) and healthy weight status.

The obesity epidemic is affecting all populations in the United States. Specifically, college women may be at a greater risk for developing this condition due to psychosocial factors present in the college environment. Targeting this population may help stifle future obesity rates.

Statement of the Purpose

Using archival data collected from the 2005 Psychosocial Barriers to Healthy Behaviors in College Students Project at a midsize, public university in the southwestern region of the United States, this study used a phenomenological approach to analyze barriers, sociocultural influences, locus of control, and sources of health information, concerning healthy weight behaviors among college women 18 and 44 years of age (Love & Rich, 2005).

Research Questions

1. What barriers prevent the adoption of healthy weight behaviors among college students?
2. What sociocultural influences (such as environment, peers, and culture) support the adoption of healthy weight behaviors among college students?
3. What are college students' perceptions of their locus of control in relation to healthy and unhealthy weight behaviors?

4. How do college students perceive familial influences on current healthy or unhealthy weight behaviors?
5. What aspects of the campus culture influence healthy and unhealthy weight behaviors among college students?
6. What sources are college students accessing to gain knowledge about healthy weight behaviors?

Delimitations

The following criteria were beyond the scope of this project and were not taken into consideration:

1. Women outside the ages of 18 to 44 years of age will be excluded
2. Genetic factors will not be evaluated.

Limitations

The following were limitations of the study:

1. Participants were limited to the university's campus and from this population a convenience sample was obtained using introductory psychology courses.
2. All participants completed a series of questionnaires before the focus group sessions. The questionnaires may have affected students' responses during the focus groups.

Assumptions

1. All participants were fluent in English.
2. All participants answered the questions honestly.

Definitions of Terms

Psychosocial – Involving aspects of both social and psychological behavior (CDC, 2006a).

Body Mass Index – Ratio of weight (in kilograms) and height (in meters squared) (CDC, 2006a).

Healthy Weight – Body mass index (BMI) 18.5 - 24.9 kg/m² (Antipatis & Gill, 2001).

Healthy Weight Behaviors – Nutritious eating and adequate physical activity as defined by the Department of Health and Human Services and the Department of Agriculture (United States Department of Agriculture [USDA], 2005).

Locus of Control – Generalized belief about one's ability to control events (Glanz, Lewis, & Rimer, 2002)

Self-efficacy – Believing that one has the ability to take action and persist in one's pursuits for a specific behavior (Bensley & Fischer-Brookins, 2003)

Summary

This study will provide insight into the factors influencing obesity rates for a variety of women. The university's campus has a unique, diverse group of women, which allows for a broad spectrum of analysis. Similarly, the campus is a non-traditional, minority serving institution. The women on the campus come from various backgrounds throughout the state and country. Data from this population will provide helpful information about the influences and barriers of health behaviors that may be utilized in treatment strategies with obese and overweight individuals.

CHAPTER II

REVIEW OF LITERATURE

In today's media the word obesity is abundant. Mass media reports of obesity prevention, modification, prevalence, and impact are common commodities for most Americans. However, in the midst of varying definitions of obesity, statistics, and diagnostic procedures, it is difficult to differentiate between the expansive details without considering multiple aspects of obesity. Therefore, this literature review will provide an overview of obesity, explore current health behaviors of college students, examine factors that influence the adoption of healthy behaviors, investigate obesity intervention strategies, evaluate health information delivery concerning college women, and summarize qualitative methods.

Overview of Obesity

It is impossible to provide in-depth information on obesity without exploring the development of the condition and contextual information. Therefore, common types of obesity and diagnostic procedures are explored in order to provide a foundation for the epidemiological and etiological data presented later. Most importantly, this section provides the framework that many health professionals use to report, explain, and structure obesity-related research.

Types of Obesity

Although the reporting of obesity-related health concerns appears to have increased drastically in the last ten years, research on the health impacts of obesity were not absent in the past. Bray (1998) reports that life insurance companies documented the mortality rates associated with excessive body fat for more than the last one hundred years. According to Bray, these documents played a major role in stimulating in-depth epidemiological studies of increased body fat. Over the years, as health professionals and scientists gathered to unravel the details of obesity, three distinct types were outlined as having significance to health outcomes (Bray).

The depositing and specificity of fat or adipose tissue is a genetic phenomenon, but also provides insight to the types of risks an individual may face based on his or her unique depositing of fat (Pond, 2001). While studying human adipose depositing, scientists have described three types of obesity based on these occurrences:

1. Increased body fat or body mass in relation to his/her stature (Bray, 1998).
2. Fat storage that is greater on the upper body than on the lower limbs and buttocks (Bray).
3. Upper body fat is predominantly in the visceral/abdominal region of the body (Bray). This third type has shown to be a critical factor in determining health implications, such as coronary disease and type II diabetes (Han & Lean, 2001).

The above distinctions may seem minimal, but have varying consequences in the population. For example, the first type of obesity, also known as whole body adiposity, tends to be least predictive of coronary artery atherosclerosis in women (Han & Lean, 2001). However, the third type of obesity has been shown to produce more drastic effects and increase the risk for coronary disease and type II diabetes (Han & Lean). It is important to understand the varying types of adipose depositing because this distinction may allow stratification of severity and risk. Additionally, the types of intervention available may target different types more efficiently. Understanding patterns of fat deposit could provide vital information for health professionals and aid in preventive studies as well.

Diagnostic Procedures for Overweight and Obesity

Currently, researchers use a number of methods to diagnose obesity. These methods can be divided into two categories: anthropometric and laboratory. The main difference between the two methods is that anthropometric procedures tend to occur in large-scale studies, may be less precise, and are less expensive (Han & Lean, 2001). Laboratory methods, on the other hand, are more precise, usually are utilized with smaller sample sizes, and are more expensive (Han & Lean). The anthropometric techniques discussed in this section include skinfold, circumference, and body mass index (BMI). The laboratory methods that will be included are underwater weighing, potassium-40 counting, dual-energy X-ray absorption (DEXA), computerized tomography, magnetic resonance imaging (MRI), and air displacement (BOD POD).

Anthropometric Measures of Body Composition

Skinfold Thickness. Skinfold thickness is defined as a measurement of “double thickness or fold of skin, underlying fascia, and subcutaneous adipose tissue that are taken using calipers at standardized locations on the body” (Bray, 1998, p.50). Various techniques are used to gain regional and whole body measurements, but the most common for total fat measurements is the four-fold method (Han & Lean, 2001). The measurements obtained from the calipers are then used in equations to predict body density, total body fat mass, or percent body fat (Bray). Although these equations can have percent errors as low as 3% when correct techniques are applied, careful consideration must be employed to ensure that prediction equations are validated in the chosen population (Bray, 1998; Han & Lean, 2001).

Furthermore, skinfolds present major limitations for some populations. For instance, most calipers are only measurable up to 40 or 60 mm (Bray, 1998), and some populations such as children, athletes, and the elderly can have inaccurate calculations due to physiological differences in these populations (Han & Lean, 2001). Therefore, although skinfold thickness can be quite convenient for large-scale populations, and provide relatively accurate estimates, precision with details of equations and measurements is a necessity.

Circumference. Unlike skinfolds, circumference measurements can be taken on a variety of populations, such as the extremely obese. The most common circumferences taken to predict body fat are upper arm, chest, waist or abdomen, hip or buttocks, thigh,

and calf (Bray, 1998). Waist and hip circumferences are commonly used to calculate the waist-to-hip ratio. The waist-to-hip ratio was the first anthropometric measurement used to predict metabolic diseases (Han & Lean, 2001). In more recent years, research has shown that waist circumference alone may be sufficient to gauge fat distribution in the abdominal region and predict risks for metabolic conditions (Seidell, 2001). The National Institutes of Health (National Heart, Lung and Blood Institute) adopted body mass index (BMI) classification in conjunction with waist circumference in 1998 as determinants of health risks (Seidell).

Body Mass Index. Most large-scale studies that evaluate weight status (World Health Organization, National College Health Risk Behavior Survey, and several published studies) do so by calculating BMI. Body mass index is defined as the quotient of an individual's weight (in kilograms) and his/her height (in meters) squared; resulting in a value with units of kg/m^2 (Antipatis & Gill, 2001). Many research projects calculate BMI from observed measurements, but some studies do use self-reported data (Antipatis & Gill). Most importantly, Antipatis & Gill warned researchers of the difficulties associated with interpreting BMI data from different ethnic groups and special populations such as weight lifters or athletes. The relationship between BMI and body fat varies based on body build and proportions (Antipatis & Gill). For example, Antipatis & Gill report that various individuals (of different ethnicities) with equal body fat, age, and gender, have varying BMI normal ranges. For different ethnicities, the normal ranged from 4.5 kg/m^2 higher to 4.6 kg/m^2 lower than the defined 18.5-24.9 kg/m^2

normal range (Antipatis & Gill). These variations may indicate that BMI normal ranges should vary based on ethnicity.

Laboratory Measures of Body Composition

The most common laboratory methods used to estimate adipose tissue are underwater weighing, potassium-40 counting, dual-energy X-ray absorption (DEXA), computerized tomography, magnetic resonance imaging (MRI), and air displacement (BOD POD). Although these techniques may be more accurate than anthropometric techniques, they are also based on average measures, such as the average density of fat—which is not constant for every individual (Bray, 1998; Han & Lean, 2001). These procedures also do not measure fat within organs (Han & Lean)

Thus, it is important that the diagnosis of overweight or obesity take into account the variations seen among different populations. Inaccurate diagnosis could lead to a multitude of unnecessary stress, interventions, medications, and etc. Therefore, health professionals must be adequately educated about diagnosing overweight and obesity among various populations.

Pervasiveness of Weight Gain

Global

Obesity was once thought of as a condition only affecting developed countries, but recent trends provide evidence that this condition is spreading throughout the world. In 2003, it was estimated that globally there were more than 1 billion overweight adults and 300 million obese adults (World Health Organization [WHO]). The World Health

Organization (2003) presents their information about overweight and obese individuals using BMI classifications. Likewise, developing countries such as Africa and China are so diverse among their many cities that rates fluctuate throughout these regions from as low as 5% to a high of 20% (WHO).

Compared to other conditions, such as malnutrition and clean water, or infectious diseases, obesity does not currently impose all of the problems many developed countries are facing. Currently, obesity related illnesses only account for 2-7% of the total health costs in most developed countries (WHO, 2003). However, the WHO predicts that increases in globalization, economic growth, modernization, and urbanization around the globe are destined to increase current global trends (WHO).

Texas

In Texas, the problem is visible among children (26% of fourth graders are overweight), teenagers (19% of 8th graders and 15% of 11th grade students are overweight), and adults (63% are obese or overweight) (Centers for Disease Control and Prevention [CDC], 2004). Obesity penetrates countries, cities, and neighborhoods, greatly increasing the chances of health problems and as a consequence lowering quality of life. As such, the college population is also vulnerable to the overweight and obesity patterns seen across the globe.

College Population

As young girls transition from adolescence to adulthood, they face many challenges in defining their identity. Within this web of discovery are the many factors

that affect women's perceptions of health behaviors, barriers to healthy behaviors, perceived locus of control, and access to health information. Research suggests that behaviors initiated in college may affect future obesity rates (George & Johnson, 2001). Thus, the college environment could provide insight to adult weight behavioral patterns.

College campuses are thriving grounds for unhealthy weight-related behaviors. Many campuses offer all-you-can-eat facilities for breakfast, lunch, and dinner. According to Land (2003) this environment can lead to a 20% weight gain during the first semester of college. At the University of Kansas (Lawrence), Huang et al. (2003) assessed diet and physical activity in 736 college students (47.9% were women; 90.7% were White, 2.8% were Hispanic, 2.7% were Asian/Pacific Islander, 1.8% were "other," 1.6% were African American, and 0.4% were Native American) using the Berkley Fruit, Vegetable, and Fiber Screener, the Youth Risk Behavior Survey, and self-reported weight and height. Huang et al. also found that with BMI classifications alone 21.6% of students were overweight and 4.9% were obese. These results were attributed to students eating and physical activity behaviors, which showed that more than two thirds of the sample consumed fewer than 5 servings of fruits and vegetables per day, and also exercised an average of 2.8 days in the last 7 days (Huang et al., 2003).

Furthermore, national college statistics mirror those found in the University of Kansas, Lawrence study. The American College Health Association-National College Risk Behavior Survey suggests that 35% of college students may be overweight or obese (CDC, 1997). This survey also suggests that only 25% of college students between the ages of 18-24 years old consume 5 or more servings of fruits and vegetables. Likewise,

the American College of Health Association (2005) found that only 7.0% of the 54,111 survey respondents reported eating 5 or more servings of fruits and vegetables per day in the last 7 days, 35.2% reported exercising 3-5 days in the last 7 days, and 29.8% had a BMI greater than 24.9 kg/m² placing them in the overweight or obese categories.

Causes of Obesity

At the most basic level, obesity develops when energy intake surpasses energy expended (Munsch & Beglinger, 2005; Worobey, Tepper, & Kanarek, 2006). However, several factors can promote or influence this imbalance of energy. These factors can be grouped into two categories: genetic (biological) and environmental. Hereditary factors are all attributed to an individuals' genetic make-up. This section will cover both the genetic and physiological aspects of obesity, and also examine environmental causes such as energy consumption, level of physical activity, stress levels, endocrine conditions, drug or alcohol consumption, and medications.

Biological Factors

Genetics. Although there are several proven environmental factors, genetic causes are surrounded by debate. Molecular genetic studies concluded that cases of extreme obesity are linked to mutations of the melanocortin-4-receptor (Mc4r) (Munsch & Beglinger, 2005). Nonetheless, this finding was only attributed to 3-5% of obese individuals with a BMI greater than 40 (Munsch & Beglinger). Instead of eliminating questions, this result elicits a plethora of inquiries. Are genetic factors present in less extreme cases of obesity or overweight? Are multiple genes involved in the development

of the condition? Scientists continue to research and study genetic factors, but it is assumed that in most cases, multiple genes play a role in the development of obesity (Munsch & Beglinger). Although scientists continue to study to search for genetic components of obesity, it is important to note that the gene pool for most individuals did not shifted much over the years, but obesity rates drastically rose (Worobey et al., 2006). This important assertion illuminates the difficulty associated with labeling obesity with a genetic etiology, but nevertheless also requires that research continue the pursuit of these answers.

Furthermore, the heritability of obesity has been studied through several methods. Studies with identical twins, fraternal twins, and twins reared apart have shown that heritability may account for 70% of the variation in BMI (Munsch & Beglinger, 2005). In stark contrast, however, adoption studies have only been able to account heritability to 30% of the variation in BMI. This result implies that environmental factors and other biological factors may have a greater influence. Overall, there is not enough conclusive evidence to appropriately quantify the role genetics play in the development of overweight and obesity.

Physiological. In addition to the suspected biological factors associated with weight gain, some hormones may also promote weight gain. The hormones known to influence adiposity are growth hormone (GH), glucocorticoids, insulin, and leptin. GH has long been recognized as a factor associated with fat mass (Klaus, 2001). Particularly, a deficiency in GH is known to be associated with enlarged fat cells in children (Klaus).

Similarly, glucocorticoids have also been shown to increase adipose tissue (Klaus). An example of this effect is seen in Cushing's syndrome, where individuals with the disorder develop increased abdominal fat (Klaus). Thus, hormonal levels can play a significant role in the development of overweight and obesity.

Similarly, insulin plays a role in adiposity. Insulin's overall function is the stabilization of blood glucose by promoting the uptake of glucose for cell usage or storage (Bray, 1998). However, some of insulin's related functions are linked to fat storage. For example, insulin also inhibits the breakdown and creation of fat cells (Bray). Therefore, in cases of hyperinsulinism the decrease of fat cells is stifled by the over-activity of insulin.

Leptin also contributes to adiposity. Leptin is a hormone produced by adipose cell (Rossum et al., 2002). Leptin binds to receptors in the hypothalamus, and may participate in the balance of energy regulation (Rossum et al.). It is suspected that individuals with higher levels of leptin also have higher percentages of body fats. Rossum et al. studied this phenomenon among young adults and found that weight gainers had significantly higher baseline leptin levels than those who kept stable a weight (odds ratio = 1.27; $p < 0.05$). Thus, increased leptin levels increased risk of weight gain by 27%.

Environmental Factors

Energy Consumption. On the other hand, the role of several environmental factors is not as elusive as genetic factors. Energy consumption in scientific research is may be labeled under a variety of subject headings: macronutrient intake, dietary intake, and

dietary energy density (Howarth, Murphy, Wilkens, Hankin, & Kolonel, 2006; Lovejoy, Champagne, Smith, Jonge, & Xie, 2001; Sherwood, Jeffery, French, Hannan, & Murray, 2000). Thus, energy consumption studies explore the components of an individual's diet.

Howarth et al. (2006) used secondary, baseline data collected in 1993 from a large prospective study, the Hawaii-Los Angeles Multiethnic Cohort (MEC), to determine if groups that regularly consumed a diet higher in energy density also had a higher BMI. Their sample consisted of 191,023 cohort members (86,713 men and 104,310 women) between the ages of 45 and 75 years old. The sample included 5 ethnic groups of men and women: African American (16.8%), Caucasian (24.8%), Latino (22.7%), Native Hawaiian (7.2%), and Japanese American (28.5%).

Participants completed a 26-page mailed survey that included a comprehensive quantitative food frequency questionnaire (QFFQ) that was developed specifically for the cohort study (Howarth et al., 2006). The questionnaire was of recall format and asked participants about their consumption of more than 180 food items (Howarth et al.). Using the results from the analysis of the QFFQ, Howarth et al. reported that energy density was significantly ($p < 0.05$) associated with BMI for all genders and ethnicity groups. Thus, despite apparent environmental differences (location, ethnicity, age, and varying cultures) all five cohort groups showed the same result: increased energy consumption is associated with increased BMI or weight gain (Howarth et al.).

Similar results were also published by Sherwood et al. (2000), which concluded that energy consumption was associated with increased weight gain. Sherwood et al. also used baseline, secondary data from a previous project—Pound of Prevention (POP)

study. Participants were community volunteers between the ages of 20 and 45 years old ($n = 826$ women and $n = 218$ men). Dietary intake and BMI were measured to explore relationships between the variables. Trained staff measured participants' height and weight. Additionally, community volunteers completed the Block Food Frequency Questionnaire in order to assess dietary intake (Sherwood et al.). Sherwood et al. reported positive associations between energy intake and weight gain among men ($p < 0.001$) and women ($p < 0.001$).

Moreover, Lovejoy et al. (2001) studied dietary intake in African-American and White premenopausal women. These researchers recruited and screened volunteers from the Louisiana ($n = 52$ African-American women and $n = 97$ White women). In order to participate in the study all women were 43 years of age or older, and had to meet certain menstruation requirements (to establish premenopausal state) (Lovejoy et al.). Lovejoy et al. obtained information about participants' dietary intake and body composition in order to assess the relationship between energy consumption and weight gain.

Participants' body composition was obtained by using dual-energy X-ray absorption (DEXA) techniques, and dietary intake was assessed by completing a four-day food record that was analyzed using Moore's Extended Nutrient Database (Lovejoy et al., 2001). Lovejoy et al. reported similar, yet somewhat different results than Sherwood et al. (2000) and Howarth (2006): significant, positive association between saturated fat and percentage body fat in African American ($p < 0.05$) and White women ($p < 0.05$). However, the association between BMI and saturated fat intake was only significant in African American women ($p < 0.05$).

All of the studies that explored energy consumption and increased likelihood for weight gain, reported positive relationships (Howarth et al., 2006; Lovejoy et al., 2001; Sherwood et al., 2000). However, Lovejoy et al. implied that more sophisticated methods of body composition analysis may provide differing results than just analyzing BMI alone. As discussed earlier, vast differences exist between ethnic groups, body structure, and fat depositing (see obesity diagnostic procedures section). Thus, when exploring ethnic differences and associations between energy intake and body composition, researchers may have to employ a variety of anthropometric and laboratory methods to ensure parallel results.

Level of Physical Activity. One of the most studied environmental factors is level of physical activity. As industrialized countries progress, technology has decreased the workload of citizens (Worobey et al., 2006). For example, cars and mass transportation reduced the time spent walking, and everyday appliances such as washing machines have decreased the requirement to perform these tasks manually (Worobey et al., 2006). More so, as manual labor has decreased, physical activity through other methods such as regular exercise disproportionately increased. Several studies examined college women's level of physical activity (Buckworth & Nigg, 2004; Cason & Wenrich, 2002; Irwin et al., 2002; Keating et al., 2005; Rozmus, Evans, Wysochansky, & Mixon, 2005). Within these studies, rates of exercise among traditional college women averaged 2 days per week, which is below the recommended 3 or more times per week (CDC, 2006b.). Information on college women and physical activity is discussed in more detail in the following sections.

Stress Levels. Another environmental factor that is influential in the development of overweight and obesity is stress. Stress can trigger several biological changes within the body resulting in increased fatty materials (McEwen & Lasley, 2002). Stress may be an important factor for college women, who juggle several roles at once. During stressful situations, such as before midterm or final exams, the hormones adrenaline and cortisol may rise, resulting in the breakdown of proteins into glucose (McEwen & Lasley). Thus, the body begins providing more energy than may be needed. Furthermore, after long durations of high levels of cortisol and adrenaline, the body can become insulin resistant and result in the buildup of lipids or triglycerides in the blood (McEwen & Lasley). Students in the “stressful” environment of college may experience increased deposits of adipose tissue as a product of this process.

Alcohol Consumption. Other environmental factors associated with weight gain are alcohol consumption and some medications. Alcohol has been shown to have differing effects on weight depending on level of consumption (Agarwai & Seitz, 2001). For example, moderate use of alcohol may have a protective effect on heart disease risk factors (i.e., a glass of red wine per day), but excessive use with high caloric values may lead to an increase in weight (Agarwai & Seitz). Although this assertion is logical, other aspects of an individual’s metabolism, genetics, etc. can provide differing effects with alcohol consumption (Agarwai & Seitz). For example, variations in metabolic rate will result in differing amounts of calories from alcohol resulting in fat deposits. Overall, the current consensus is that alcohol use in moderation will not cause an individual to be obese. However, excessive usage can promote weight gain and other harmful effects.

Drug Consumption. Drug consumption is an important topic for the college population. Findings between drug consumption, overweight status, and sexual behavior allude to the powerful effects of drug consumption. Eisenberg, Neumark-Sztainer, and Lust (2005) reported that 21% of overweight, college females in their study engaged in a sexual act while being intoxicated (drugs or alcohol) compared to only 9% of normal weight women. Therefore, exploring the role of some drugs and weight gain is an important topic.

The substance, *Cannabis sativa* (marijuana) and its appetite-inducing properties have been known for centuries (Cota et al., 2003; Marzo & Matias, 2005). Cannabinoids, the main component responsible for inducing the increased appetite sensation in marijuana, has been studied to aid in obesity and eating disorder conditions (Cota et al.). Studies allude that suppressing the cannabinoid system in obesity may decrease food consumption and vice versa in eating disorders (Cota et al., 2003; Marzo & Matias, 2005). However, for the college population, consuming excessive amounts of marijuana could lead to excessive weight gain as cannabinoids will cause an increase in appetite, particularly for “sweet and palatable foods” (Cota et al., 2003, p.289).

Medications. Similarly, medications have also been shown to promote obesity rates. Particularly, many psychotropic drugs are associated with changes in body fat mass (Andersen, 2005; Correll & Carlson, 2006; Halford, Harrold, Lawton, & Blundell, 2005; Malone, 2005; Ruetsch, Viala, Bardou, Martin, & Vacheron, 2005; Theleritis et al., 2006; Young & Rozen, 2005; Zimmerman, Kraus, Himmerich, Schuld, & Pollmacher, 2003). These psychiatric drugs include antidepressants, mood stabilizers, and antipsychotic

medications. Distinctively, the dosage and treatment of tricyclic antidepressants (TCA) were positively correlated with weight gain, particularly with the drug amitriptyline (Ruetsch et al.). Mood stabilizers such as lithium and valproate tend to have the most drastic effects, and the antipsychotics, clozapine and olanzapine also have the most drastic effects with increased risks for diabetes and dyslipidemia (Ruetsch et al.). Also, the off-label use of psychotropic drugs may be increasing. Haw and Stubbs (2005) surveyed patients with mild intellectual disabilities, and found that 46.4% were receiving off-label psychotropic drugs. In general, physicians must take care when diagnosing an individual with a singular problem that may cause a domino effect for other conditions. Likewise Radley, Finkelstein, and Stafford (2006) investigated the prescribing of off-label drugs, and found that off-label use was most common among cardiac medications (46%, excluding antihyperlipidemic and antihypertensive agents) and anticonvulsants (46%), whereas gabapentin (83%) and amitriptyline (81%) had the greatest proportion of off-label use among specific medications. Thus, Radley et al. affirm that the usage of psychotropics is not limited to psychiatric conditions, but is also being used for other conditions.

The aforementioned information provides a foundation for understanding the multifaceted etiological aspects of obesity. Although it may seem that an imbalance in energy intake and expenditure are at the origin for most individuals, there may be several other factors to take into consideration. Nonetheless, this framework helps provide a snapshot of the vital dynamics involved in the progression of weight gain.

Current Weight-related Health Behaviors of College Students

Weight behaviors are quite complex and several factors may influence the health choices that young adults make on college campuses. Therefore, this section explores the current weight-related behaviors that college students may encounter, develop, or experience. Particularly, college students' current nutritional, physical activity, psychological, and tobacco and drug use behaviors are examined.

Nutritional Intake

Eating Behaviors

Behavioral patterns and choices provide the most insight for understanding the nutritional habits of college students. Davy, Benes, and Driskell (2006) investigated college students' dieting trends, eating habits, and nutrition belief differences among men and women. The researchers recruited 105 male and 181 female undergraduate students (8% freshman, 73% sophomores and juniors, and 19% seniors) to complete a 21-item questionnaire. This survey assessed each student's self-reported height and weight to calculate BMI, use of popular specific diets such as the Atkins diet, sources of nutrition knowledge, individuals with whom the participant regularly ate meals, location of meals, and nutrition self-assessment and beliefs.

Davy et al. (2006) reported the following results: 76.7% of the women were normal weight, 12.5% were overweight, and 3.4% were obese. Diet choices for women included a diverse range: 6.6% Weight Watchers, 19.3% low-fat diets, 15.5% low-carbohydrate diets, and 4.4% vegetarian. Women participants also documented diverse

sources of nutrition information (the most cited sources are listed in descending order): family members, classes, magazines or newspapers, friends, instinct, physician, books, other health professionals, registered dietitians, and others. Interestingly, the most accurate sources for nutrition information (such as registered dietitians) are among the least utilized sources. Also, most students (49%) reported eating lunch and dinner with friends, while most students (58%) reported eating dinner at home. It is also important to note that the study was conducted at a university where the majority of students (76%) live off campus. This helps to explain why most students in the study reported eating at home for dinner. Lastly, 66.4% of students believed that a healthy diet “included more fruits and vegetables, contained less fat, and was balanced” (Davy et al., 2006, p.1676).

Davy et al. (2006) helped to clarify the nutritional behaviors and beliefs of young women in a college environment. At this Midwestern university, most students were of a healthy weight and aware of the consistency of a healthy diet. However, the most revealing data concerns the sources of information for students. It is clear that most (60%) rely on their family for nutrition information, which may or may not be accurate. Also, it is clear from this study that the most knowledgeable sources of nutritional information are underutilized by this population.

A complementary study also examined the nutritional beliefs, definitions, and attitudes of university students (House, Su, & Levy-Milne, 2006). The scientists recruited 15 female, third and fourth year undergraduates the students from a Canadian university (9 students were dietetics students and 6 were from other departments).

Researches used the sample of participants to conduct four focus groups which guided by five questions. These five questions referred to defining unhealthy foods, influences on food choices, sources of nutritional information, and benefits and barriers to healthy eating. Also, the beginning of each focus group required that students create a pictorial representation of healthy eating by using poster board, magazines, and crayons.

House et al. (2006) reported that participants in all focus groups used the four food groups in their illustrations (based on Canada's Food Guide to Healthy Eating). The linearity of this result brings into question the impact of peer influence on the depicted drawings, or may be a result of diligent advertising on the part of the Canadian government concerning nutritional health. Furthermore, all participants aligned unhealthy eating with specific types of foods: high fat, saturated fat, high calories, fried, and processed. Students also reported influences on food choices, barriers and benefits of healthy eating, and sources of health information. These results show that most influences were centered on family and culture. The most prevalent barrier was time and finances. Benefits were described as "appearance, healthy weight, glowing skin, and physical physique" (House et al., 2006, p.16). Lastly, participants reported family as the most important sources of health information, paralleling the findings of Davy et al. (2006) discussed earlier.

Likewise, Debate, Topping, and Sargent (2001) assessed the nutritional intake, weight status, and dietary practices of 630 college students (n = 191 males and n = 439 females). The sample consisted of 66% Whites and 23% African Americans. Hispanics were removed from the analysis due to the small number of participants (Debate et al.).

Students were attendees at a southeastern university that completed a 37-item questionnaire including information about body composition (self-reported height and weight), diet behaviors, meal frequency, food variety, eating attitudes, and body image. The survey was a combination of new items and existing tools (Debate et al., 2001). The researchers also had students complete report of food consumption within the last 24 hours “by using the groups identified by the Food Guide Pyramid...” (Debate et al., 2001, p.821). Debate et al. found low percentages of recommended levels of fruit and vegetable consumption among White and African-American women: only 32.5% and 26.1% of both respective groups consumed the minimum recommendation of fruit, and 1.6% and 0.8% of both respective groups consumed the minimum recommendation of vegetables. Also, Debate et al. reported that African Americans were significantly less likely to consume breakfast ($p < 0.002$), lunch ($p < 0.006$), and late-night snacks ($p < 0.003$) than Whites. Likewise, African Americans reported significantly higher consumption rates of fast food than Whites ($p < 0.001$).

Debate et al. (2001) alludes to the fact that college participants as a whole may not be consuming adequate amounts of fruits and vegetables. Furthermore, the study also highlights distinct nutritional differences among African Americans and Whites, which may place African Americans at a greater risk for weight gain. Understanding these nutritional decision differences may help structure nutritional interventions within each group.

Furthermore, Nicklas, Myers, Reger, Beech, and Berenson (1998) evaluated ethnic and gender differences associated with breakfast consumption patterns using a

cross sectional survey of young adults aged 18 to 28 years old (mean age = 23 years old) from the Bogalusa Heart study. The total sample of eligible participants ($n = 504$) consisted of 58% women and 70% White young adults. Researchers compared responses among four divided groups: White men, White women, African-American men, and African-American women.

In order to accomplish the study purpose, researchers used 24-hour dietary recall to assess the nutritional patterns of the young adults. Unlike the DeBate et al. (2001), Nicklas et al. (1998) did not find significant ethnic or gender differences in breakfast consumption. However, they did report differences in food choices consumed at breakfast. A significantly higher percentage of African Americans than Whites consumed fruit juices ($p < 0.05$), breads ($p < 0.001$), sausage, bacon, or salami ($p < 0.001$), hot dogs, ham, or lunch meats ($p < 0.05$), grits or oatmeal ($p < 0.05$), and yogurt or a supplementary breakfast beverage ($p < 0.05$). Lastly, 74% of women that skipped breakfast did not meet two-thirds of the Recommended Dietary Allowances (RDA) compared to those women who did consume breakfast (Nicklas et al., 1998).

These findings help to further clarify dietary patterns among college women. More so, the data reveal differences between dietary patterns among African-American and White women. Once again, affirming the need to clearly understand dietary choices and patterns between different ethnic groups in order to help facilitate various interventions.

Similarly, Driskell, Meckna, and Scales (2006) recruited 113 men and 113 women (19 years old or older, 13% freshmen, 24% sophomores, 44% juniors, and 19% seniors)

from a large midwestern land-grant university introductory nutrition class to investigate fast food restaurant habits. The researchers developed a 2-page survey using previously published findings, but no information was presented about the setting of the study environment of the survey takers. The 10-item survey used a Likert-type scale and provided a detailed definition of fast food. Students were questioned about age, gender, frequency of fast food intake for each meal (breakfast, lunch, dinner, and snack), frequency of visits to fast food restaurants, types of beverage consumed with the meal, primary reasons for choosing fast food, how much of the food they consumed based on satisfaction (eating until satisfied, eating everything ordered, or both), portion sizes ordered and why they made this selection, influence of nutritional information on fast food choices, and frequency of choosing options at fast food restaurants that students considered healthier.

After reviewing students' responses, Driskell et al. (2006) analyzed data by gender using the χ^2 test, and found that 95% of women typically did not eat fast food for breakfast, 58% of women reported eating fast food for lunch at least once per week, and 82% of all participants reported eating fast food for dinner at least once weekly. Other frequencies of fast food consumption were not reported. One of the most illuminating, but not surprising results was that 71% of all participants reported limited time as a reason for consuming fast food. Also, 41% of the participants reported taste enjoyment as a primary reason for consuming fast food, and 34% of women stated that a primary reason for consuming fast food was to eat with family and friends. The researchers found that 53% of women considered smaller portion sizes, and 35% were influenced by

nutritional information most of the time while making food choices. Women selected healthier portions with the following frequencies: not at all (2%), rarely (18%), sometimes (51%), most of the time (24%), and always (5%).

Overall, the nutritional findings presented elucidate the internal conflicts that women face as they make food selections: debating health information, balancing time, reconciling culture and family influences, overcoming barriers, and meeting taste preferences. It is evident from the presented data that nutritional intake is a multifaceted behavior influenced by several important factors. These studies also help reveal the current nutritional behaviors of university women, but also suggest that geographic differences (which may be attributed to cultural differences within regions of the United States) play an important role in nutritional behaviors and thus influence obesity rates.

Dysfunctional Eating

The transitional period from childhood to adulthood can be a difficult phase in a young person's life. This phase can include many unhealthy choices, and for this reason dysfunctional behaviors involving nutrition are also explored. Disordered eating encompasses conditions such as anorexia nervosa, bulimia nervosa, compulsive overeating, binge eating, but also includes several syndromes such as night eating syndrome. However, rather than defining all dysfunctional eating disorders, it is practical to define normal eating. Yancey (1999) reported that the following characteristics indicate normal eating patterns:

1. Eating something at least three times a day, with snacks
between as guided by one's appetite
2. Eating a wide variety of foods as part of a balanced and
flexible diet
3. Eating more of the food you enjoy when you wish
4. Eating less than you need on some occasions
5. Not eating for emotional reasons
6. Eating in a flexible way so that it does not interfere
with your work study, or social life, and vice versa
7. Eating, when socially out, in a similar manner to the
other people in the group
8. Eating at fast-food outlets occasionally when you wish
to or are with friends
9. Being aware that eating is not the most important thing
in life, but that it is important for good health and
physical and mental wellbeing
10. Being able to prepare food for yourself and others
without feeling anxious
11. Knowing what portions of food and size meals are
appropriate in different circumstances

Although this list identifies many normal eating behaviors, it is not inclusive of all behaviors, environments, or populations. In other words, identifying or labeling

dysfunctional eating should not be solely based on this list, but the characteristics do provide a framework for identification of abnormal behaviors that will be explored.

The prevalence of disordered eating in the college population has been documented by several authors (Edwards-Hewitt and Gray, 1993; Hoerr, Bokram, Lugo, Bivins, & Keast, 2002; Lester and Petrie, 1998; Striegel-Moore, Silberstein, & Rodin, 1989). In the early eighties, prevalence estimates of the symptoms of eating disorders in college females ranged from 90% for binge eating and 12% for vomiting (Striegel-Moore et al.). Striegel-Moore and colleagues studied the prevalence of disordered eating among college students (590 males, 450 females, 80% Caucasian) at the beginning and end of the freshman year at an elite private university. Their study assessed self-reported body weight; weight dissatisfaction (by subtracting desired weight from current weight); feelings about weight (using the Feelings About Weight five-item scale); perceived attractiveness (by rating personal attractiveness compared to peers on a seven point scale); symptoms of disordered eating (using the Disordered Eating Symptoms Scale (DESS) items from the Eating Disorders Inventory). Similarly, self-created scales were to measure the frequency of binge and purge behavior, perfectionism and ineffectiveness. Work and family orientation was measured using the Work and Family Orientation Questionnaire to assess work attitude, competitiveness, and concern or unconcern for others reactions to personal success, and lastly perceived stress was measured with the Perceived Stress Scale (PSC).

Striegel-Moore et al. (1989) revealed that at the beginning of the freshman year 3.8% of females in their study met all the criteria for bulimia nervosa compared to only

0.2% males. A total of 43.4 percent of the female students had a history of binge eating and 12.2 percent used purging at some time to control weight. Furthermore, Striegel-Moore et al. found significant changes in dieting behavior during the first year: women who were initially were not bingers were likely to begin this activity by the end of the year ($\chi^2 (1) = 4.21, p < 0.05$) and the occurrence of dieting behaviors was likely to increase as well ($\chi^2 (1) = 27.88, p < 0.001$).

Hoerr et al. (2002) also evaluated the frequency of disordered eating behaviors, the relationship of disordered eating behaviors and gender, ethnicity, and participation in social and sports organizations, and lastly whether body weight was associated with high responses on the Eating Attitudes Test (EAT-26). The researchers collected a convenience sample of students in residence halls, sororities, and academic classes. Surveys were distributed to students at these sites and 67% of the surveys were returned. The researchers slightly modified the EAT-26 by adding 6 questions, and BMI was calculated by self-reported height and weight.

Hoerr et al.'s (2002) sample used for statistical analysis consisted of 1620 males and females (81.4% Caucasian, 74% female, 6.6% African American females, and 60% freshman or sophomore students). 4.5 percent (4.3% Caucasian, 3.5 African American) of female students reported previous treatment for an eating disorder, 10.9% (11.1% Caucasian and 6.3% African American females) were at risk for an eating disorder, 16.3% (17.1% Caucasian and 3.8% African American females) have binged, 10.3% (10.8% Caucasian and 8.9% African American females) have purged, 18.6% (19.7% Caucasian and 15.2% African American females) used laxatives, diet pills, or diuretics,

36.3% (36.9% Caucasian and 36.7% African American females) experienced weight cycling, and 8.6% (8.3 Caucasian and 8.9% African American females) experienced suicidal thoughts. Correlations revealed that African American women and Caucasian women had the same risk factors for disordered eating, except for bingeing, which was correlated for African American, and BMI that was not correlated for African American. Hoerr et al.'s (2002) results suggest that risk factors for Caucasian and African American women may be different, but also have similar characteristics.

Finally, Lester and Petrie (1998) evaluated the prevalence of disordered eating behaviors and bulimia nervosa among female, Mexican American college students. Participants were enrolled in a general undergraduate psychology course, graduate educational, psychology courses, and Hispanic student organizations at three large, southwestern, public universities. The students mean age was 27.05, 60% were not married, 21.5% were first and second year undergraduates, and 54% were undergraduates. The prevalence of disordered eating and bulimia was determined by using the 36-item Bulimia Test-revised (BULIT-R). Using a BULIT-R score greater than 104 as a diagnosis criteria, Lester and Petrie found that 1.4% of the participants were at risk for bulimia nervosa or using the diagnostic score of 98 increased the at risk percentage to 4.3%. Similarly, 11% of the participants binge ate in two or more times per week, 12.2% exercised one or more hours per day, 25.9% fasted or went on strict diets at least twice in the past year, 5.7% used diuretics at least once a month, and 2.9% used laxatives at least two or three times per month. These findings suggest that Mexican American women may suffer from similar patterns of eating disorders as many of their

counterparts.

The nutritional behavioral patterns, choices, and disorders described above all reveal the complexity that college women may face in adopting healthy eating behaviors. These data further emphasize the need to collaborate with college aged women in promoting better health choices. Thus, to provide a conclusive picture of weight-related behaviors, the current physical activity patterns of college women are also explored.

Physical Activity Levels

Researchers assessing physical activity among the college population reported frequencies of exercise both above and below national recommendations (Buckworth & Nigg, 2004; Clement, Schmidt, Bernaix, Covington, & Carr, 2004; Hendricks, Herbold & Fung, 2003; Juniper, Oman, Hamm, & Kerby, 2004; Suminiski, Petosa, Utter, & Zhang, 2002). This suggests that many factors may influence exercise behaviors among the college population. These differences become evident in the studies presented below.

Juniper et al. (2004) analyzed the relationships among the Health Belief Model and Transtheoretical Model concepts and differences in perceptions of physical activity among African-American college women. The researchers recruited participants from three Oklahoma universities via African-American organizations such as sororities and academic clubs. The participants of the study were all African-American students between the ages of 18 to 30 (mean age = 20.6, SD 2.11). The other descriptive characteristics of the sample included: 32.6% seniors, 98% full time students, 96% single, and 48% working part time.

Juniper et al. (2004) grouped respondents by self-reported stage of regular

physical activity: precontemplation, contemplation, preparation, action, and maintenance. Prochaska, Redding, and Evers (1997) defined these stages as the following: An individual in precontemplation has no intention to take action within the next 6 months. The contemplation stage indicates one that intends to take action within the next 6 months. A person in the preparation stage intends to take action within the next 30 days and has taken some behavioral steps in this direction. Lastly, an individual in the action stage has changed behavior for less than 6 months, and a person in the maintenance stage has changed behavior for more than 6 months. The classification breakdown among the sample was precontemplation (3.9%), contemplation (18.0%), preparation (32.2%), action (18.0%), and maintenance (27.9%).

After grouping participants by current physical activity stage, as described above, Juniper et al. (2003) conducted a focus group with 6 participants (their individual stages of change were not reported) to “identify African-American college women’s salient perceptions of physical activity that could represent Health Belief Model constructs” (Juniper et al., 2003, p.355). This information was used to transform survey items to properly fit the sampled population. The Cronbach alphas for each Health Belief Model construct were between 0.76 and 0.92.

Juniper et al. (2003) found that the inactive groups (precontemplation and contemplation) were significantly different ($p < 0.05$) from the active groups (preparation, action, and maintenance) in their perception of barriers, severity, cues to action, and self-efficacy (Juniper et al.). Perceived barriers were significantly higher in the inactive stage, while the other areas (severity, cues to action, and self-efficacy) were

significantly lower in the inactive stage. Thus, from the data gathered it is clear that the individuals in the inactive stage may have recognized the benefits of physical activity (no significant differences for benefits among the stages), yet perceived higher barriers, and also lacked the self-efficacy and confidence to pursue physical activity behaviors.

Suminski et al. (2002) also studied physical activity among ethnically diverse college students at a university located in the south central region of the United States. The researchers sampled participants between the ages of 18 to 25 from a required (all students must register for the class) health and fitness course. The sample consisted of 2,836 and was distributed as follows: 874 (31%) Asian, 332 (12%) African, 1,101 (39%) White, and 529 (19%) Hispanic. Furthermore, 60% of the sample was female, 88% of the students commuted to school, and 74% worked while attending school. Using this sample, the researchers analyzed rates of physical activity.

Suminski et al. (2002) designed a cross-sectional study that collected data during all three terms of the semester for one year: fall, spring, and summer. Participants completed questionnaires during regularly scheduled class time. Two questionnaires were administered, the Self-Report of Physical Activity (SRPA) Questionnaire and the Health/Lifestyles and Demographics Questionnaire, and participants height and weight was also measured to obtain BMI data. The SRPA Questionnaire assessed global self-ratings of physical activity for the last month in order to estimate current physical activity behaviors (Suminski et al.). While the Health/Lifestyles and Demographics Questionnaire contained demographic information and the health/lifestyle sections obtained current health data (e.g. "do you have any heart trouble?"), weight lifting data,

TV-viewing data, and youth physical activity data (Suminski et al., 2002, p.76).

Suminski et al. (2002) found that 53% of women did not engage in vigorous physical activity during the last month and 22% of women did not engage in any physical activity during the last month. Likewise, 28.1% Asian, 23.5% African American, 17.4% White, and 20.3% Hispanic women reported no physical activity within the last month as well. A more revealing result for women was that African American women reported significantly higher hours of television watching than Asian ($p < 0.05$) and White ($p < 0.001$) women in the study. Thus, the researchers concluded that there is some inactivity among various groups of women.

On the other hand, some researchers reported higher rates of physical activity among college women (Clement et al., 2004; Hendricks, Herbold, & Fung, 2004; Buckworth & Nigg, 2004). Clement et al. researched the relationship between levels of physical activity, health attitudes and behaviors, and obesity in women attending a midwestern university. The researchers surveyed 116 women between the ages of 18 and 24 (mean age = 20.46, 96% undergraduates, 97% unmarried, 78% White, and 55% lived on campus). Clement et al. conducted a cross-sectional and descriptive study using self-administered questionnaires and physiological measurements. Researchers used one 33-item Health Behavior Survey (HBS) to collect demographic information (9 items), nutritional behaviors and attitudes (10 items), physical activity behaviors and attitudes (5 items), individuals' stage of physical activity and exercise as described by Prochaska's Theoretical Model (4 items), and lifestyle behaviors, such as alcohol consumption (5 items). Trained technicians also measured each woman's height, weight, and blood

pressure to obtain physiological data on each participant. Two different scales were used to calculate BMI based on the participants age. The CDC Table for Calculating Body Mass Index Values (Department of Health and Human Services, 2000) was used for participants 18-20 years old, and the Quetelet Index was used for participants 21-24 years old.

Self-reported levels of physical activity were greatly above National College Health Risk Behavior Survey and National College Health Assessment results (Clement et al., 2004; Douglas et al., 1997; American College Health Assessment, 2006). Clement et al. reported that 72.4% of students reported that they engaged in exercise or physical labor 3 or more times a week compared to a national average of 19.5% (Douglas et al.). Similarly, 46.6% students reported engaging in vigorous physical activity 3 or more times per week compared to the national average of 43.6% (American College Health Assessment).

Clement et al. (2004) also described Prochaska's stage of physical activity from data collected. Eight-tenths percent of the sample reported information consistent with the precontemplation stage, 17.2% contemplation, 23.3% preparation, 38% action, and 20.7% maintenance. These percentages help to support the high levels of exercise reported by students. Although these results suggest that some college women may be engaging in sufficient amounts of physical activity, there are also some areas of caution. For example, of the studies reported here, Clement et al. has one of the lowest sample sizes, and utilized a self-created survey. Nonetheless, this instrument did have high internal consistency reliability (Cronbach alpha = 0.94). These inconsistent results do

hint at the need for consistency of physical activity assessment within the literature.

Correspondingly, Buckworth and Nigg (2004) studied physical activity, exercise, and sedentary behaviors in college students. Students enrolled at a large midwestern university participated in the study (58.3% women, 73.8% White, 16.2% African American, 3.8% Asian, and 2.2% Hispanic). Students who were involved in the study were enrolled in elective conditioning activity classes through the fall (6 classes, N=215) and spring (4 classes, N=278). The classes included “50 minute lecture and 45-minute exercise labs 3 times per week” (Buckworth & Nigg, 2004, p.29). The participant enrollment was as follows: aerobic dance (44%), weight training (39%), and jogging classes (16%).

The quantitative study utilized questionnaires during the first lecture of class to obtain demographic information (gender, ethnicity, academic, and class), exercise behavior information (questions were adapted from the National College Health Risk Behavior Survey (NCHRBS) to obtain data amount of exercise, duration, and type within the last 7 days), physical activity history (the CARDIA Physical Activity History Questionnaire was used to obtain information about physical activity behavior in the last 12 months), and sedentary behaviors information (3 questions were adapted from previous studies to measure sedentary behaviors such as watching television and or videos, studying, and using the computer) (Buckworth & Nigg, 2004).

Buckworth and Nigg (2004) reported noteworthy results concerning women. These researchers found that women spent 28.43 hours engaged in sedentary behaviors, 2.45 per week engaged in vigorous exercise, and the average frequency of exercise

behavior was 3.10 days per week. Compared to the national sample obtained by the NCHRBBS, students in this study were more involved in vigorous activity for 3 or more days per week (53.2% vs. 37.6%) (Buckworth & Nigg; Douglas et al., 1997). These higher results may be due to the fact that the sample was drawn from elective physical activity courses. Contrarily, results from this study also showed that female students' age was negatively correlated with exercise; as women increased in age, their frequency of exercise decreased (no statistical coefficient provided). Thus, there are areas of improvement for decreasing sedentary behaviors in women, and increasing vigorous exercise.

Keating et al. (2005) also studied exercise behaviors among the college population through a meta-analysis of current literature. They found that as many as 30% to 50% of college students do not engage in enough physical activity to accrue health benefits (Keating et al.). Even more surprisingly, they reported that the college population's physical activity behaviors have been understudied. They found that there is a lack of multifaceted approaches (such as personal, psychosocial, and environmental), and that current measures of physical activity are subjective and inconsistent, such as self-reported exercise intensity (Keating et al.). Many of the above inconsistencies make it difficult to compare across various samples and populations.

Overall, the researchers allude to a pervasive problem of behavioral studies—understanding behavioral patterns while examining studies that use different sampling methods and procedures. However, the presented studies provide a picture of exercise behaviors and patterns among college women. The inconsistencies across studies

highlight the future efforts that must be made to ensure validity and reliability of findings.

Psychological Health

Psychological health can impact several aspects of a person's life including the maintenance of a healthy weight. College counseling centers currently report that today's students are more distressed, disturbed, or unwell compared to past years (Schwartz, 2006). Thus, it is important to understand the current state psychological state of college women and how this component of health may be affecting other weight-related health variables.

Schwartz (2006) utilized secondary data from 1992-1993 through 2001-2002 collected at a medium-sized, private northeastern university counseling center to analyze distress levels and character of psychopathology across the identified decade. The sample included 3,410 students who visited the counseling center during the outlined years (38.6% undergraduate women, 20.2% undergraduate men, 25.1% graduate women, 16.1% graduate men, 63% all women, 36.3% all men, 58.7% all undergraduates, and 41.3% all graduate students).

The study included quantitative and qualitative data from the Personality Assessment Inventory (PAI) instrument (Schwartz, 2006). The PAI includes 344 survey items that assess "actuarial indices of the severity of student pathology" (Schwartz, 2006, p.328). Students were scheduled to complete the PAI before any sessions occur, but only a "modest majority" was actually carried out in this manner (Schwartz, 2006, p.329). Most surveys were completed an hour before the first session.

Swartz (2006) reported that clients did not become more acutely distressed over the ten-year period. However, the prescribing of psychotropic medications did increase. More so, therapists' perception of increasingly distressed clients may be established without sufficient data. These findings may also be associated with some weight-related issues, such as weight gain experienced by individuals taking prescribed psychotropics. Many of these drugs are known to cause weight gain (Ruetsch et al., 2005; Zimmerman et al., 2003; Theleritis et al., 2006; Correll & Carlson, 2006; Malone, 2005; Andersen et al., 2005; Halford et al., 2005; Young, 2005). Thus, the actual degree to which students were distressed may not have changed significantly over the decade studied, but therapists' perceptions of distress and frequency of medication distribution appears to be increasing.

Depression

Although it is not evident whether students' psychological status has declined over the last ten years, reported symptoms of depression among the female college population are not as inconclusive. It has been reported that individuals between the ages of 15 and 24 are the most likely to have experienced an episode of depression within the last month (Michael, Huelsman, Gerard, Gilligan, & Gustafson, 2006). Thus, it is predicted that many psychological illnesses may first occur during the college years (Michael et al.). Rates of depressive symptoms among undergraduate women have been reported to be as high as 48.1% (Michael et al.). Thus, understanding the impact depressive symptoms on weight-related behaviors is an important endeavor.

Self-esteem

Self-esteem and its relationship to weight-related behaviors is abundantly reported in research literature (Dunkley & Grillo, 2007; Heyerdahl & Halvorsen, 2006; Jones, Moulton, Moulton, & Roach 1999; Klaczynski, Goold, & Mudry, 2004; Miller & Downey, 1999; Rubinstein, 2006; Thompson et al., 2007). Researchers aim to understand the impact of self-esteem on eating and exercising behaviors. The elusive question remains: Does self-esteem act as a protective factor against unhealthy or dysfunctional weight-related behaviors?

Jones et al. (1999) investigated the relationship between weight, diet preoccupation, and self-esteem among Black and White college females ($n = 275$; $n = 205$ White; $n = 70$ Black) at a midsized, rural, southern university. Participants were undergraduates between 18 and 49 years old (mean age was 21.95), and volunteered to be a part of the study in exchange for extra credit in a psychology or health course. Survey completion lasted approximately 45 minutes. In order to assess the defined variables in the population, researchers utilized three survey instruments: the Rosenberg Self-Esteem Scale, the Eating Disorder Inventory, and a demographic sheet (Jones et al.).

The Rosenberg Self-Esteem Scale is a 10-item instrument that measures global self-esteem (Jones et al., 1999). While the Eating Disorder Inventory contains 8 subscales that measure psychological and behavioral traits related to anorexia nervosa and bulimia nervosa (Jones et al.). In the current study, only three subscales were utilized: drive for thinness, bulimia, and body dissatisfaction. Lastly, the demographic survey was used to ascertain population characteristics such as current and ideal weight.

Jones et al. (1999) showed that there was a significant difference between Black and White females' self-esteem scores ($p < 0.05$), but also that race was not a significant predictor of self-esteem ($p = 0.059$). However, weight and diet preoccupation explained 17.73% of the variance (0.174 adjusted r^2) in self-esteem scores of Black and Female students. Furthermore, "weight and diet preoccupation did not differ significantly in its impact on Black versus White women's self-esteem (Jones et al., 1999, p.53). Thus, the researchers found that there may be significant differences in self-esteem among ethnicity groups, and that self-esteem may affect the weight and diet behaviors of many young women.

On the other hand, Klaczynski et al. (2004) studied self-esteem and weight-related issues while evaluating cultural and society influences. The researchers examined "the relationships among negative stereotypes of obesity, thin ideal beliefs, perceptions of the causes of obesity and of control over weight, body esteem, and global esteem" (Klaczynski et al., 2004, p.307). Participants (17 male and 90 female; mean age = 19.23; $SD = 1.11$) were undergraduates from a large, northeastern university enrolled in introductory psychology classes. Students completed eight surveys and self-reported height and weight measures. The eight instruments used to obtain measures were the Rosenberg Self-Esteem Scale, the Mendelson and White Body Esteem Scale, the Causes of Obesity Scale, the Antifat Attitudes Questionnaire, the Obese Stereotypes Scale, the Sociocultural Attitudes Toward Appearance Questionnaire, the Personal Control over Weight Scale, and the PAM verbal meaning test.

The Rosenberg Self-Esteem Scale is a 10-item instrument that measures global self esteem using a 4-point likert scale (Jones et al., 1999). The Mendolson and White Body Esteem Scale is a 23-item tool that assesses “the extent to which a person has positive feelings and beliefs about his or her physical characteristics, particularly those characteristics related to attractiveness” using a 5-point likert scale (Klaczynski et al., 2004, p.310). The Causes of Obesity Scale evaluates beliefs about the causes of obesity with subscales (internal causes, physical causes, and social causes), and contains 31 items with a 4-point likert scale. The Antifat Attitudes Questionnaire is an 18-item, 6-point likert scale instrument that measures attitudes and stereotypes concerning obesity. The Obese Stereotypes Scale is a 40-items instrument that utilizes a 4-point likert scale to evaluate beliefs about personalities if obese individuals. The Sociocultural Attitudes Toward Appearance Questionnaire is a 15-items instrument with a 5-point likert scale that assesses prevailing cultural beliefs about thinness. The Personal Control over Weight Scale is a 10-item instrument with a 4-point likert scale that measures the extent to which individuals’ believe that their weight is controlled by their actions. Lastly, the PMA verbal meaning test was used to obtain information on participants’ vocabulary in order to assess global intelligence (Klaczynski et al.).

Klaczynski et al. (2004) reported several relationships between self-esteem and the examined variables. Self-esteem accounted for 43.6% (0.4356 adjusted r^2) of the variance in body self-esteem scores among the participants. The authors reported a negative zero order correlation between self-esteem and BMI ($r_s = -0.42$). Thus, this study also affirmed that a strong relationship exists between weight and self-esteem.

Stress

The college transition provides many opportunities and environments that can lead to stress in students. In 2003 the National College Health Assessment was used to survey college students about their lifestyles. Students who participated in the study identified stress as the greatest hindrance to academic performances. Long duration of severe stress is linked to dysfunction of the cardiovascular, respiratory, and immune systems (Launier, 1997). Thus, it is important to examine the effect of stress on college students' health.

Launier (1997) examined stress balance and emotional life in students from a historically African American college on the east coast of the United States. A total of 200 students were recruited via four methods: psychology classes, dormitory residents, student volunteers from a community mental health fair at the college, or upperclassmen from a measurement and assessment class. The participant demographics were as follows: ages ranged from 18 to 69 (mean age = 22), 95% African American, 66.5% female, 47% freshmen, 28% sophomores, 13% juniors, and 12% seniors. Launier used the Emotology Q-Deck (EQD) instrument to measure patterns of emotional life and stress balance and a 12-item questionnaire was used to measure lifestyle health habits. The EQD survey consists of 70 items and utilizes a 7-point likert scale, while the 12-item lifestyle health habits questionnaire used a 6-point likert scale.

The most common and severe stress reported among students was financial. More so, the most prevalent stress-related emotions were "feelings of seriousness, pressure, frustration, worry, and exhaustion" (Launier, 1997, p.180). Lastly, the average

stress balance was 67%. This percentage means that majority of students' emotions were positive. Although students balanced a multitude of stressful emotions, a positive outlook outweighed the negative.

However, Launier (1997) found a high negative correlation ($r = -0.52$) between physical symptoms and emotional stress balance among women. Thus, students' stress balance was predominantly positive, but the stress that women experienced negatively impacted their physical health. These results suggest that women may be doing well at not allowing stress to overwhelm, but still experiencing unhealthy physical symptoms as a result of stress.

Likewise, Dusselier, Dunn, Wang, Shelley, and Whalen (2005) stated that stress is the culprit of many symptoms seen in the college population, such as fatigue, hypertension, headaches, depression, and anxiety. Dusselier et al. conducted a 76-item survey with undergraduate residence hall students at a land grant university in the Midwestern United States. The survey consisted of questions concerning demographics, attitudes and opinions concerning the resident hall and staff, overall health questions adapted from the NCHA survey, relationships, drug use, and sleep difficulties. The authors randomly selected 964 students participate in the web study and 462 participants responded. Women and U.S. citizens experienced higher levels of stress than men and non-U.S. residents. Several factors such as "chronic illness, depression, anxiety disorder, seasonal affective disorder, mononucleosis, and sleep difficulties were predictors of stress as evidenced by backward elimination regression analysis (Dusselier et al.)

Overall, these studies affirmed that stress is an evident and pervasive factor in college women's lives. Furthermore, it appears that the levels of stress that students are experiencing have had negative impact on their physical and mental well-being. Stress appears to be an important factor, affecting many areas of women's lifestyle, particularly weight-related behaviors.

Tobacco and Drug Use

Over the last years tobacco and drug use among the college population steadily rose (Lenz, 2004; White, Becker-Blease, and Grace-Bishop, 2006). It appears that the complex web of issues surrounding the college population's health behaviors is deeply interconnected. For example, Lenz (2004) reported that the factors associated with tobacco use included "other drug use, stress, smoking environment, lifestyle factors, mental health factors, and dieting and weight control" (p.213). This analysis suggests that weight and health issues in the college population cannot be addressed from a one dimensional perspective, but also magnifies the many influences that affect college health. Likewise, Lenz analyzed secondary data from the 2001 College Health Survey and found that of the 203 participants (88% were Caucasian and 60.6% were women in their first or second year in college) students who were diagnosed or treated for depression in the past were 7.5 times more likely to be tobacco users, stress was identified as a motivational factor for 49.3% of the current smokers, and alcohol (OR = 1.6, $p < 0.001$) and marijuana (OR = 1.7, $p < 0.001$) use were found to be significant with tobacco use. Lastly, Lenz found that as students' current fitness level, fitness since high school, and consumption of fruits and vegetables decreased, tobacco use increased.

Similarly, White et al. (2006) found misuse and abuse concerning stimulant medications. Researchers designed an Internet and paper survey (1,025 analyzed of which 975 were electronic) for use at a medium sized university in New Hampshire to collect demographic data, prescribed and non-prescribed stimulant use, and diagnosis of attention disorders. Their obtained results showed that 16% of students abused or misused stimulation medication and 96% of students who specified medication abuse used Ritalin. White et al. reported that students' supplied the following reasons for abusing and misusing medications: improving attention, partying, reducing hyperactivity, and improving grades. As identified above, college students' behaviors are highly interrelated to their college environment and personal motivations.

Adoption of Healthy Weight Behaviors

Although health promoting information continues to increase and the implications for this research repeatedly reveal positive outcomes for populations of all ages, the adoption of healthy behaviors is not consistently seen across all populations (Nahas et al. 2003). Therefore, it is important to understand the determinants, predictors, and barriers, of healthy weight behaviors. What factors promote or deter the adoption of healthy weight behaviors?

Nutritional Determinants, Predictors, and Barriers

Determinants of nutritional intake are labeled under a variety of subject headings: food predictors, food preferences, food motivations, food determinants, or food influences (Allen, Cumming & Woodard, 1998; Chung & Hoeer, 2005; Hargreaves, Schlundt, & Buchowski, 2002; Kandiah, Yake, Jones, & Meyer; Marquis, 2005; Unusan,

2006). Possible influences or determinants of nutritional intake have included personal, cultural, and environmental factors.

Chung and Hoerr (2005) explored factors that influence fruit and vegetable intake among college students. The researchers recruited participants from a nutrition class at a large, north central university in the United States. A total of 360 students completed the questionnaires, all participants were between the ages of 18 and 24, and 65% of participants were women.

Participants in the study completed three instruments (Chung & Hoerr, 2005). The demographics and health habits survey assessed gender, residence, etc., but also collected information about students smoking, physical activity, and drinking habits. The self-created psychosocial factors survey measured students' attempts to change nutritional behaviors and self-efficacy in completing those changes. Lastly, students completed 3-day food records that were used to analyze average servings of food groups and discretionary fats.

The researchers found that approximately 44.5% of women consumed 3 servings of vegetables per day (Chung & Hoerr, 2005). Furthermore, the Chung and Hoerr analysis showed that several factors were significantly correlated with fruit and vegetable intake in women: residency ($r = 0.22$, $p < 0.001$), smoking ($r = -0.19$, $p < 0.01$), alcohol consumption ($r = -0.17$, $p < 0.01$), regular physical exercise ($r = 0.25$, $p < 0.001$), past successful attempts to increase consumption of fruits and vegetables ($r = 0.32$, $p < 0.001$), frequency of eating breakfast ($r = 0.31$, $p < 0.001$), self-efficacy ($r = 0.33$, $p < 0.001$), energy intake ($r = 0.34$, $p < 0.001$), and consumption of bread ($r = 0.23$, $p < 0.01$). Thus,

for this group of women the most important influences on fruit and vegetable intake were past attempts to increase intake, energy intake, and frequency of eating breakfast.

Hargreaves et al. (2002) also studied factors that influence eating behaviors. The researchers recruited 40 African American women from Tennessee universities to participate in focus groups to explore factors that influence their eating choices. The questions posed at the five focus groups (eight participants in each group) were grouped into four areas: meal pattern, food preparation, eating out, and food, family, and community.

Hargreaves et al. (2002) identified 10 categories based on participants' responses that related to their food choices: (1) food preferences, (2) specific meals, (3) food preparation, (4) health awareness, (5) shopping and purchasing foods, (6) snacking, (7) planning, (8) eating out, (9) emotions, and (10) family and social. Convenience and time were the most frequently mentioned influences. Also, the authors found that taste, habits, health, cost, social occasions, emotions, were also motivating factors. For most of the participants, healthy choices were seen as difficult decisions and actions to take.

Unusan (2006) explored barriers that influence fruit and vegetable intake among college students, and found that the most common barriers were to a higher consumption rate of fruits and vegetables were stress, fatalistic mindset, convenience. For example, Kandiah et al. (2006) found that during unstressed times, 80% of college students reported eating healthy, but during stressful times, only 33% reported continuing the healthy patterns. Hargreaves et al. (2002) also reported that traditions, habits, and price can be a barrier to making healthier choices for some women.

Physical Activity Determinants, Influences, and Barriers

Sallis and Owen (1999) reported that the major determinants of physical activity were grouped into the following theoretical categories:

- Demographic and biological
- Psychological, cognitive, and emotional
- Behavioral attributes and skills
- Social and cultural
- Physical environment
- Physical activity characteristics

Nahas et al. (2003) reviewed literature focusing on physical activity behaviors and maintenance in high school and college populations in order to identify barriers and influences. In their research perceived barriers for this population consisted of three predominant categories: personal (i.e. depression), situational (i.e. workload), and physical (i.e. lack of facilities). Furthermore, several perceived barriers such as lack of time, lack of money, lack of facilities, lack of a partner, dislike of exercise, worries, and competing demands were identified by the authors (Nahas et al., 2003).

Correspondingly, Brown (2005) applied the Exercise Benefits/Barriers Scale and Seven-Day Physical Activity Recall (PAR) to 398 undergraduate students (93.5% Caucasian, 57% female, 69.6% freshman, and 98.2% never married) from a Midwestern state university, and measured perceived benefits, barriers, self-efficacy, and physical activity level. The Exercise Benefits/Barriers Scale (EBBS) examines seven factors: physical performance, feel better, task improvement, fatigue, pleasurable activity, facility

obstacles, and preventative health (fatigue and facility obstacles were the barriers, while the other four factors were all benefits). The results from the EBBS showed that “greater endorsement of perceived benefits was associated with higher levels of physical activity” (Brown, 2005, p.113). Of the seven factors, differences between men and women only emerged for fatigue and pleasurable activity (men reporting higher degrees of both factors than women). The authors suggested these responses may be due to greater pleasure of activities superseding the feelings of exertion for men. Secondly, PAR results for the sample of students was very high, with 81.5% of the sample meeting the U.S. recommendations for daily activity. This number may have been inflated because recall was utilized or the sample may have included an above average group. Lastly, the EBBS may present insufficient data because it only measures two barriers. Therefore, these results are limited in explaining the perceived barriers of the college population.

On the other hand, Gyurcsik et al. (2004) studied barriers to vigorous physical activity (VPA), coping self-efficacy (CSE), and task self-efficacy (TSE) among 132 students transitioning from high school to college (between 17 and 19 years old, 70% female, 85.6% white, non-Hispanic, and 96.2% single). Gyurcsik et al. used seven categories for classifying barriers: intrapersonal, interpersonal, institutional, community, public policy, physical environment or unclassifiable. Secondly, multi-item Likert scales were used to measure CSE and TSE, and VPA was measured with a modified version of Godin’s Leisure Time Activity Questionnaire. Their ecological study found that 47% of the students failed to exercise vigorously at least 20 minutes 3 days of the week. The most abundant barriers to vigorous physical activity listed by students were institutional

(33%), followed by intrapersonal (26%), interpersonal (25%), physical environment (11%), community (5%), and public policy (0%). Complementary to these results, was the fact that students reported moderate confidence in their abilities to cope with barriers to physical activity, but also reported higher confidence in their ability to perform regular vigorous activity. Furthermore, regression analysis revealed that coping self-efficacy was a significant predictor of task self-efficacy ($F(1, 110) = 17.38, p < 0.01$) and task self-efficacy significantly predicted vigorous physical activity ($F(1, 110) = 20.19, p < 0.01$). This study suggests that students who are bombarded with numerous barriers to physical activity are more confident in their ability to perform adequate physical activity, but limited in their coping self-efficacy beliefs and skills

Intervention Strategies

Interventions related to weight behaviors include weight loss programs aimed at improving nutritional intake and physical activity level, and programs aimed at decreasing the prevalence and incidence of dysfunctional eating. However, many of these strategies have proven to be quite ineffective in past years (Marshall, 1996). Moreover, several authors have found that these programs may do more harm than good (Garner and Wooley, 1991; Marshall, 1996; O'Dea, 2005). This portion of the review will include a synopsis of current interventions.

Unhealthy Eating

Most programs aimed at curbing unhealthy eating are also weight loss programs. One of the most common approaches at the individual level is restricted eating (Miller, 1999). Miller reported restricted dieting was typically unsuccessful because most people

were unable to sustain the behaviors. Restricted dieting is associated with many negative outcomes such as weight recycling, altered body composition, heightened fat storage potential, decreased resting metabolism, dysfunctional relationships with food, increased risk of eating disorders, and low self esteem (Miller). Also, Marshal (1996) reported that weight-loss diets increased the incidence of eating disorders, and also resulted in numerous unhealthy psychological and physical consequences (p.171).

In light of the above assertions, many researchers in the mid-1980s shifted toward a philosophy that healthy weight maintenance was possible with unrestrained eating (Schwartz, 1996). This philosophy became known as unrestrained eating (Hawks, Madanat, Hawks, & Harris, 2005). “The concept of intuitive eating suggests that all individuals have within themselves a natural mechanism that is allowed to function will ensure good nutrition” (Hawks et al., 2005, p.332). Hawks et al. also reported that within the philosophy of intuitive eating, there are six key attributes that lead to a healthy weight and positive health indicators:

1. The ability to clearly recognize the physical signs of hunger, satisfaction, and fullness
2. The ability to sense the nutritional needs of the body
3. The ability to consider the full range of food possibilities and weigh these choices
4. The ability to carefully monitor food consumption in terms of satisfaction
5. The ability to value the health energy of the body more

than attractive appearance

6. Rejection of restrictive dieting as a means of weight control, and the building of a healthy food relationship that builds self-esteem

In order to test the legitimacy of intuitive eating Hawks et al. (2005) evaluated the relationship between intuitive eating and health indicators among college women (original sample= 205 females, but study used 15 high and 17 low Intuitive Eating Scale (IES) for comparison). The sample used in the study ranged from 18 to 22 years old. The researchers used the IES, which was previously tested for validity and reliability within the female college population, to measure the four subscales of intuitive eating: intrinsic eating, extrinsic eating, anti-dieting, and self-care (high scores indicate adherence to intuitive eating principles). The researchers also took a 12-hour fasting blood sample, measured BMI, measured percent body fat (Bod Pod), and estimated VO₂ uptake with the submaximal treadmill-jogging test to evaluate health indicators.

The results from the Hawks et al. (2005) study revealed significant differences in health indicators for the group with high IES scores. The high IES group scored significantly lower on the following health indicators: BMI ($p < 0.01$), high-density lipoproteins level, triglycerides, cardiovascular risk, and total iron binding capacity (for all four indicators $p < 0.05$). This study does suggest that intuitive eating may have many beneficial results. However, more research with larger study sample sizes is needed to further understand the impact of the intuitive philosophy.

Physical Activity Levels

Among women, interventions concerning physical activity have lifestyle or psychosocial approaches (Musgrave, Allen, & Allen, 2002; Segar, Jayaratne, Hanlon, & Richardson, 2002; Young & Stewart, 2006). Since the current study explores psychosocial constructs of healthy weight behaviors among college women, two dimensions of physical activity interventions will be explored: gender and ethnicity (culture). Each of the various types of interventions and their respective documented effectiveness is explored.

Segar et al. (2002) evaluated a tailored physical fitness intervention targeting the many barriers that women may face known as “Fitting in Fitness for Life” (FIF) (p.339). Segar et al. (2002) reported that the FIF program is based on four theoretical models: Social Cognitive Theory, Empowerment Theory, Objectification Theory, and the Self-in-Relation Theory. The program format entailed a 6-week program that met weekly for 2 hours, and consisted of small groups (8 to 12 women) and a facilitator. The program used group “consciousness-raising activities, group discussions, written exercises, planning, and weekly evaluation reports” to enhance self-management and self-efficacy skills (Segar et al., 2002, p.340). Additionally, attendees are expected to exercise outside of sessions in order to determine barriers and then develop strategies to counter those barriers.

Segar et al. (2002) collected pre- and post- data among 80 participants for the following variables: attitudes about exercise, approaches to being physically fit, and strategies for being physically fit using. Pre- and post- data showed positive increases in

positive attitudes (29%) and positive approaches (54%); both of these increases were significant results ($p < 0.01$). Thus, framing an intervention that gave women the skills to overcome their personal barriers proved to be successful.

Young & Stewart (2006) proposed a different yet similar approach to help increase the prevalence of regular physical activity among women. Musgrave et al. (2002) reported, "The relationship between spirituality and health provides an important perspective for public health interventions" (p.557). With this affirmation in mind, Young and Stewart (2006) created and evaluated a church-based physical activity intervention for African-American women. The researchers were able to recruit 11 churches within the Baltimore, Maryland area to participate.

Researchers designed the study using Social Cognitive Theory constructs (Young & Stewart, 2006). The researchers created two types of intervention for comparison among the African American: An aerobic exercise and stretch and health groups. The aerobic group met 1-hour weekly for six months. The distinction between this aerobic group, and others of the like, was the use of prayer among and between the women, which was emphasized to foster social support (Young & Stewart, 2006). The stretching and lecture group also met weekly with alternating weekly tasks (low intensity stretching and lecturing). This group did not involve prayer and social support activities. "At the end of the 6-month classes, 1-month of aerobic exercise classes were provided" (Young & Stewart, 2006). After the 6-month intervention, comparisons were made and analyzed among the groups. No significant differences of energy expenditure between the two groups were reported after the intervention. However, psychosocial differences were

evident among both groups. For example, self-efficacy scores increased significantly ($p < 0.008$) and social support from family ($p < 0.005$) and friends ($p < 0.02$) also significantly increased. Also, physical inactivity decreased from 26% to 18%. Thus, this church-based intervention helped women become more active, increased self-efficacy and social support, but did not show significant physiological results.

Each of these interventions had different approaches, but both showed promising results. Interventions aimed at college women will have to take into account cultural and environmental factors. However, the presented interventions affirm that effective interventions must be tailored for the target population.

Health Information Delivery among the College Population

Another important dimension to healthy-weight behaviors is information delivery. This section will first explore the different sources that college students use to obtain health information. Siebert, Wilke, Delva, Smith, and Howell (2003) reported that college students get their health information from the following sources: friends, parents, medical staff, the Internet, magazines, leaflets, pamphlets, flyers, and television. The most abundantly utilized source was the student's friends (60%) followed by the Internet (57%) (Siebert et al.). Escoffery et al. (2005) also reported that 74% of college students sampled from two southeastern universities reported using the Internet for health information.

Consequently, between 57-74% of college students used the Internet to obtain health information. However, Siebert et al. (2003) imply that peers may be the greatest source of health information. The challenge then for health professionals is to ensure that

students have access to credible information on the Internet and through on campus sources because students may access the most credible sources, the least.

Qualitative Methods

“Qualitative research emphasizes the measurement and analysis of casual relationships between variables, not processes” (Ellett & Beausang, 2001, p.10). Accordingly, qualitative research emphasizes explaining and decoding a story or presenting a picture of relationships. This section will provide a summary of the most common forms of qualitative studies, discuss the reliability and validity of qualitative methodology, summarize the advantages and disadvantages of qualitative inquiry, and provide a detailed overview of the inquiry method used in the present study—focus groups.

Types of Qualitative Studies

Qualitative research utilizes a variety of methods of inquiry to carry out study purposes. For examples, qualitative processes include case studies, interviews, focus groups, nominal group processes, artifacts, personal experiences, introspection, cultural texts and productions, observations, historical data, and visual texts (Denzin & Lincoln, 2000). These various forms of inquiry, however, may be grouped under five types of qualitative studies: ethnography, critical social theory, content analysis, narrative analysis, and phenomenology based on the researchers chosen purpose (Ellett & Beausang, 2001).

Ethnography

Ethnographies provide rich, detailed descriptions of human lives. Ethnography “combines research design, fieldwork, and various methods of inquiry to produce historically, politically, and personally, situated accounts, descriptions, interpretations, and representations” to provide a detailed image of a sociological event or community (Tedlock, 2000, pp.455-456). Ethnographers develop these lush descriptions by typically submerging themselves in the identified culture or community (Tedlock). This submersion allows the researcher to explain beliefs, motivations, or behaviors that may not be as visible through other study methods.

Critical Social Theory

Critical Social Theory emphasizes the study of oppressed groups, and aims to represent their life experiences in order to raise consciousness, political action, and activism (Ellett & Beausang, 2001). This type of study includes examining groups such as minorities and women (Ellett & Beausang, 2001). Critical Social Theory was developed approximately 80 years ago in Germany by a group of writers influenced by the devastations present during World War I (Kincheloe & McLaren, 2000).

Content Analysis

The purpose of content analysis is to describe the contents of data (Ellett & Beausang, 2001). This data may be in the written or visual form, including speeches, books, film, or photography. Furthermore, content analysis may also involve frequency characteristics, such as noting the number of times people use the same language to describe an event (Ellett & Beausang). As many of the other studies described, content

analysis may be used in conjunction with other methods, such as quantitative inquiries or other qualitative studies. Overall, content analysis thoroughly evaluates the depiction of some form of written or visual data.

Narrative Analysis

A narrative analysis is similar to a content analysis, except the narrative analysis is applied to a story or meaningful account of events over time, instead of written or visual data (Ellett & Beausang, 2001). Thus, the researcher will analyze the form of the narrative, history of the experience, and the relationship of events in the story (Ellett & Beausang). Narrative analyses may not be as common as the other methods, due to biases of the narrator, but can provide a beneficial analysis when aligned with the appropriate purposes (Ellett & Beausang).

Phenomenology

Phenomenology involves the description of an event based on the depictions of the individuals involved (Ellett & Beausang, 2001). The findings are continuously identified throughout the study, and thus shape the procedures, methods, and analysis that are employed. One important type of phenomenological methodology is Grounded Theory, which utilizes open-ended, observational data to develop or verify a theory (Ellett & Beausang).

Reliability and Validity

Reliability denotes three key words: consistency, dependability, and stability (McDermott & Sarvela, 1999). In other words, instruments must provide results that are free from as much error as possible. More scientifically, “reliability is the degree to

which test scores are free from errors of measurement, or it is the degree to which repeated observations of the same characteristic yield the same results” (McDermott & Sarvela, 1999, p.132). Reliability studies provide evidence that an instrument will assess the defined variables within the defined population accurately each time.

Validity affirms the quality of the collected data for the specific variables measured within a certain population. “A valid instrument is one that measures what it is suppose to measure” (McDermott & Sarvela, 1999, p.132). Reliability and validity studies allow researchers to verify the quality of their data. Even though, qualitative and quantitative studies use distinctively different methods, the researcher still must demand that the results presented are verifiable and reliable.

Although qualitative data may not utilize the robust techniques presented in quantitative studies, reliability and validity are components of qualitative studies. Morse, Barrett, Mayan, Olson, and Spiers (2002) argue that there are two methods that qualitative researchers may utilize to enhance the reliability and validity of research studies: (1) weave verification mechanisms into every step of inquiry and (2) ensure investigator responsiveness. Verification strategies include ensuring that the methodology and research questions are appropriately structured, that the sample is appropriate for the study, and that the collection and analysis of data occur concurrently (Morse et al.). Collecting and analyzing data is an important reliability and validity process in qualitative research because this vital verification step, ensures that the researcher is allowing the data to guide the process—an invaluable step in qualitative studies.

Due to the nature of qualitative research, the approaches used to verify validity and reliability are quite different from quantitative data because the research purposes and processes also differ. Nonetheless, qualitative research must still provide evidence that the results are valid and reliable by utilizing several verification steps, which should be woven into the research process. Furthermore, steps such as analyzing face validity must also be used to ensure the quality of created or chosen instruments.

Advantages and Disadvantages

There are many important characteristics to consider when developing a research project. Qualitative and quantitative research has distinct characteristics. It is not necessarily whether these characteristics are advantages or disadvantages, but whether these characteristics adequately fit the purpose of the research project. For example, prevalence studies of diseases or conditions demand that a statistic is presented at the conclusion of the study with an estimate of how many people have the condition. This purpose fits a quantitative study, which would be appropriate to gain information on occurrence. However, a researcher that may want to understand the lifestyle of people afflicted by a condition or disease may choose a qualitative study to allow the richness of the individuals experience to be revealed. Thus, quantitative and qualitative studies are more about purpose than advantages or disadvantages.

Nonetheless, a researcher intent on designing a qualitative study must be knowledgeable of several factors. One of the most important, is understanding that a qualitative study may take several shapes and forms throughout the process. Meaning, the project may change as data is collected, and the timeline of the project may be

adjusted (Krueger & Casey, 2000). Furthermore, a qualitative study requires in-depth attention to small details that may have monumental effects on the research process or outcomes (Denzin & Lincoln, 2000). Qualitative research involves different processes than quantitative and researchers must understand these differences and be prepared to deal with varying challenges as they arise.

Overview of the Focus Group

A focus group is a type of procedure and method used to collect qualitative data. A focus group is a planned, designed series of discussions of six to eight people in each group who share common characteristics (Krueger & Casey, 2000). The intent of these discussions is to promote self-disclosure among participants (Krueger & Casey).

Focus groups are used to serve a variety of purposes such as decision making, product or program development, customer satisfaction, planning and goal setting, needs assessment, and policy making and testing (Krueger and Casey, 2000). As in all research designs, the purpose of a study guides the methodology, and in focus groups, the purpose of the study guides the implementation and design of the focus group methodology. According to Krueger and Casey, the overall process of developing a focus group design is as follows: establishing the purpose of the study, developing a questioning guide, selecting participants, training the moderator to facilitate the discussions, analyzing data, and reporting results.

Summary

A plethora of factors impact female university students daily. Moreover, many of these factors play a major role in weight maintenance, weight loss, or weight gain for

women. In order for future interventions of healthy-weight behaviors to be successful, health professional must take into account the variations that exist among ethnicities and cultures. Exploring and understanding the factors that predict weight gain in women will help ensure that health interventions across the country are tailored for the characteristics of the targeted populations.

CHAPTER III

METHODOLOGY

This study used secondary data collected in fall of 2005. A phenomenological approach was used to analyze barriers, influences, locus of control, family influences, campus culture influences, and sources of health information, concerning healthy weight behaviors among college women 18 and 44 years of age (Love & Rich, 2005). The initial project was conducted in two phases (A. Love, personal communication, August 27, 2006). Quantitative data and measurements collected in Phase I of the Psychosocial Barriers to Healthy Behaviors in College Students Project (with the exception of the demographics survey) was not utilized for the purpose of this study. This study utilized the Demographics and Satisfaction Survey (DSQ) (Appendix A), which was completed in Phase I and the Focus group data which were collected in Phase II. The procedures followed for this study are presented in this chapter under the following headings: a) Population and Sampling, b) Protection of Human Participants, c) Data Collection Procedures, d) Data Analysis, and e) Summary.

Population and Sampling

The Psychosocial Barriers to Healthy Behaviors in College Students (PBHB) project relied on a convenience sample of college students from a public, southwestern university (Love & Rich, 2005). This sample included females of 18-44 years of age. Students received an announcement about the project through an introductory psychology

course and via Blackboard. They emailed the researcher to schedule and verify an appointment.

Protection of Human Participants

The study was submitted to the Texas Womans University Institutional Review Board and approved for completion (see Appendix A). Furthermore, the study design did not use any form of Internet or electronic communication to transfer data, and no data was identifiable. Lastly, documents remained locked and secured in the office of the principle investigator.

Data Collection Procedures

All focus groups were videotaped and audiotaped (A. Love, personal communication, August 27, 2006). Three researchers were present in the room during all focus groups. One researcher was the facilitator, a second research assistant took notes for the entire group on butcher paper, while the third assistant took individual notes on the discussion and environment, such as students' body language (A. Love, personal communication, August 27, 2006). A total of 17 focus groups were conducted.

The focus groups were semi-formal with a list of 11 questions, and additional probing questions (A. Love, personal communication, August 27, 2006). Each group lasted approximately an hour (A. Love, personal communication, August 27, 2006). The focus groups were structured to obtain data barriers, influences, locus of control, family influences, and sources of health information pertaining to healthy weight behaviors.

Each focus group was asked either all odd or even questions (Appendix B) in order to obtain thorough, in-depth responses to each question (A. Love, personal

communication, August 27, 2006). In other words, each group only answered 5 or 6 questions of the 11 questions that were developed. Of the 17 focus groups, 3 were eliminated because of insufficient data, 7 groups answered all even numbered questions, and 7 groups answered all odd numbered questions (A. Love, personal communication, August 27, 2006).

Instrumentation

The following instruments were used in the PBHB 2005 Project:

1. Demographics and Satisfaction Questionnaire (DSQ) is a self report measure composed of close ended questions. This questionnaire provided necessary characteristics about the sample of women such as ethnicity and age (Appendix B).
2. Focus Group Guide consisted of a set of 11 questions with probing questions, constructed to identify, barriers and influences of healthy weight behaviors, level of control of healthy weight behaviors, family influence on students' current healthy weight behaviors, campus culture, and sources of health information. These questions were constructed by the researchers to overlap with many of the questions posed in the DSQ in order to gain deeper insight on students' quantitative responses (Appendix C).

Data Analysis

Focus group data were transcribed from audio recordings, audited using video recordings, and coded. A total of 17 focus group transcripts were obtained from Love and Rich (2005). These 17 focus groups will be analyzed until saturation is reached.

Each focus group will be analyzed for themes using the long table method until saturation is reached (Krueger & Casey, 2000). This method consists of grouping coded data for each focus group so that all codes are together and visible. The following procedure was utilized to ensure the accuracy of findings.

Focus group data were coded based on the subject of the comment (some data contained two or more codes). Each code was physically cut with scissors and spread out and along a table and grouped according to its code. Some coded comments fit more than one group and were noted in multiple categories. Also, some codes were left ungrouped because they did not fit a particular group. Next, assertions derived from grouped and ungrouped codes were written down. After all focus groups were dissected in this manner, assertions were color-coded according to the research question addressed. Finally, these color-coded groups were used to synthesize the resulting themes, and verified by reviewing the original focus group transcript.

Summary

The procedures outlined above were designed to carry out the study purpose. Within these parameters, the study also aims to protect all participants and report reliable and valid data in order to contribute to the available body of knowledge concerning the adoption of healthy weight behaviors. As a result, the previous methodology is presented to ensure the accuracy of the findings.

CHAPTER IV

RESULTS

The purpose of this study was to analyze barriers, sociocultural influences, locus of control, and sources of health information concerning healthy weight behaviors among college women 18 and 44 years of age. A total of 17 focus group transcripts were obtained from Love and Rich (2005). The transcripts documented the hour-long focus group discussions in detail, excluding minor problems in audio translation where participants' dialogue was incoherent. Focus group transcripts were labeled 1-17 according to the order of completion. The first three focus group transcripts were not included in the analysis as advised by Love and Rich (2005) due to problems within the initial sessions, such as limited attendance and protocol changes. Among the 17 focus group transcripts, saturation in data analysis was reached at focus group 12. Thus, this section will report on data analyzed from focus groups 4-12. Furthermore, this discussion will report descriptive statistics, describe the results of the long table analysis method of focus group transcripts, and conclude with a summary.

Descriptive Statistics

Descriptive statistics were computed using the Statistical Package for the Social Sciences (SPSS) version 14.0 for Windows. Among the 17 focus groups, transcripts from groups 4-12 were utilized. This sample included 50 participants. Descriptive data were analyzed for these participants, except for one participant who did not complete the

demographic survey. A complete summary of demographic data is provided in Table 1. Participant characteristics were the following: 69.4% of participants were 18 or 19 years of age, 95.8% were single, 75% were African Americans or European Americans, 58.7% were freshmen, 757% classified themselves as middle and upper socioeconomic status, 95.9% did not have children, and 95.8% were never diagnosed with an eating disorder.

Focus Group Themes

Focus group data were coded based on the subject of the comment (some data contained two or more codes). Each code was physically cut with scissors and spread out along a table and grouped according to its code. Some coded comments fit more than one group and were noted in multiple categories. Also, some codes were left ungrouped because they did not fit a particular group. Next, assertions derived from grouped and ungrouped codes were written down. Finally, these color-coded assertions were used to synthesize the resulting themes, and then verified by reviewing the original focus group transcript.

Overarching Themes

The results of each individual research question will be reported. However, throughout the analysis process, several overarching themes emerged about factors influencing the health of college students. Five overarching themes were found and are presented in Table 2.

Table 1

Frequencies and Percentages of Focus Group Participants				
Characteristic	Group		N	Percentage
Age	18-19		34	69.4
	20-21		9	18.4
	22-23		3	6.1
	26-44		3	6.1
	Total		49	100
Marital Status	Single		46	95.8
	Married	2	4.2	
	Total		48	100
Ethnicity	African American		18	37.5
	Asian American	3	6.25	
	European American		18	37.5
	Latin American	3	6.25	
	Other		6	12.5
	Total		48	100
Classification	Freshman		27	58.7
	Sophomore		13	28.3
	Junior		6	13
	Total		46	100
Socioeconomic Status	Lower		3	6.8
	Lower Middle		8	18.2
	Middle		21	47.7
	Upper Middle		12	27.3
	Total		44	100
Students with Children	Do not have children		47	95.9
	Have children*	2	4.1	
	Total		49	100
Eating Disorder (ED)	Not Diagnosed	46	95.8	
	Diagnosed**	2	4.2	
	Total		48	100

*Of the two participants with children: one had one child and the other had two

**Of the two participants diagnosed with EDs: one had bulimia and the other anorexia

Table 2

Focus Group Overarching Themes
Balance is a key feature of a healthy status
Participants perceive <i>no choice</i> among weight-related decisions
The college campus promotes unhealthy weight behaviors
Self and others' perceptions influence locus of control
Peers positively and negatively influence weight-related behaviors

A ubiquitous theme throughout most focus groups transcripts was that *balance was a key feature of a healthy status*. This notion of balance was documented in eating, exercising, personal experiences, and social life. The participants noted struggles and strategies for balancing meals, work, exercise, school, family, and other areas of their life.

... If I do eat something like a burger or a piece of pizza,
I'll always have some kind of salad or fruit or something...
(Participant 142)

Well I put limitations... I don't try to do everything. ... I
look at the whole picture and try not to overload my
calendar. (Participant 1)

Well, you have an available kitchen [in the dormitories] but it's like one kitchen and it [may not be available]. So you just say well, I can just go buy something and heat it up instead of making a well-balanced meal. And you're doing that maybe four to five times out of the week (Participant 11)

Another omnipresent theme was the *perception of no choice*. Many participants spoke of situations that they faced on campus or outside the campus environment that prevented them from making healthier choices.

When you get off at a certain time [from work]...all around you is Jack in the Box, McDonalds, Whataburger...it really stinks because regardless of what you get there it's not going to be healthy for you. (Participant 104)

You have to look at your options, because I don't have a car. I'm here from Seattle, Washington...so I can't just get in my car and leave and go eat somewhere healthier, you know? (Participant 88)

The next pervasive theme throughout the focus group transcripts was the *perception of the college campus as a promoter of unhealthy weight behaviors*. Although participants noted the improvements in student dining and the benefits of the fitness

center, many factors, such as vending machines, C-Store products, and the Underground offerings were promoters of many unhealthy weight behaviors according to participants. The C-Store is a “retail operation that sells convenient foods, beverages and health and beauty items... the C-Store also houses a Bene' Pizzeria with a late night menu and offers “Grab & Go” sandwiches and salads.” (TWU, 2005a). The C-Store is located within the dormitory environment for students' convenience. The Underground is an all-you-can-eat cafeteria-style dining facility (TWU, 2005b). With regard to healthy food on campus, participants appear to become “burned out” on repetitive menus and want more variety.

[While] living on campus it's real hard to actually stay healthy. [Staying healthy on campus is hard] because there's a lot of junk food everywhere, like I know in the Stark Commons you see vending machines... so it makes you want to buy something that's not really healthy.

(Participant 66)

I still eat healthy because I'm such a health freak, but, it's just kind of low on variety--like I eat a turkey sandwich every time. And so sometimes they have different sides, like they'll have beans or something, but I don't ever eat the main things so I eat a turkey sandwich at least once a day, like every day since I've been here. But it's ok; it's just a lot different. (Participant 70)

But even when you do live on campus and you do eat in the

“Underground”, it’s the same stuff... (Participant 71)

The previous theme involving campus culture is an external, environmental factor. However, many participants reported an interesting internal factor—*self and others perceptions influence locus of control*. Thus, a persistent theme among focus groups was also the power of images. Participants’ repeatedly spoke about media’s influence on self-image, others’ perceptions and influences on their behaviors, as well as overall self-esteem and self-image effects on their weight behaviors. Most of the comments presented by participants were concerning control. Therefore, participant comments concerning self-esteem and images are presented in the Perceptions of Locus of Control section.

Lastly, a theme that occurred in all focus groups was that *peers positively and negatively influence weight-related behaviors*. Many participants either benefited from an encouraging friend or expressed feeling helpless to counter the negative influences of friends.

I think friends are a factor because when I don’t
want to go work out, if my friends go, then I kind of
feel like I have to. (Participant 109)

I’ve got a couple of friends here and we started
doing that [cooking together] a couple of weeks

ago...so we'll go out and we'll buy pasta and a salad and breadsticks so we can cook that— something easy that can be done in the stove or oven down in Guinn or Stark, and we can easily do that and not have to deal with the Underground or the choices that we have here. (Participant 126)

You don't want to go to a party with your friends and you think maybe you should go and you don't want to disappoint them. (Participant 162)

Research Question Results

The overarching themes were presented in many of the focus groups, and were reported because of their repetition in the transcripts. Their relevance in accordance with the research question findings will be explored in the proceeding chapter. Next, the results of each research question are presented.

Barriers Impeding the Adoption of Healthy Weight Behaviors. Participant responses to barriers that prevent healthy weight behaviors are presented below

1. What barriers prevent the adoption of healthy weight behaviors among college students?

Several barriers were listed by participants concerning healthy weight behaviors. These barriers can be grouped into internal (self-controlled) and external (environmental). The majority of the reported barriers were factors that participants could control or change. Internal barriers relating to healthy weight behaviors cited by focus

group participants included: lack of rest, failing to adequately evaluate behavior consequences, motivation, stress, self-image, cravings, making unrealistic goals, feelings of inadequacy compared to other gym participants, mood, lack of perseverance to obtain long-term results, and willpower. Secondly, external barriers included: overloaded school and work schedules, alcohol and drug consumption, living on campus, peers, money, having children, intimate relationships, organizational involvement, weather concerning participation at local fitness centers, access and convenience of healthy or unhealthy foods, lack of quality among healthy foods on campus, and family eating habits acquired as a child.

Examples of barriers reported are provided below:

You're limited to what you can eat [on campus]. It's harder to like cook for yourself and make a healthier meal. You're kind of limited to like what's in the Underground or Chik-Fil-A. (Participant 151)

My parents divorced when I was three. I was raised by my mom who worked all the time and I was in activities but it was real hard...and then when I got into high school I had to quit because I had to take care of my younger brother and sister...and so like I basically had to grow up so fast. And like now I'm working all the time and by the time I get

off work at eleven or twelve o'clock at night I just want to go to bed because I have a nine o'clock class the next day.
(Participant 123)

...when my roommate and I first came to school we worked out every day that we were here [at least] four days out of the week. And then first exams came around and that all stopped because I mean usually before the first exam your course load is pretty easy. There are no assignments. There are no really papers. You're just basically reading and studying and trying to keep up with the classes. Well then after the first exam it starts to get harder and it just keeps getting harder until finals are over. And, it's just really hard to find time now to exercise.
(Participant 71)

Sociocultural Influences Supporting the Adoption of Healthy Weight Behaviors.

Participant responses to influences that support the adoption of healthy weight behaviors are presented below:

2. What sociocultural influences (such as environment, peers, and culture) support the adoption of healthy weight behaviors among college students?

Transcript data analysis also revealed students perceptions of sociocultural

supporting factors supporting the adoption of healthy behaviors. These factors were supportive relationships and peers (particularly exercise partners or buddies), energy requirements for participants who are currently athletes, availability of healthy food of good quality, and good habits perpetuated by family upbringing. The most mentioned form of support was also one of the main sources of barriers—peers. Participants' perceptions of these factors are reported below:

You know, if you're used to eating healthy food, you probably will. (Participant 164)

Yeah, I think that depending on what sport you're involved in...you may have the tendency to eat something that's a little more substantial ... [You choose to] eat more and probably eat a little bit better. (Participant 104)

I guess now that I have access to it [the gym] and it's free.

I'm going to take advantage of it. (Participant 167)

Students Perceptions of Locus of Control. Participants' perceptions of locus of control are presented below:

3. What are college students' perceptions of their locus of control in relation to healthy and unhealthy weight behaviors?

Participants mentioned several entities that affected the control of weight behaviors. As in the barrier data, factors were both internal and external. Also, the

prevalence of factors having both a negative and positive influence was reported.

Overall, participants stated that they do have control over many things that affect their health, indicating self-responsibility for health, but varying levels of control were reported. Likewise, participants also listed many factors that limit their control. The following internal factors affected perceptions of control concerning healthy weight behaviors: emotions, self-esteem, others' perception of the participant, and metabolism. External factors affecting control were, busy schedules, lack of transportation, and a lack of structure (such as that experienced while in high school sports or a family presence).

It depends on how you look at yourself [because] you have control over the choices that you make, but might not necessarily have control on how you feel about each choice. I grew up in a town where you had to be a certain image to be accepted, so I may be fine with the choices I make but I may not feel 100 percent society wise about the choices that I make. (Participant 58)

I think everybody has a lot of control and I do agree that now when you're in college it seems to be or at least on this campus, health and smart decisions, seemed to be stressed even more. But I think it's like if control is healthy decisions, you just have to make the effort...to exercise you

know. You have choices and you just have to make the conscious decision and it may not be the easiest one or but, you have that choice. I think you have a lot of control and maybe even more so now that you're in college to shape yourself, you know, you have control on what you eat, what you put in you, how you exercise and what your priorities are [because] you don't have a family there to dictate what's going to be on the dinner table...your control increases. (Participant 104)

I do have control. I have control on going to work out because it's open long hours. But when it comes to the food, I'm not trying to be hungry. And I think the healthy little, little, little carrots [is] only going to satisfy me for about 30 minutes. So I could choose that stuff, but at the same time I ain't trying to be hungry. (Participant 88)

I think also willpower to want to eat healthy or to want to work out [affects control], it's all about you. No one can decide it for you. (Participant 134)

I don't think I do [have control] just because there's so many factors ...in general that affect me that I don't have control over [such as] my environment or what I stress out about or like I do have anxiety, I'm on medicine for it but it

still doesn't control all of it. There's just other factors beyond my control that I think influence me more than what I do have control over. (Participant 123)

Familial Influences on Current Weight Behaviors. Participants' perceptions of familial influences are presented below:

4. How do college students perceive familial influences on current healthy or unhealthy weight behaviors?

Like many of the previous factors listed, familial influences also had a dual negative and positive impact. Participant responses indicated that their family health behaviors were either negative or positive. More so, participants reported that they either maintained these behaviors or altered them after entering the college environment.

Well, me and my mom we're both in school so we never get a chance to cook...we're always either eating at school or eating fast food. And it's been like that ever since I can remember. She was always working—her idea of having a sit-at-home dinner was having Hamburger Helper or

something. (Participant 71)

I know in my family we tried to always have a balanced meal as opposed to [going] out to eat every single day. I've

grown up trying to have a balanced meal, [and] I try to keep that trend going, because I know how important it is for my health. (Participant 126)

I came from a family that was very athletic and I'm kind of the outcast because everybody in my family ran track, played volleyball or basketball. I decided to take dance, granted I was still getting exercise... I was like okay that's good you know; they [the university] have a dance program, so I can still be able to work out still be in a dance class. (Participant 142)

I think [family influences current health behaviors] because if you're raised in an environment where you're eating a lot of fried foods, like I know for me fried chicken and fried everything, it basically makes you crave those foods more

and versus if you're raised in like a vegetarian home then you'd be more likely to go straight to the vegetable section... (Participant 88)

Well I think that my parents always ate like vegetables and everything for dinner so we grew up with the basic food groups every night so when we go down to the Underground it doesn't have the variety of food that you like to eat. You find yourself eating stuff that is not too healthy for you, or picking out what you can. (Participant 72)

...my mom eats a lot of meat. I'm African so whenever she cooks African foods she puts a lot of meat in. I don't eat all that meat so I'm not necessarily like my mom. So, I just eat the rice and whatever else my mom cooks. (Participant 192)

I'm from India and my parents are vegetarian. My parents are more into fruits and vegetables all the time. And always all green leafy vegetables and stuff like that. So, it always kind of plays on my mind, okay that's healthy food... (Participant 157)

Campus Culture Influences on Healthy Weight Behaviors. Participants'

perceptions of the campus's influence on weight behaviors are presented below:

5. What aspects of the campus culture influence healthy and unhealthy weight behaviors among college students?

Participants were critical of the campus environment, but did acknowledge improvements on campus concerning the Underground and fitness centers. The overall pervasive opinion expressed was that several factors on campus negatively affect weight behaviors. Participants pointed out several factors that hindered their ability to make healthier choices: the dormitory kitchen setup or lack thereof (there is one kitchen per floor in each dorm), stressful and pressure-filled schedules, the absence of men on campus (reportedly lessened women's need to care about their appearance), peers, the availability of health food of good quality (some students reported cases of wilting lettuce), and the amount of unhealthy choices on campus such as the C-Store and vending machines.

Just living in a dorm in general, there's not a kitchen right there. You have to get everything ready, take it down the hall, or your refrigerator is not normal size, so you can't keep a whole bunch of extra stuff in there to make a full course meal every time you eat. I know in my refrigerator I keep a few drinks. ...I can't go out and buy meat and keep it in my fridge because there's just not room, so it's not gonna last. (Participant 58)

...in Corpus Christi like there's a beach and...it just seems happier down there. And like you come up here and you're on the college campus and everyone's so stressed out and like when finals come around, everyone's just so stressed out and so worried that it stresses you out seeing your friends stressed out, or you get a bad grade on the test and it just stresses the people out around you. Whereas if you're at home or if you're away from school you tend to be more happy and more energetic; more carefree. (Participant 123)

But I think it's a bigger issue [health habits] on a campus of men and women [compared to women only] ...the girls [on a campus of similar percentages of men and women] are more self conscious of their weight because they're trying to impress them [men] or get their attention. Here you go to school with all girls, you see... (Participant 116)

I don't know if this fits, but also if you live in a household with girls, I noticed if I buy something healthy for myself somehow it'll come up missing. (Participant 169)

...in the Underground...I hate to say it, but I've seen some brown lettuce up in the lettuce. So, I mean you know some of it's just not healthy even though it's supposed to be.
(Participant 167)

Well I know whenever I go to the C-Store all they have is pork rinds and chips and wings and pizza— all this unhealthy food. There are some fruits and salads but the lettuce is always really nasty looking, or it's not as you know pleasing to the eye as the unhealthy. (Participant 105)

Sources of Health Information among College Students. Participants' reported sources of health information are presented below:

6. What sources are college students accessing to gain knowledge about healthy weight behaviors?

Throughout most focus groups, participants reported that the information that they receive impacts their health decisions. Furthermore, participants reported that certain sources were viewed with different levels of credibility and this influenced their usage of the information. For example, individuals such as doctors and educators were viewed with more credibility than friends. "To me it depends on who it's [health information] from...I get my information from my doctor" (Participant 105). Participants also expressed that there is a tremendous amount of pressure via the media to be a certain size.

“Cause it’s just like you’re under so much pressure to be a size 2, I can’t be a size 2.”

(Participant 160)

Lastly, participants reported the various sources that they used to access health information. Participants reported that they receive health information from doctors, classes (professors), physical therapists, parents, magazines, the Internet, television, friends, campus fliers, grocery stores, participant organizations, and current research findings. Thus, participants are accessing a plethora of sources to obtain health information.

Body Dynamics

Videos for focus groups 4-12 were analyzed for body dynamics. The most abundant dynamic difference was cohesiveness. Some focus groups appeared to bond better than others. Also, changes in body dynamics were noted. Some participants rolled their eyes or made other facial changes. However, facilitators noticed many of these changes, and questioned participants about each reaction.

Summary

The overarching themes concerning health behaviors found among the focus group transcripts were participants’ perceptions of no choices among healthy and unhealthy selections, beliefs that a balanced lifestyle is a key feature of healthy status, perspectives that the college campus promotes unhealthy weight behaviors, perceptions of others’ and their self-image influences behaviors and locus of control, and the influences of peers (positive and negative) on college women attempting to live healthier lives. Thus, college women desire healthier lifestyles, but face many obstacles to

maintaining healthy weight behaviors. The following chapter will further discuss the ramifications of these results.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This study analyzed barriers, sociocultural influences, locus of control, and sources of health information concerning healthy weight behaviors among college women 18 and 44 years of age. This chapter contains the following sections: (a) Summary, (b) Conclusions, (c) Discussions and Implications, and (d) Recommendations. These sections apply and synthesize the relevance of the findings and results.

Summary

This study used archival data collected from the 2005 Psychosocial Barriers to Healthy Behaviors in College Students Project at a midsize, public university in the southwestern region of the United States and used a phenomenological approach to analyze barriers, sociocultural influences, locus of control, and sources of health information concerning healthy weight behaviors among college women 18 and 44 years of age (Love & Rich, 2005). The study was conducted using qualitative analyses. Seventeen focus group transcripts were obtained from the project's principle investigators.

Analysis occurred with transcripts 4-12 because the first three transcripts were eliminated by the initial researchers due to protocol changes and low attendance, and analysis ended at transcript 12 because saturation was reached. This sample (focus group transcripts 4-12) included 50 participants. Participant characteristics were the following:

69.4% of participants were 18 or 19 years of age, 95.8% were single, 75% were African Americans or European Americans, 58.7% were freshmen, 757% classified themselves as middle and upper socioeconomic status, 95.9% did not have children, and 95.8% were never diagnosed with an eating disorder.

Focus group analysis was structured to ensure accuracy of results. Focus group data were coded based on the subject of the comment (some data contained two or more codes). Each code was physically cut with scissors and spread out along a table and grouped according to its code. Some coded comments fit more than one group and were noted in multiple categories. Also, some codes were left ungrouped because they did not fit a particular group. Next, assertions derived from grouped and ungrouped codes were written down. Finally, these color-coded assertions were used to synthesize the resulting themes, and then verified by reviewing the original focus group transcript.

Conclusion

A total of six research questions were developed to address the study purposes. In addition to results for each question, five overarching themes related to the health behaviors of women were also found: (1) balance is a key feature of healthy status (2) participants perceive no choice among weight-related decisions, (3) participants' perceive the college campus as a promoter of unhealthy behaviors, (4) participants' and others perceptions influence locus of control, and (5) peers negatively and positively influence weight-related behaviors.

Most influences on weight behaviors were dichotomous, encompassing a positive and negative influence for participants. Detailed results are presented below:

1. What barriers prevent the adoption of healthy weight behaviors among college students?

Participants' experienced both internal and external barriers to healthy weight behaviors. Internal barriers by focus group participants included: lack of rest, failing to adequately evaluate behavior consequences motivation, stress, self-image, cravings, making unrealistic goals, feelings of inadequacy to other gym participants, mood, lack of perseverance to obtain long-term results, and willpower. Lastly, external barriers included: overloaded school and work schedules, alcohol and drug consumption, living on campus, peers, money, having children, some intimate relationships, organizational involvement, walking distance to the gym, weather concerning participation at local fitness centers, access and convenience of healthy or unhealthy foods, lack of quality of healthy foods on campus, and family eating habits acquired as a child.

With the current population of young adults, many contradictions were also noted among barriers. For example, participants expressed that walking to the campus fitness center from their dormitory rooms was a barrier (approximately $\frac{1}{4}$ of a mile), but also expressed their willingness to walk to McDonald's, which is slightly farther in distance. Thus, it is important to consider motivators. As previously noted by Debate et al. (2001), taste preferences did motivate participants' consumption of fast food. Thus, some participants may weigh barriers along with other desires when deciding to proceed with behaviors that influence weight.

2. What sociocultural influences (such as environment, peers, and culture) support the adoption of healthy weight behaviors among college students?

Sociocultural factors supporting participants in the adoption of healthy behaviors were extracted from transcript data. These factors were supportive relationships and peers (particularly exercise partners or buddies), energy requirements for participants that are athletes, availability of healthy food of good quality, and good habits perpetuated by family upbringing. The most mentioned form of support was also one of the main sources of barriers—peers.

From the data analysis of sociocultural-supporting influences, it was clear that participants accounted for more barriers than supporters. Saturation of the barriers was not reached until focus group 12. However, supporting influences reached saturation at focus group six. Participants repeatedly noted the same supporting factors. This may be an indicator that participants do not perceive supporting influences on campus, or there may be a lack of supporting factors institutionalized on the campus.

3. What are college students' perceptions of their locus of control in relation to healthy and unhealthy weight behaviors?

Among focus group participants, there were varying levels of locus of control. Most participants' reported an internal responsibility for their weight behaviors. Likewise, participants reported internal and external factors that influence their locus of control. Participants' perceptions of locus of control concerning healthy weight behaviors were affected by the following internal factors: emotions, self-esteem, others' perception and self-image of the individual, and metabolism. External factors affecting control busy

schedules, lack of transportation, and a lack of structure (such as that experienced while in high school sports or a family presence). Interestingly, as noted in the overarching themes, perception of self and others' perceptions was highly documented when participants addressed control. This was an interesting occurrence because self-image and perceptions arose several times in many transcripts each time the locus of control was addressed. This may be because college women are at a discovery age—learning about self and the surrounding world. Therefore, image and perceptions may still be an important factor. So, agreeing to a peer's request may take precedence over other options in order to maintain certain perceptions. Thus, it may be important for future studies to analyze locus of control in relation to self-esteem, especially in the transitioning college population.

4. How do college students perceive familial influences on current healthy or unhealthy weight behaviors?

Most participants' reported that family influences impact their current healthy weight behaviors in several ways, primarily food selection and types of foods that participants prefer. Participant responses indicated that their family health behaviors were either negative or positive. More so, participants reported that they either maintained these behaviors or altered them after entering the college environment.

Family influence appeared to be an important factor, but one that participants negotiated. For example, participants spoke of habits that their parents instilled in their childhood, but also noted that these behaviors were not always maintained for a multitude of reasons. Some participants remarked that eating healthy was important, but that the

Underground's offerings could not compare to their family's cooking so they chose other options that were not as healthy. This result signifies the adult transition: participants choose which behaviors to continue and discontinue. In some cases, discontinuing a negative habit may be appropriate, but the campus culture must provide an avenue to promote the continuation of healthy habits. Nonetheless, campus dining will probably never be able to meet the eating preferences of all students, so other efforts must also focus on helping students select healthier choices. Also, researchers have found that the human brain changes significantly after 18 years of age (Knapp, 2006). Specifically, these changes are located in regions that affect cognition and emotions (Knapp). Therefore, college students are on the cusp of many of these changes—learning to negotiate themselves and the world around them.

5. What aspects of the campus culture influence healthy and unhealthy weight behaviors among college students?

Participants also had strong opinions about the campus environment and its impact on their current weight behaviors. The overall pervasive perception was that several factors on campus negatively affected weight behaviors. Participants pointed out several factors that hindered their ability to make healthier choices such as dormitory kitchen setup, stressful and pressure-filled schedules, a lack of men reportedly lessens women's need on campus to care about their appearance, peers, the availability of health food of good quality (wilted lettuce was a complaint among some students), and the amount of unhealthy choices on campus such as the C-Store and vending machines.

Participants stated many unhealthy notions about the campus, and expressed that

these observations promoted unhealthy weight behaviors on campus. However, healthy options on campus do exist. In order to compete against the appeal of unhealthy foods, the campus may need to increase the quality and quantity of healthy food on campus in order to promote healthier options on campus. More so, an intervention may need to focus on promoting healthier food selection in the midst of appealing unhealthy choices. It is important to also note that the supply and demand of healthier selections must be such that it benefits food services to order and supply the items.

6. What sources are college students accessing to gain knowledge about healthy weight behaviors?

Participants accessed a multitude of sources to obtain health information. However, some participants noted that they may access several sources, but only apply credible information from doctors or professors. This may be because participants are more willing to trust the advice of professionals. Participants also reported that they receive health information from doctors, classes (professors), physical therapists, parents, magazines, the Internet, television, friends, campus fliers, grocery stores, participant organizations, and current research findings. Thus, participants are accessing a plethora of sources to obtain health information. This may help explain the varying degrees of knowledge concerning healthy weight behaviors. Furthermore, although some participants remarked that they only apply health information from credible sources, this does not apply to all participants. Due to the wide variety of sources accessed, participants may become confused about conflicting reports from various sources. Thus, it may also be important for college campuses to display consistent, accurate health

messages to students.

Discussion and Implications

To evaluate healthy weight behaviors, the college population is an excellent source because it is suggested that many behaviors initiated in young adults may affect future obesity rates (George & Johnson, 2001). The current study verified important results reported in the literature, such as the dual nature of peers on health behaviors, perceived association between convenience and food selection, the perception of balance as healthy, and the dual role of family influences (Cason & Wenrich, 2002; Hargreaves, Schlundt, & Buchowski, 2002; House, Su, & Levy-Milne, 2006; Marquis, 2005). Likewise, other influences on healthy weight reported in the literature, such as stress were also reported in the current study (Kandiah, Yake, Jones, & Meyer, 2006; Unusan, 2006). This duplication implies that health educators and researchers must design interventions that promote healthy weight behaviors that address a multitude of factors. Results from the current study reveal that college women perceive many obstacles, but may not recognize areas of support.

On the other hand, the current study revealed two important factors that may help researchers design more effective interventions targeted at young women. For one, the data analysis revealed that at times, young women perceive false realities among their choices. This notion has also been reported in the literature concerning the limited time college women think they have to exercise—they perceive limited time, but in actuality may have several hours (Buckworth & Nigg, 2001). In the current study, participants reported that a late-night job eliminated healthy choices. However, this may

not be true if participants planned ahead to meet this challenge. In some cases, this was pointed out by other participants in the focus group as well. Future programs may find that examining their participants' perceptions of available choices is beneficial in targeting barriers and negative influences.

Second, an emergent theme from the focus group transcripts was the influence of self-image and others' perceptions on college women's current health behaviors. Some studies have reported an association between weight and various aspects of self-esteem (O'Dea & Abraham, 2000; Wardle & Cooke, 2005). Therefore, an important factor in helping women achieve and maintain healthy weight may be increasing self-esteem and confidence.

Participants' internal struggles between self and others perceptions may also be related to the internalization of the thin ideal. Several authors reported that the thin ideal and body image are correlated (Dunkley, Wertheim, & Paxton, 2001; Low et al., 2003; Stice, Spangler, & Argas, 2001; Thompson & Stice, 2001). Thus, college women may be attempting to reconcile society's perspective of acceptable weight. This internal struggle therefore, may have drastic effects on their locus of control.

Also, self-esteem and locus of control appear to influence many health choices that participants contemplated. These two concepts may also be connected to participants' internalization of perceived cultural norms, such as the thin ideal, that in return affect participants' body image. Therefore, the interventions aimed towards this population may want to study participants' perceived body image and its correlation to locus of control internalization of cultural norms.

Lastly, saturation of results was not reached until nine focus groups were analyzed because either odd or even questions were asked in each group—7 groups answered all even numbered questions, and 7 groups answered all odd numbered questions (A. Love, personal communication, August 27, 2006). Furthermore, the sampling method may limit the generalizability of the results found with the current study because a convenience sample was utilized. However, the diversity among the sample also suggests that weight struggles among ethnicities may not be as divergent as previously thought.

Recommendations

Based on the study results and findings, the following recommendations are suggested.

1. The current study did not stratify college women of varying ethnicities and document differences. Therefore, it is recommended that future research entail stratification among ethnicities to better understand the varying effects of described barriers and factors to develop methods for college women. For example, stress may be a prevalent factor among all women, but preoccupation about others' perceptions may not be present among all women.
2. Researchers must verify the impact of self-esteem, self-image, and others' perceptions on the weight behaviors that young women adopt.
3. Researchers must also further study students' perceptions of choices, and factors that influence "false" realities through a variety of quantitative and

qualitative methods to determine the depth of this phenomenon throughout the young adult population.

4. Researchers must continue to understand the associations between body image, locus of control, and internalization of cultural norms. These relationships may predict participants' weight-related behaviors.
5. Lastly, it would be interesting to verify the presence of (or lack of) the aforementioned findings in a young male sample.

Creating studies that seek to understand the multitude of factors that influence weight behaviors will help researchers understand and alleviate the current obesity epidemic. As society evolves, intervention studies must evolve also, and seek to understand the changing facets of culture and life experiences that shape health habits.

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APPENDIX A

Institutional Review Board Approval



Institutional Review Board

Office of Research and Sponsored Programs
P.O. Box 425614, Denton, TX 76204-5614
940-879-3378 Fax 940-879-3416
e-mail: IRB@twu.edu

April 2, 2007

Ms. Jamecia L. Finnie
146 Valley View Drive, Apt. 217
Lewisville, TX 75067

Dear Ms. Finnie:

Re: An Analysis of Psychosocial Constructs of Weight Behaviors among College Women

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because you do not use a signed consent form in your study, the filing of signatures of participants with the TWU IRB is not required.

Further review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. David Nichols, Chair
Institutional Review Board - Denton

cc. Dr. Gay James, Department of Health Studies
Dr. Anna Love, Department of Health Studies
Graduate School

APPENDIX B
Demographics Questionnaire

DIRECTIONS: Please answer the following as completely and honestly as possible. YOUR ANSWERS ARE COMPLETELY CONFIDENTIAL. DO NOT WRITE YOUR NAME ON THIS SURVEY.

Age _____ yrs

Gender (please circle) Male Female

Martial Status (please circle) single married divorced
widowed

Race/Ethnicity

- ☐ African America
- ☐ Asian American
- ☐ European American
- ☐ Latin American
- ☐ Native/Pacific Islander
- ☐ Other _____

Classification

- ☐ Graduate Student
- ☐ Post-Baccalaureate
- ☐ Senior
- ☐ Junior
- ☐ Sophomore
- ☐ Freshman
- ☐ Other _____

Socio-economic Status

(pick the one you identify with)

- ☐ Lower Socio-economic
- ☐ Lower Middle Socio-economic
- ☐ Middle Socio-economic
- ☐ Upper Middle Socio-economic
- ☐ Upper Socio-economic
- ☐ Other _____

Do you have children?

- ☐ yes If yes, how many _____
- ☐ no

Have you ever been diagnosed with an eating disorder? (Please check all which apply)

- ☐ Yes

If so, what was the diagnosis?

- ☐ Anorexia
- ☐ Bulimia
- ☐ Binge Eating
- ☐ EDNOS
- ☐ Other _____

- ☐ no

DIRECTIONS: For the following questions, please circle the number which best describes you.

Are you currently on a diet? (Restricting your food in order to lose weight)

1	2	3	4	5
not at all		some of the time	No concern	most of the time
strictly				

Are you satisfied with your body weight?

1	2	3	4	5
not satisfied	somewhat unsatisfied		No concern	moderately satisfied
satisfied				Highly

Are you satisfied with your body shape?

1	2	3	4	5
not satisfied	somewhat unsatisfied		No concern	moderately satisfied
satisfied				Highly

Are you satisfied with your current nutritional habits?

1	2	3	4	5
not satisfied	somewhat unsatisfied		No concern	moderately satisfied
satisfied				Highly

Are you satisfied with the amount of physical activity you get?

1	2	3	4	5
not satisfied	somewhat unsatisfied		No concern	moderately satisfied
satisfied				Highly

How interested are you in receiving information on nutrition?

1	2	3	4	5
not interested	somewhat interested	No concern	moderately interested	Highly
interested				

How interested are you in receiving information on physical activity?

1	2	3	4	5
not interested	somewhat interested	No concern	moderately interested	Highly
interested				

How interested are you in receiving information on body image?

1	2	3	4	5
not interested	somewhat interested	No concern	moderately interested	Highly
interested				

How interested are you in receiving information on eating disorders?

1	2	3	4	5
---	---	---	---	---

not interested somewhat interested No concern moderately interested Highly interested

Please *circle* all the sources in which you currently receive nutrition information. (circle all that apply)

FAMILY DOCTORS	FRIENDS	CO-WORKERS	EDUCATORS
DIETITIANS MAGAZINES	HEALTH ORGANIZATIONS TELEVISION	HEALTH	
RADIO MAGAZINES	NEWSPAPER	ONLINE	BEAUTY/FASHION
WEBSITES	OTHER _____		

Please *circle* all the sources in which you might want to receive nutrition information. (circle all that apply)

FAMILY DOCTORS	FRIENDS	CO-WORKERS	EDUCATORS
DIETITIANS MAGAZINES	HEALTH ORGANIZATIONS TELEVISION	HEALTH	
RADIO MAGAZINES	NEWSPAPER	ONLINE	BEAUTY/FASHION
WEBSITES	OTHER _____		

Please *circle* all the sources in which you currently receive physical activity information. (circle all that apply)

FAMILY DOCTORS	FRIENDS	CO-WORKERS	EDUCATORS
DIETITIANS MAGAZINES	HEALTH ORGANIZATIONS TELEVISION	HEALTH	

RADIO
MAGAZINES

NEWSPAPER

ONLINE

BEAUTY/FASHION

WEBSITES

OTHER _____

Please *circle* all the sources in which you might want to receive physical activity information. (circle all that apply)

FAMILY
DOCTORS

FRIENDS

CO-WORKERS

EDUCATORS

DIETITIANS
MAGAZINES

HEALTH ORGANIZATIONS
TELEVISION

HEALTH

RADIO
MAGAZINES

NEWSPAPER

ONLINE

BEAUTY/FASHION

WEBSITES

OTHER _____

Please *circle* all the sources in which you currently receive body image information. (circle all that apply)

FAMILY
DOCTORS

FRIENDS

CO-WORKERS

EDUCATORS

DIETITIANS
MAGAZINES

HEALTH ORGANIZATIONS
TELEVISION

HEALTH

RADIO
MAGAZINES

NEWSPAPER

ONLINE

BEAUTY/FASHION

WEBSITES

OTHER _____

Please *circle* all the sources in which you might want to receive body image information. (circle all that apply)

FAMILY	FRIENDS	CO-WORKERS	EDUCATORS
DOCTORS			
DIETITIANS	HEALTH ORGANIZATIONS		HEALTH
MAGAZINES	TELEVISION		
RADIO	NEWSPAPER	ONLINE	BEAUTY/FASHION
MAGAZINES			
WEBSITES	OTHER	_____	

If yes, how often would you like to receive information?

- ☐ Daily
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ bi-monthly
- ☐ monthly
- ☐ every 3-6 months
- ☐ once a year

Please circle all the obstacles you may feel interfere with maintaining a healthy life. (circle all that apply)

SCHOOL	TIME	INFORMATION	CHILDCARE
MONEY			
MOTIVATION	GEOGRAPHIC LOCATION	RELATIONSHIPS	
KNOWLEDGE	SKILL		
OTHER	_____		

DIRECTIONS: For the following questions please check the box next to the answer that best describes you.

In general, you would describe your current health as:

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

Currently, you perceive yourself as:

- ☐ Underweight
- ☐ Normal weight
- ☐ Somewhat overweight
- ☐ Very overweight
- ☐ Obese

In general, how many times a

day

do you eat a meal (not including

snacks)?

- ☐ Once a day
- ☐ Twice a day
- ☐ 3 times a day
- ☐ 4 times a day
- ☐ 5 times a day
- ☐ Greater than 5 times a day

How many times a day to you eat a snack?

- ☐ Once a day
- ☐ Twice a day
- ☐ 3 times a day
- ☐ 4 times a day
- ☐ Greater than 4 times a day

Where do you usually obtain your meals?

- ☐ Fast food style dining **on** campus
- ☐ Fast food style dining **off** campus
- ☐ Sit down style dining **on** campus (including “to-go” meals from The Underground)
- ☐ Sit down style dining **off** campus
- ☐ Vending machines
- ☐ Convenience store (including C-Store in dormitories)
- ☐ Grocery store
- ☐ Home preparation

Where do you usually obtain your snacks?

- ☐ Fast food style dining **on** campus
- ☐ Fast food style dining **off** campus
- ☐ Sit down style dining **on** campus (including “to-go” meals from The Underground)
- ☐ Sit down style dining **off** campus
- ☐ Vending machines
- ☐ Convenience store (including C-Store in dormitories)
- ☐ Grocery store

☐ Home preparation

Please specify, in ounces, the amount of the following beverages you consume on average per day (one can of soda equals 12 oz)

_____ Water
_____ Juice
_____ Milk
_____ Regular soft drinks
_____ Diet soft drinks
_____ Alcoholic beverages
_____ Coffee/Tea
_____ Energy drinks (i.e. Red Bull, Monster, and Adrenaline Rush)
_____ Other (please describe _____)

Are you familiar with the 2005 Dietary Guidelines for Americans?

- ☐ Yes
☐ No

The following questions relate to specific foods and vitamin intake.

How many servings of fish per week do you eat on average (number per week)?

_____ oily fish (salmon, herring, mackerel, sardines, albacore or white tuna)
_____ shell fish (shrimp, lobster, crab)
_____ white fish (fish sticks, catfish, light tuna)
_____ other, If so, describe:

What is the usual method of cooking used in the preparation of the fish if eaten?

- ☐ Boiled
☐ Fried
☐ Broiled
☐ Sautéed
☐ Breaded

When you cook, what type of oil do you use most often?

- ☐ Safflower

- ☐ Canola
- ☐ Peanut
- ☐ Olive
- ☐ Vegetable

Do you take any of the following supplements? (Check all that apply, circle day or week as appropriate)

- ☐ Daily multivitamin. If so, what brand? _____
- ☐ Fish Oil. If yes, how often? _____
- ☐ Flax Seed. If yes, how often? _____
- ☐ Arginine. If yes, how often? _____
- ☐ Creatine. If yes, how often? _____
- ☐ Evening primrose oil. If yes, how often? _____
- ☐ Vitamin C. If yes how often? _____
- ☐ St. John's Wort. If yes, how often? _____
- ☐ Glutamine. If yes, how often? _____

The following questions relate to your oral health habits.

Which of the following oral health behaviors do you practice? (Check all that apply)

- ☐ Daily brushing. If so, how many times per day? _____
- ☐ Daily flossing
- ☐ Annual oral health check up including cleaning
- ☐ Annual cleaning only

Do your gums have a tendency to bleed:

When you brush?

- | | | |
|--------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Always |
|--------------------------------|------------------------------------|---------------------------------|

When you floss?

- | | | |
|--------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Always |
|--------------------------------|------------------------------------|---------------------------------|

When you eat?

- | | | |
|--------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Always |
|--------------------------------|------------------------------------|---------------------------------|

Spontaneously?

- | | | |
|--------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Always |
|--------------------------------|------------------------------------|---------------------------------|

APPENDIX C

Focus Group Guide

Describe a healthy college student for me.

We are trying to find out what influences college students with regard to their health.

What are some influences *you* would say are important?

Think about your classmates, colleagues, or just students you see on campus. Tell us your perceptions about the current eating habits of the TWU college student population.

What factors (both positive and negative) influence these eating habits?

Think about these same individuals on campus. Tell us your perceptions about the physical activity habits of the college population here at TWU.

What factors (both positive and negative) affect participating in physical activity on a daily or weekly basis?

What aspects of college students' lifestyles relate to their health?

How much control do you think that college students perceive to have over their health or health behaviors? What do you think limits this control and why?

What is the single most important thing a person could change that would affect his/her lifestyle positively?

Do you believe the family a person grows up in plays a role in lifestyle decisions as a young adult? If so, how? What else might be a strong influence?

Does current health information influence daily decisions of the college student? If so, how and where is this information received (TV, radio, Internet, class, classmates, the dorm, flyers on cars, etc.)?

Has the discussion today addressed situations that you or your friends encounter in trying to make healthy choices? If not, what might be another cause of unhealthy behaviors or barriers to implementing healthy behaviors?