

DISSERTATION

SOCIAL NORMS THEORY AND EXERCISE, NUTRITION, AND SEXUAL
BEHAVIORS AND THEIR RELATIONSHIP TO PERCEPTION OF HEALTH IN
FEMALE AND MALE COLLEGE STUDENTS

Submitted by

Christina Buchanan

School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Summer 2008

UMI Number: 3332744

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI[®]

UMI Microform 3332744

Copyright 2008 by ProQuest LLC.

All rights reserved. This microform edition is protected against unauthorized copying under Title 17, United States Code.

ProQuest LLC
789 E. Eisenhower Parkway
PO Box 1346
Ann Arbor, MI 48106-1346

COLORADO STATE UNIVERSITY

April 9, 2008

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY CHRISTINA BUCHANAN ENTITLED SOCIAL NORMS THEORY AND EXERCISE, NUTRITION, AND SEXUAL BEHAVIORS AND THEIR RELATIONSHIP TO PERCEPTION OF HEALTH IN FEMALE AND MALE COLLEGE STUDENTS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Shen Fennell

Shen Fennell

Walter M. Schubert

Walter M. Schubert

Timothy S. Blawie

Timothy S. Blawie

Adviser

Charles Kennedy

Charles Kennedy

Co-Adviser

Timothy S. Blawie

Timothy S. Blawie

Department Head/Director

ABSTRACT OF DISSERTATION

SOCIAL NORMS THEORY AND EXERCISE, NUTRITION, AND SEXUAL BEHAVIORS AND THEIR RELATIONSHIP TO PERCEPTION OF HEALTH IN FEMALE AND MALE COLLEGE STUDENTS

The purpose of this study was to examine Colorado State University students' exercise, nutrition, weight management, and sexual behaviors that may enhance disease prevention and those behaviors' relationship to students' perceived health. A secondary purpose of this research was to examine how students' perceptions of their peers' sexual behaviors influenced their own sexual behaviors based on social norms theory (SN). The instrument used was the American College Health Association-National College Health Assessment (ACHA-NCHA). The subjects were female and male college students 18-25 years old, N = 2890. Data analysis: descriptive statistics, Pearson's *r*, Spearman *rho*, ANOVA, and Mann Whitney *U* tests were used. Results: 42.4% did not meet current exercise recommendations, 94.3% did not eat 5 fruits and vegetables (FV) per day, 61.4% of females and 23.1% of males were trying to lose weight, 77.1% of females and 65.1% of males were at the desired weight (BMI), 25.9% never used condoms, 35.0% always used condoms, 27.1% had 0 sexual partners (SP) in the past year, 1.3% thought the typical student had 0 SP, 10.7% had vaginal intercourse (VI) 1-2 times in the past month versus 27.6% that thought the typical student had VI 1-2 times. Correlations and ANOVAS: perceived health (PH); and exercise, FV, and BMI were significantly correlated ($p < 0.01$). Exercise, FV, weight management (WM), and BMI were

significantly different between females and males. There were no significant correlations between PH and sexual behaviors (condom use (C), SP, VI). Typical student condom use (TC), typical student SP (TSP), VI, and typical student VI (TVI) were significantly different between females and males. SN and sexual behavior: SP and TSP; and VI and TVI were significantly correlated ($p < 0.01$), C and typical student condom use were not significant. Conclusions: this sample of students took exercise, nutrition, WM, and BMI into account when self-assessing their health (PH). Students did not take sexual behaviors into account when self-assessing their health. Students seemed to be influenced by their perception of their peers' behavior with regard to sexual behaviors, according to social norms theory. Females and males differ in health practices and perceptions.

Christina Buchanan
School of Education
Colorado State University
Fort Collins, CO 80523
Summer 2008

Acknowledgements

There were many people that helped make this whole process possible. I would first like to thank Dr. Cathy Kennedy. Dr. Kennedy was my Master's degree advisor and she has selflessly advised me both academically and personally ever since. Cathy, thank you for your faith in me from the start. I would also like to thank Dr. Timothy Davies. Dr. Davies helped me figure out that there is more than one solution to a problem, and for that I am truly grateful. Dr. Ellyn Dickmann thank you for all your help and advice, not only did you enhance my understanding of research, but you also helped me really enjoy the process. Dr. Sharon Anderson and Sheri Linnell thank you both for asking great questions. I would also like to acknowledge the people I work with. The OLRM/ESS department at Western State College is a fabulous group of people. Their support and encouragement helped me stay sane, on track, and laughing all the while. Thank you Dr. Brooke Moran – you are a true friend – your help and support through this process was invaluable. Thank you Patrick Muckleroy for your awesome library skills, you made doing research from afar possible. Finally, I would like to thank my family, especially my mother and husband. Possibilities are endless with such an amazing cheering squad.

Table of Contents

Title Page.....	i
Signature Page.....	ii
Abstract.....	iii
Acknowledgements.....	v
Table of Contents.....	vi
List of Tables.....	viii
Chapter I: Introduction	1
Purpose of Study.....	4
Background/Overview.....	5
Overweight, Obesity, and Physical Inactivity.....	5
Exercise, Nutrition, and Weight Management.....	6
Sexual Behavior.....	7
Social Norms Theory and Sexual Behavior.....	8
Conclusion.....	8
Statement of the Research Problem.....	9
Research Questions.....	10
Definition of Terms.....	12
Study Limitations and Delimitations.....	14
Significance of the Study.....	15
Researcher’s Perspective.....	16
Chapter II: Literature Review.....	18
Introduction.....	18
Overweight, Obesity, and Physical Inactivity.....	19
Exercise and Nutrition.....	23
Weight Management.....	27
Sexual Behavior.....	28
Condom Use.....	30
Social Norms Theory.....	31
Social Norms Theory – Number of Sexual Partners.....	32
Conclusions.....	35
Chapter III: Methods.....	37
Overview of Study.....	37
Research Design and Rational.....	37
Purpose of Survey Research and Potential Error in Survey Research.....	38
Limitations of Survey Research.....	40
Strengths of Survey Research.....	40
Participants and Site.....	41
Data Collection.....	42
Measures.....	43
Data Analysis.....	46
Summary.....	51
Chapter IV: Results.....	53
Descriptive Statistics.....	56
Perceived Health.....	58

Table of contents continued	
Exercise.....	59
Nutrition.....	59
Weight Management.....	60
Body Mass Index.....	61
Condom Use.....	61
Number of Sexual Partners.....	63
Vaginal Intercourse Frequency.....	64
Correlations.....	67
Area One.....	68
Area Two.....	73
Area Three.....	77
Chapter V: Discussion.....	80
Area One.....	83
Exercise.....	83
Nutrition.....	87
Weight Management and Body Mass Index.....	89
Area Two.....	92
Condom Use.....	93
Number of Sexual Partners.....	95
Vaginal Intercourse Frequency.....	97
Area Three: Social Norms and Sexual Behavior.....	98
Conclusion.....	103
Limitations.....	105
Recommendations.....	107
References.....	112
Appendix A: American College Health Association-National College Health Assessment..	119

List of Tables

Table 4.1 Frequencies: Age and Year in School: Total Sample.....	56
Table 4.1 Descriptive Statistics all Variables.....	57
Table 4.3 Frequencies: Perceived Health.....	58
Table 4.4 Frequencies: Days per Week of Vigorous Exercise.....	59
Table 4.5 Frequencies: Nutrition Recommendations Servings of Fruits and Vegetables per Day.....	60
Table 4.6 Frequencies: Weight Management.....	61
Table 4.7 Frequencies: Body Mass Index Classification.....	62
Table 4.8 Frequencies: Condom Use During Vaginal Intercourse in the Past 30 Days, Typical Student Condom Use During Vaginal Intercourse in the Past 30 Days.....	62
Table 4.9 Condom Use the Last Time Vaginal Intercourse.....	63
Table 4.10 Frequencies: Number of Sexual Partners in the Past Year.....	65
Table 4.11 Frequencies: Number of Sexual Partners of Typical Student in the Past Year.....	66
Table 4.12 Frequencies: Vaginal Intercourse in the Past Month and Typical Student Vaginal Intercourse in the Past Month.....	67
Table 4.13 Correlations between Perceived Health and Area One Variables: Total Sample..	69
Table 4.14 Correlations between Perceived Health and Area One Variables: Females.....	69
Table 4.15 Correlations between Perceived Health and Area One Variables: Males.....	70
Table 4.16 ANOVA Perceived Health, Exercise, Nutrition, and Weight Management, between Females and Males.....	72
Table 4.17 Correlations between Perceived Health and Area Two Variables: Total Sample..	73
Table 4.18 Correlations between Perceived Health and Area Two Variables: Females.....	74
Table 4.19 Correlations between Perceived Health and Area Two Variables: Males.....	74
Table 4.20 ANOVA Condom Use, Typical Student Condom Use, Condom Use Last Time Vaginal Intercourse, Vaginal Intercourse, and Typical Student Vaginal Intercourse.....	76
Table 4.21 Area Three: Social Norms Theory and Sexual Behaviors Correlations: Total Sample.....	78
Table 4.22 Area Three: Social Norms Theory and Sexual Behaviors Correlations: Females	79
Table 4.23 Area Three: Social Norms Theory and Sexual Behaviors Correlations: Males....	79

Chapter I

Introduction

Introduction

Health is multidimensional. There are many aspects of health¹ that may be taken into account when protecting oneself against disease. These factors fall into seven established categories: physical; social; emotional; mental; spiritual; occupational; and environmental (Hoeger, Turner, & Hafen, 2002 in Hoeger & Hoeger, 2006). In essence, considering and acting on all of these factors of health may help one stave off disease. In reality, however, many people when considering their own health focus primarily on the physical aspect of health and neglect some or all of the other areas (Cason & Wenrich, 2002; Hargrove & Keller, 1993). Having a sound awareness and practice of the various aspects of health is important for overall good health and disease prevention.

Unfortunately, based on the current health status of many Americans it seems that many of these realms of health are being neglected.

Over the past four decades, the health of much of the American population has been steadily declining. The most alarming changes in health have been primarily in rates of obesity and overweight in Americans (U.S. Department of Health and Human

¹ Health and wellness are technically differentiated from each other, yet are often used interchangeably. Following are the definitions for health and wellness to show their relationship to each other. Health is defined as: a state of complete well-being – not just the absence of disease or infirmity (Hoeger & Hoeger, 2006).

Wellness is defined as: The constant and deliberate effort to stay healthy and achieve the highest potential for well-being. It encompasses seven dimensions – physical, emotional, mental, social, environmental, and spiritual – and integrates them all into a quality life (Hoeger & Hoeger, 2006).

Services, 2000). It is currently estimated that 66% of American adults are overweight and exactly half (33%) of these people are obese (National Center for Health Statistics, 2007a). What is more alarming is the apparent shift between healthy body weight and overweight, or obesity, that seems to occur between childhood and adulthood. Approximately 17% of children ages 12-19 years old are considered overweight (National Center for Health Statistics, 2007b). The shift seems to occur starting in young adulthood and steadily increases throughout adulthood. Obesity and overweight do not just occur but in most cases happen due to positive energy balance (i.e., greater energy intake than output). Two contributing factors to obesity and overweight therefore are physical inactivity and poor nutrition. Most American adults (60%) do not get enough physical activity to incur health benefits (U.S. Department of Health and Human Services, 1996), and most do not eat the recommended amount of fruits and vegetables (U.S. Department of Health and Human Services, 2000). These inadequacies in physical activity and nutrition are two major contributing factors to the poor health of American adults. At the same time, with these issues in mind, there seems to be a distorted emphasis placed on factors like body weight, nutrition, and physical activity when defining health (Cason & Wenrich, 2002; Hargrove & Keller, 1993). Other components that are less stressed include risky sexual behaviors that can have a lasting impact on one's health.

The reported rate of curable sexually transmitted diseases (STD) in the United States is dramatically higher than in other industrialized countries. For instance, in a report by the Institute of Medicine, there were 149.5 cases of gonorrhea per 100,000

persons per year in the United States compared to 34.1 per 100,000 in England and 18.6 per 100,000 in Canada (Eng & Butler, 1997). In addition, it is estimated that 12 to 19 million Americans are infected with an STD each year. Among cases of disease, 87% are STDs, and account for five of the top ten most reported diseases (Centers for Disease Control, 2006; Eng & Butler, 1997). Two factors that are directly correlated to STD infection are (1) number of sexual partners and (2) condom use. The Institute of Medicine (Eng & Butler, 1997) reported that greater number of sexual partners increased one's risk of contracting an STD. Additionally, they indicated that lack of barrier contraceptive use was also a risk factor for STD infection and that consistent condom use decreased this risk.

Many students are on their own for the first time in their lives when they go to college. With this freedom comes greater responsibility for all areas of their lives. This responsibility includes care of the physical self. For the most part students can choose to be physically active or not, eat what and when they want to, and they may be engaging in sexual activity for the first time or at the very least under less supervision than in high school. Many students consider their health something to worry about when they are older and that their health practices will become healthier after college (Cason & Wenrich, 2002). Data report that the greatest increases in body weight, inactivity, and STDs occur in 18-24 year olds (Huang, Harris, Lee, Nazir, Born, & Kaur, 2003; Mokdad, Serdula, Dietz, Bowman, Marks, & Koplan, 1999), and that these numbers do not decrease, in fact they increase, across adulthood; this thinking is unsound. Thus, it seems that students may be misperceiving their health status because they think their poor health

practices will be short lived while they are in college and underestimate the level of permanence of their college lifestyle after graduation. There is also a skewed emphasis placed on exercise and nutrition alone as markers of health and less importance placed on other factors such as sexual behavior, spiritual health, and social health (Cason & Wenrich, 2002).

Students' self perception of health and health practices are not necessarily impacted solely by the individual. These beliefs and practices may be influenced by what the individual presumes others to be doing. "Social norms theory states that behavior is often influenced by how individuals perceive that other members of a social group behave, and that beliefs regarding this practice are often incorrect." (Scholly, Katz, Gascoigne, & Holk, 2005, p. 160). If students believe others are engaging in a behavior, regardless of reality, they will be more likely to engage in that behavior themselves. There has been much research on alcohol use in college students using social norms theory but less on sexual behavior in students (Berkowitz, 2004). Because alcohol abuse and risky sexual behavior are two topics about which many people and institutions do not talk freely, associated details are elusive. If people feel they cannot openly discuss these topics, they are left to their assumptions that may drive unhealthy or risky behavior.

Purpose of Study

The purpose of this study was to examine Colorado State University (CSU) students' exercise, nutrition, weight management, and sexual behaviors that may enhance disease prevention and those behaviors' relationship to students' perceived health. A secondary purpose of this research was to examine how students' perceptions of their

peers' sexual behaviors influenced their own sexual behaviors based on social norms theory. The instrument that was used to test these questions was the American College Health Association – National College Health Assessment (ACHA-NCHA), see appendix A. In the future, this information may be used to create health promotion programs on CSU's campus for all students. The specific independent variables that were investigated include: body mass index (BMI) classification; weight management; exercise frequency; nutrition practices; condom use; number of sexual partners in the past year; and frequency of vaginal intercourse in the past month. Body mass index was used as an indicator of current health status. The dependent variable was defined as student perceived health. Additionally, the sexual behaviors (i.e., condom use, number of sexual partners, and frequency of vaginal intercourse) were examined using analysis strategies grounded in social norms theory as well as correlating these variables to the dependent variable.

Background/Overview

This study examined four areas of health: (1) overweight, obesity, and physical inactivity; (2) exercise, nutrition, and weight management; (3) sexual behavior; and (4) social norms related to sexual behavior. The following section will provide a brief overview of each of these areas of study.

Overweight, Obesity, and Physical Inactivity

Several studies have addressed college health norms and practices. The transition into college has been reported to be accompanied by increased weight gain and decreased physical activity (Douglas & Collins, 1997; Hoffman, Policastro, Quick, & Lee, 2006;

Huang et al., 2003; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). If childhood and adulthood are linked by the years in college, increases in body weight and decreases in physical activity beginning in college and carrying through to adulthood and beyond become apparent.

Generally, there is an increase in body weight between freshman and senior year of college (Douglas & Collins, 1997; Hoffman et al., 2006; Huang et al., 2003; Racette et al., 2005), as well as an increase in overweight and obesity in students between these years (Douglas & Collins, 1997; Huang et al., 2003). Concomitant with these changes in weight is also a decline in physical activity in college students (Racette et al., 2005). Some factors that may influence these trends in weight gain are decreased formal exercise and poor nutrition.

Exercise, Nutrition, and Weight Management

In addition to changes in body weight and the specific rise in overweight and obesity there is also a decline in moderate and vigorous exercise in college students compared to high school students (Payne & Issacs, 2005); most college students do not meet the recommended amount of exercise per week (American College Health Association, 2005; Anding, Suminski, & Boss, 2001; Douglas & Collins, 1997; George, 2000; Haberman & Luffey, 1998; Huang et al., 2003). Further, most students do not eat the recommended amounts of fruits and vegetables per day (American College Health Association, 2005; Anding et al., 2001; Cason & Wenrich, 2002; Connell, Simmermann, Stewart, Foy, & Nettles, 2005; Douglas & Collins, 1997; Haberman & Luffey, 1998;

Huang et al., 2003). Specifically, from the studies above, only a minority (from 2% to approximately 30%) eat at least five servings of fruits and vegetables per day combined.

Interestingly, some studies that investigated weight management in students reported that many students were trying to lose weight even if they were currently at a healthy body weight, while others who were not at a healthy body weight reported not trying to do anything about their weight or even trying to gain weight (Connell et al., 2005; Haberman & Luffey, 1998; Volicer, Quattrocchi, Candelieri, & Nicolosi, 2003). With regard to healthy body weight there seems to be a discrepancy between what is considered to be healthy and where students fall in relation to health and body weight.

Sexual Behavior

One area of health that is often overlooked by college students is sexual behavior (Cason & Wenrich, 2002). Several studies have examined sexual behavior in college students. Two areas of focus have been inconsistent condom use and number of sexual partners, both of which are behaviors that are associated with increasing the risk of STDs. These studies have shown that of sexually active college students approximately 30% reported using a condom during their last sexual intercourse (American College Health Association, 2002; American College Health Association, 2005; Douglas & Collins, 1997). On average students reported using condoms just 30% of the time they had sexual intercourse (Scholly et al., 2005; Tulloch, McCaul, Miltenberger, & Smyth, 2004). These results suggest that students are using other forms of birth control and are not concerned about STDs, that they are neither worried about pregnancy nor STDs, or that they are unaware of the risks of not using condoms (or some other barrier method) during sex.

These studies have also shown that many students are engaging in sex with several partners per year or in their lifetime.

Social Norms and Sexual Behavior

As stated previously, social norms theory is based on the principle that when students perceive that others are engaging in a behavior (and their level of engagement), they will be more likely to engage in that behavior. For example, if students perceive their peers to be binge drinking several nights per week, they will be more likely to also binge drink several nights per week. Much research has been conducted using social norms to study alcohol use in college students (Berkowitz, 2004). Less research has examined sexual behavior and social norms theory. Of the completed research using social norms theory, researchers have discovered that by and large more students are perceived by their peers to be having sex, having more sexual partners, and using condoms less often than they actually are (American College Health Association, 2005; Martens, Mowry, Damann, Taylor, & Cimini, 2006; Page, Hammermeister, & Scanlan, 2000; Scholly et al., 2005).

Conclusion

The diseases that are the greatest cause of mortality in the United States include heart disease and cancer, and lifestyle has a major impact on one's risk for these diseases. The lifestyle factors that are most closely associated with heart disease and some cancer prevention include maintaining a healthy body weight and body composition, getting the recommended level of physical activity, and eating a well rounded diet (that emphasizes fresh fruits and vegetables, low fat, low sugar, lean protein, and high fiber). In addition,

STDs have been associated with certain cancers, particularly cervical cancer in women (Eng & Butler, 1997). Two methods to limit STDs and their health ramifications are to use a barrier contraceptive method, such as condoms, and to limit sexual partners. When college students leave home and start to have a greater level of responsibility over their health, they begin what seems to be a downward spiral with regard to health practices. These practices may carry over into later adulthood and certainly could be the precursor of poor health and disease later in life.

Statement of the Research Problem

Existing research states that overweight, obesity, inactivity, poor nutritional practices, and risky sexual behaviors are issues that negatively impact many Americans' health starting during adulthood and carrying on in later adulthood. The researcher's experiences and observations teaching in the Exercise and Sport Science program at Western State College of Colorado confirm that many students in this population make very unhealthy nutrition choices, regardless of their physical activity level. In addition many students overestimate their levels of fitness and energy requirements which could in turn lead to over consumption of food and overweight or obesity and all the health ramifications of these conditions.

The college years are a time when students may become sexually active or increase their sexual activity. Two issues that can have an effect on student health are number of sexual partners and self-protection against STDs. There is a strong positive correlation between the number of sexual partners that a person has and the risk that person runs of contracting an STD. Issues of self-protection, via condom use, may be

complicated as quite often sex is combined with drinking or illicit drug use. These behaviors do not lend themselves to taking precautions to prevent STDs as decision making skills are often impaired when inebriated.

Based on the issues outlined above this study endeavored to investigate the current health status, health behaviors, and health perceptions in female and male college students at CSU to examine whether or not they follow the health trends delineated in the literature or if they fall outside these trends. This study also aimed to determine if there were one or more health behaviors that college students engaged in that they considered to be more important than other behaviors when they self-assessed their health. Finally, this study investigated whether or not students' sexual behaviors were influenced by perceptions of their peers' sexual behaviors based on the social norms theory.

Analyzing this information provided important insight into the health status and perceptions of CSU college students that could in turn be used in formulating health programs at CSU in the future. Social norms campaigns have been established on several college campuses nationwide (Berkowitz, 2004). The results of these campaigns have been mixed. This research indicates that the sexual behaviors and perceptions of others' behaviors mirror the existing literature, which may help in establishing a social norms or social marketing campaign on CSU's campus. This will be discussed in more detail in chapter five.

Research Questions

The research questions addressed the following areas: (1) exercise, nutrition, and weight management; (2) sexual behavior; and (3) social norms and sexual behavior.

Area one: What is the relationship between students' perceived health and preventative health practices related to exercise, nutrition, and weight management in female and male college students? Area one was broken down into four sub-questions:

1a) What is the relationship between perceived health and number of exercise sessions in the last seven days?

1b) What is the relationship between perceived health and meeting, or not meeting, the recommended five servings of fruits and vegetables per day?

1c) What is the relationship between perceived health and weight maintenance or weight loss?

1d) What is the relationship between perceived health and BMI?

Area two: What is the relationship between perceived health and preventative health practices related to condom use, number of sexual partners, and vaginal intercourse in female and male college students? Area two was broken down into three sub-questions:

2a) What is the relationship between perceived health and condom use?

2b) What is the relationship between perceived health and number of sexual partners in the past year?

2c) What is the relationship between perceived health and vaginal intercourse frequency?

Area three: Social norms theory and sexual behavior. What is the correlation between perception of peer sexual behavior and individual sexual behavior in female and male college students? Area three was broken down into three questions:

3a) Is there a correlation between students' perception of frequency of peer condom use and their own frequency of condom use in the past month?

3b) Is there a correlation between how many sexual partners students perceive the typical student has had in the past year and how many sexual partners they have had in the past year?

3c) Is there a correlation between students' perception of frequency of peer vaginal intercourse in the past month and frequency of their own vaginal intercourse in the past month?

Definition of Terms

Body Mass Index (BMI): Weight classification based on the relationship between body weight in kilograms over height in meters squared. BMI of 25-29.9 kg/m² classifies overweight, BMI \geq 30 kg.m² classifies obese (American College of Sports Medicine (ACSM), 2006).

Exercise: a type of physical activity that requires planned, structured, and repetitive bodily movement to improve or maintain one or more components of physical fitness (Hoeger & Hoeger, 2006). The general exercise recommendation is 3-5 days per week, 20-60 minutes per session. Vigorous exercise can be done for shorter periods of time (20 minutes is sufficient), moderate or low intensity exercise should be performed for a longer period of time (closer to 60 minutes) (ACSM, 2006).

Health: A state of complete physical, mental and social well-being and not just the absence of disease or infirmity (WHO, 2007).

Nutrition recommendations: Nutrition recommendations are revised every five years through the U.S. Department of Health and Human Services and the U.S. Department of Agriculture. The current (2005) nutrition recommendations with regard to fruits and

vegetables for a 2000 calorie diet are 2 cups (four servings) of fruit and 2 ½ cups (five servings) of vegetables. The previous (2000) recommendations for fruits and vegetables were 2-4 servings of fruit and 3-5 servings of vegetables (US Department of Health and Human Services, 2005).

Obesity: An excessive accumulation of body fat, usually at least 30 percent above the recommended body weight (Hoeger & Hoeger, 2006). An adult who has a BMI of 30 or higher is considered obese (Centers for Disease Control and Prevention, 2007a).

Overweight: An excess amount of weight against a given standard, such as height or recommended percent body fat (Hoeger & Hoeger, 2006). An adult who has a BMI between 25 and 29.9 is considered overweight (Centers for Disease Control and Prevention, 2007a).

Physical Activity: Bodily movement produced by the skeletal muscles; requires expenditure of energy and produces progressive health benefits. Examples include walking, taking the stairs, dancing, gardening, etc. (Hoeger & Hoeger, 2006).

Sexually Transmitted Disease (STD): “STDs are behavior-linked diseases that result from unprotected sex. Behavioral, biological, and social factors contribute to the likelihood of contracting an STD” (Eng & Butler, 1997, p. 69).

Social Norms Theory: “The social norms approach provides a theory of human behavior that has important implications for health promotion and prevention. It states that our behavior is influenced by incorrect perceptions of how other members of our social groups think and act” (Berkowitz, 2004, p. 5).

Wellness: The constant and deliberate effort to stay healthy and achieve the highest potential for well-being. It encompasses seven dimensions – physical, emotional, mental, social, environmental, occupational, and spiritual – and integrates them all into a quality life (Hoeger & Hoeger, 2006).

Study Limitations and Delimitations

The following delimitations should be taken into account when interpreting this study. Although the ACHA-NCHA addresses seven different content areas of health including (utilizing the exact terms from the ACHA-NCHA): (1) health education and safety; (2) alcohol, tobacco, and drugs; (3) sex behavior, perceptions and contraception; (4) weight, nutrition, and exercise; (5) mental and physical health; (6) impediments to academic performance, and; (7) demographics, this study will focus on sexual behavior, weight, nutrition, exercise, and demographics. In addition, generalizations derived from this study sample can only relate to the CSU student population.

The main limitations of this study include the lack of generalizability to the larger U.S. college student population, as the sample was drawn from CSU general education health classes alone. Another limitation was the research method. The conclusions were based on information obtained from the ACHA-NCHA questionnaire, an instrument that I did not create; therefore there, were areas that the reasearcher wanted to expand upon but was limited by the questionnaire format. For instance, the question regarding exercise only referred to “vigorous” exercise. As a result students may have answered this question with formal exercise in mind and may not have taken into account moderate exercise such as walking to and from classes or campus, chores, etcetera. Finally, the

study was limited to 18-25 year olds, eliminating several subjects from the data set. By omitting these data the overall results may have been different than if those data were included.

Significance of the Study

Much research on college students and health has been descriptive in nature or has included intervention techniques but few, if any, have specifically looked at current college student health status, preventative health practices, and perception of health. These studies have not connected exercise habits; nutrition habits; weight management habits and BMI; sexual behaviors including number of sexual partners, condom use, and vaginal intercourse to what students perceive their health status to be. This information can be useful in creating health programs for college students to help fill in the gaps between what they are doing and how it may actually be impacting their health. For example where many students identify exercise and nutrition as important components of health (Cason & Wenrich, 2002), fewer students mention sexual behavior or weight status being as important in terms of health. Therefore, some students may define their health as good because they exercise regularly, while they fail to use a condom regularly and are therefore jeopardizing their health without even realizing it.

Most studies referenced here stated that more research should be done on this population in order to combat the trend of unhealthy practices during college and beyond (Cason & Wenrich, 2002; Douglas & Collins, 1997; Pinto, Cherico, Szymanski, & Marcus, 1998; Tulloch et al., 2004). In addition, the research that looked specifically at sexual behavior and social norms theory stated that more research in this area should be conducted and or

research based education programs should be set in place on college campuses concerning sexual behavior and student perceptions (American College Health Association, 2005; Martens et al., 2006; Page et al., 2000; Scholly et al., 2005). By examining current health status, health habits, and perceptions of health this study addressed some areas where students may have been missing information when defining their health and thus may be able to contribute to campus-wide health programs in the future.

Researcher's Perspective

Interest in this topic stemmed from my work with college students at a small state college in Colorado. I teach in the Exercise and Sport Science program and interact with many undergraduate students who, I believe, should have a firm grasp on health and in particular their own health. Unfortunately, I have found that this is not always the case. It seemed that even in pursuing a degree in a health-related area, many students did not practice healthy lifestyles. I found that they did fairly well on the exercise aspect of their health but all other areas of health – or wellness as we often refer to it – were overlooked and or misunderstood. These areas of health include physical, social, emotional, mental, spiritual, occupational, and environmental. Based on these experiences with my own students, I became interested in investigating what a representative sample of students believed about their own health and how, or if, their health habits followed their beliefs. Of course the next step was to find out what the discrepancies, if any, there were between perceived health and health practices. Then, with this information, work with other health

professionals to create campus-wide health programs and resources to fill in the gaps, and hopefully, improve the health of college students at this major transition time.

College is an exciting transition period between young adulthood and adulthood. It is certainly a time when students are exposed to new information, ideas, and experiences. Unfortunately, some of these new exposures may lead students down an unhealthy path into adulthood. Health behaviors like weight gain, lack of exercise, poor nutrition, and risky sexual behaviors may be established in college and carried on into adulthood and may lead to poor health consequences like obesity, heart disease, diabetes, and STD related complications, including some cancers. It is important to come to an understanding of what is known about students' health behaviors and their relation to perceived health as well as how perceptions of others' behaviors influence student behavior.

Chapter II

Literature Review

Introduction

During college most people are exposed to a wealth of information, new ideas, and knowledge. However, despite all the information and resources available to college students many of them fall into poor health in terms of unhealthy weight gain, inactivity, and poor food choices (American College Health Association, 2005; Anding et al., 2001; Connell et al., 2005; George, 2000; Haberman & Luffey, 1998; Racette et al., 2005). The college years are also a time when many people become sexually active. It has been reported that only a minority of students use condoms when they have sexual intercourse (American College Health Association, 2005; American College Health Association, 2002; Douglas & Collins, 1997; Scholly et al., 2005; Tulloch et al., 2004). If condom use is viewed as a preventative measure against STDs (Eng & Butler, 1997), then these students are at increased risk of contracting one of these diseases or infections. The number of sexual partners college students have may also increase their risk for contracting STDs (Eng & Butler, 1997). In addition, with regard to sexual behaviors, students' perceptions of their peers' behaviors may have a negative impact on their own behaviors. Based on the social norms theory, if a person perceives that others engage in a certain behavior (the norm), whether true or not, that person is more likely to engage in such behavior as well.

Maintaining a healthy body weight, consistent exercise habits, sound nutrition habits, and STD prevention are all behaviors that can reduce one's disease risk. The following literature review will examine the background of the behaviors listed above as well as the proportions of college students who do or do not practice disease prevention lifestyle behaviors. Additionally, sexual behaviors and their relationship to social norms theory will be explored.

Overweight, Obesity, and Physical Inactivity

In the United States the prevalence of overweight, obesity, and physical inactivity has been climbing steadily over the past forty years (US Department of Health and Human Services, 2000a). Based on a 1998 estimate 97 million adults in the United States are overweight or obese (Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults: Executive summary, 1998). According to the Surgeon General's Report in 1996, over 60% of adults do not get enough physical activity to incur health benefits, and 25% of adults do not get any leisure time physical activity at all (US Department of Health and Human Services, 1996). Overweight, obesity, poor nutrition, and physical inactivity are associated with poor health and decreased quality of life. From an individual health standpoint, obesity and inactivity are associated with an increased risk of illness from high blood pressure, high cholesterol, type 2 diabetes, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances and problems breathing, and certain types of cancers. In addition, obese individuals may be subject to social stigmatization, discrimination, and lowered self-esteem (US Department of Health and Human Services, 2000a; Clinical guidelines on the

identification, evaluation and treatment of overweight and obesity in adults: Executive summary, 1998).

The issue of obesity and inactivity also can be viewed from a cost to society perspective. Two ways to measure the societal impact of obesity and inactivity are in health care costs and lost work productivity. Several studies have evaluated the economic impact of obesity and inactivity on private and government funded health care costs. The total economic impact of obesity and inactivity has been estimated at 70-99 billion U.S. dollars per year (Colditz, 1999; Finkelstein, Fiebelkorn, & Wang, 2004; US Department of Health and Human Services, 2000a). The point is not whether poor health should be addressed for financial reasons alone, but that the financial impact of these diseases is just one more indication of how severe the current health situation is in the United States today.

There is a stark shift in statistics on obesity between children and adults. Data from 1988-94 found that 11% of children and adolescents between 6 and 19 years old were overweight or obese whereas 23% of adults 20 years and older were considered obese (US Department of Health and Human Services, 2000a) and these numbers have increased in the past 13 years (current figures are in the next paragraph). Based on these figures there is a large decrease in health status that may begin during young adulthood. These figures also were seen in research that focused on rates of obesity on national, state, gender, age, and ethnicity between 1991 and 1998. Nationally, Mokdad et al. (1999) found that the rate of obesity overall increased from 12.0% to 17.9% between 1991 and 1998 and that the age group with the largest increase in obesity between 1991

and 1998 was 18 to 24 year olds (7.1% to 12.1%). They also found that the two groups with the highest level of education (some college and college completion) also had the greatest increases in obesity rates (some college 67.5% increase, and college completion 62% increase). This information suggests that education alone is not enough to combat obesity and overweight.

Nationwide, obesity and overweight rates have increased substantially since the past century. The most current obesity rate for adults is 33% (up from 23% in 1994) (National Center for Health Statistics, 2007a). Overweight or obese rates for children have increased as well to 17% in 12-19 year olds (up from 11% in 6-19 year olds in 1994), a more narrow age range than that used in 1994. Therefore, it may be assumed that these numbers would be higher if the 6-19 year old range were used today. Again, even as these numbers increase nationwide there is still a major gap between 12-19 year olds and ≥ 20 years old. The rates of obesity and overweight have increased from state to state, even in Colorado, considered to be one of the more healthy states (in terms of obesity rates) (Centers for Disease Control and Prevention, 2007b).

Colorado has one of the lowest rates of obesity at 14.0%; however, between 1991 and 1998 obesity rates increased by 66.6% (8.4% to 14.0%) (Mokdad et al., 1999). Age and education by state were not determined in this research. It can be assumed that a portion of this increase was among college students. Therefore, even though Colorado has the lowest level of obesity (current 16%, Centers for Disease Control and Prevention, 2007a), it has seen a severe increase in obesity in the past 15 years, and many of those affected may be young adults.

The trends in overweight and obesity outlined above indicate that college age and college students are at the greatest risk of obesity and that during this time something is occurring in the lifestyles of this target group that is in turn negatively impacting their health. Huang et al. (2003) in a study on overweight, obesity, diet, and physical activity in college students determined that there was a significant difference between overweight and obesity rates in students 19 years old and younger and those 20 years old and older. Students 19 years and younger had overweight and obesity rates of 19.8% and 3.7%, respectively, compared with students 20 years and older whose overweight and obesity rates were 26.7% and 8.4%, respectively.

Other researchers have investigated the freshman 15 phenomenon where students gain 15 pounds on average during their freshman year of college. Two studies found weight gain to be the norm among students in their freshman year. Racette et al. (2005) found that between the freshman and sophomore years of college 70% of the subjects in their study had gained weight and decreased their level of participation in aerobic exercise. Hoffman et al. (2006) also reported an increase in body weight in three quarters of subjects but not the predicted 15 pounds. On average those students gained seven pounds during their freshman year. While this does not sound like an alarming amount, if weight gain continued over the course of college, those students would gain close to 30 pounds, on average, by the end of their senior year. It should be noted that 27% of these students lost weight during the study indicating that not all students are at risk of weight gain. Based on these results, however, a significant proportion of students are at risk of

overweight and decreased physical inactivity which in turn may continue during their adult years.

Overweight, obesity, and physical inactivity currently are having a measurable negative impact on adults in the United States. State by state the obesity rates continue to increase and diseases associated with obesity and physical inactivity, such as diabetes, affect more and more people. Based on the literature and government statistics referred to above, the pivotal time at which the risk of overweight, obesity, and physical inactivity increases appears to be in college aged adults. For instance, Healthy Campus 2010 reported 66.8% of college students were at a healthy target weight (based on BMI 18.5-24.9 kg/m²) whereas 29.5% were overweight or obese (BMI > 25 kg/m²) (American College Health Association, 2002). These numbers are nearly opposite the data for adults in the US (66% overweight or obese, 34% healthy weight) (National Center for Health Statistics, 2007a). Unfortunately, there is not a notable trend of decreases in weight and increases in physical activity after college; therefore, the physical changes and physical activity habits that occur during college seem to take hold and last throughout adulthood. Increases in overweight and obesity do not occur in and of themselves. Two factors that have a negative effect on body weight are poor nutrition practices and lack of regular physical exercise.

Exercise and Nutrition

Several studies that examined weight, exercise, and nutrition habits found that most college students are not getting enough physical activity to reap health benefits, or they are not physically active at all. In addition these students are not eating a variety of

health enhancing foods each day. With respect to weight, some of these studies found that students' perceptions of their weight, whether healthy or unhealthy, did not match reality.

A number of studies in this report had similar findings to the 1996 Surgeon General's Report that stated a minority of students got the recommended amount of physical activity. The general recommendation for physical activity is 30 minutes of moderate, or 20 minutes of vigorous physical activity three to five days per week (ACSM, 2006). Haberman and Luffey (1998) discovered that only 39% of students exercised at least three times per week, and 12.3% did not exercise at all. George (2000) found similar results in her study of physical activity in college students in that 32% of men and 22% of women reported exercising for at least 30 minutes at a moderate intensity five or more days per week. Anding et al. (2001) also determined that only one third of students exercised regularly. In contrast Connell et al. (2005) found that one third of students at the University they studied achieved no aerobic activity at all. They did not state, however, the number of students who did meet the recommended amount of exercise. The only reports here that found a number higher than one third were the American College Health Association's 2003 report of 33 campuses and nearly 20,000 students, (Douglas & Collins, 1997; Pinto, et al., 1998) (these studies will be discussed below). In the American College Health Association study they determined that 44.2% of students exercised for at least 30 minutes at a moderate intensity or 20 minutes at a high intensity at least three of the last seven days. Douglas and Collins (1997) found that 37.6% met the recommendation of vigorous physical activity for at least 20 minutes on at

least three of the last seven days; only 19.5%, however, reported exercising at a moderate intensity for 30 minutes on five of the past seven days.

These studies clearly illustrate that by and large a minority of students achieve the recommended amount of exercise per week. Some of these studies also showed a discrepancy between males and females and exercise. Huang et al. (2003) determined that 16.1% of college students did not exercise at all, and when this was broken down by gender, similar to George's (2000) findings, more females than males did not exercise (21.5% versus 11.0%). They also found that the proportion of non exercising females increased with age (≤ 19 years old 13.9% no exercise, ≥ 20 years old 22.1% no exercise). This indicates that females at all ages are less active than males, and that students get less physical activity the older they get. Huang et al. also found that, on average, students exercised 2.8 ± 2.1 days per week. Remembering that the recommended amount of exercise is 3-5 days per week this suggests that these students are not meeting the low end of the recommended amount of exercise per week. Pinto et al. (1998) also examined change in exercise habits during college by studying the same group of students from their first to second year of college. While they found no significant differences in minutes of exercise per week between years, and 58% of students met the recommended amounts of exercise per week, 42% of students were considered sedentary. This study's results were the most optimistic with a majority of students reaching the recommended amount of exercise per week.

The literature illustrates a range of figures with regard to exercise participation in college students. From the literature above the range of students who meet the

recommended amount of exercise per week is somewhere from one third to almost two thirds of students. In 1996 the Surgeon General reported that 25% of adults got no exercise or physical activity at all. The studies here reported numbers lower than 25% suggesting that the picture gets even more bleak with regard to exercise after college and into adulthood and that perhaps the low exercise habits established during college for some people carry on and worsen in adulthood.

These studies also reported on nutrition habits. Most students were not getting the recommended five servings per day of fruits and vegetables (American College Health Association, 2005; Anding et al., 2001; Cason & Wenrich, 2002; Connell et al., 2005; Douglas & Collins, 1997; Haberman & Luffey, 1998; Huang et al., 2003). The percentage of students who got the recommended amount of fruits and vegetables per day ranged from 2% to 30.6% (American College Health Association, 2005; Anding et al., 2001; Cason & Wenrich, 2002; Douglas & Collins, 1997; Huang et al., 2003).

Cason and Wenrich (2002) used a mixed-method study to assess college students' attitudes and beliefs with regard to their own health. They had 94 total respondents and 36 students in focus groups. From the survey only 2% ate the recommended amount of fruits per day, and only 4% ate the recommended number of vegetables per day. All of the focus groups in this study stated that they believed nutrition and exercise were important for a healthy lifestyle but that eating right was difficult due to the cafeteria choices and the cost of food. They also indicated that these were issues that they would worry about when they were older.

All of the studies cited above were performed when the recommendations for fruits and vegetables were lower than they are today. The previous recommendation, combined at least five servings of fruits and vegetables per day (2-3 servings fruit, and 3-4 servings vegetables). Today the recommendation is two cups of fruit (4 servings) and two and a half cups of vegetables (5 servings) per day (US Department of Health and Human Services, 2005). With this in mind, it seems likely that students will fall even further behind with regard to eating a diet that is believed to enhance health and reduce risk for disease.

Weight Management

In several of these reports it was interesting to note that student perceptions of their weight and health and their true weight and health differed. Haberman and Luffey (1998) found that only 8% of students were classified as overweight, but over 50% of those who were classified as underweight considered themselves overweight. Volicer et al. (2003) discovered that 25.8% of the students they surveyed were overweight, but 75% considered themselves overweight. In contrast Connell et al. (2005) found that only 6% of students classified themselves as very overweight whereas 15% were obese according to National Institute for Health guidelines for obesity. Data from the ACHA 2003 report also found inconsistencies between students' reported weight classifications and their classifications based on BMI. They found that 4.9% were underweight (BMI < 18.5 kg/m²), but 10.9% reported that they were slightly or very underweight, 65.3% were at a healthy weight (BMI 18.5 to 24.9 kg/m²) versus 52.8% who reported they were at the right weight, 20.9% were overweight (BMI 25-29.9 kg/m²) but 32.6% reported they were

overweight, and 9.0% were obese ($>30 \text{ kg/m}^2$) against just 3.6% who reported they were very overweight. From these data more students thought they were underweight than actually were, fewer thought they were at a healthy weight than actually were, more thought they were overweight than actually were, and fewer thought they were obese than actually were. Additionally, Douglas and Collins (1997) found that 20.5% of students were considered overweight but that 30.8% dieted to lose weight. Their study did not indicate if those who dieted were in the overweight group or if this figure came from other students, some of whom, based on the findings above, may have been healthy body weight or even underweight.

There seem to be discrepancies between students' perceptions of their body weight and health versus their true body weight and health status. The literature has shown that students may not be perceiving themselves realistically, either seeing themselves as heavier or thinner than they really are. These misperceptions may in turn lead to unhealthy and unrealistic dieting practices. Additionally, when taken with the information on college student exercise and nutrition habits, students trying to lose or maintain their weight may or may not be doing so in a healthy manner.

Sexual Behavior

Sexually transmitted diseases represent five of the 10 most frequently reported diseases in the United States (Eng & Butler, 1997). According to the executive summary by the National Academy of Sciences published in 1997, each year there are approximately 12 million new cases of STDs; of these three million are in teenagers. This study also reported that the annual health care costs associated with STDs is

approximately 10 billion dollars. One area that is of particular concern is the disproportionate number of women who are affected by STDs. Women are more susceptible to STDs because their biology lends to greater rate of transmission. In addition, women may be asymptomatic and therefore at higher risk of complications due to STDs than men. Some of the side effects that impact women include infertility, ectopic pregnancy, and chronic pelvic pain (Eng & Butler, 1997). Also, because women may not have symptoms of an STD, they are more likely to pass an STD on to their sexual partners. Two factors that may increase risk for STD transmission in men and women are condom use and number of sexual partners.

The areas of sexual behavior that will be examined here include condom use as well as the number of sexual partners in the past year in sexually active college students. Condoms are a proven method of protection against STDs (Eng & Butler, 1997). Failing to use condoms is thus associated with increased risk of contracting STDs (Eng & Butler, 1997). As the number of sexual partners increases so does risk of transmitting an STD (Eng & Butler, 1997). According to data from the ACHA-NCHA, a 300 question survey of health habits of college students, from 2000 (N = 16,024, 28 higher education institutions) almost 1% of male and female college students had *Chlamydia trachomatis* infections, 367 per 100,000 students had gonorrhea, 1% had been diagnosed with genital herpes, 1.4% had human papillomavirus infection, and 1.4% of women were treated for pelvic inflammatory disease (American College Health Association, 2002) These data were self-reported. It is important to keep in mind that many people have these diseases

but do not present symptoms and therefore may be passing them on unknowingly and or reporting inaccurate information.

Condom Use

Multiple studies have found that only a minority of college students used condoms every time or even “the last time” they had vaginal intercourse (American College Health Association, Healthy Campus 2010, 2002; American College Health Association, 2005; Douglas & Collins, 1997; Scholly et al., 2005; Tulloch et al., 2004). According to data from ACHA-NCHA from 2000 only 31.2% of females and 44% of males used condoms at their last vaginal intercourse. Data from the 2003 ACHA-NCHA indicated that 35.3% used condoms for contraception the last time they had sexual intercourse, and 48.6% used condoms the last time they had sexual intercourse. This indicates that of students who used condoms approximately 13% used them for protection against sexually transmitted diseases or infections. Tulloch et al. (2004) found that students reported using condoms 30% of the time that they had heterosexual intercourse. In this study they also determined that there was a negative correlation between condom use and length of relationship. Again these students surveyed may be using other methods of contraception as they do not perceive that they are at risk of passing a sexually transmitted disease or infection because they are in a relationship. Scholly et al. (2005) asked how many students always or never used condoms when they had vaginal intercourse. They found that 40% of students never used condoms, and 40% indicated that they always used condoms. Perhaps the most striking statistics came from Buunk,

Van Den Eunden, and Siero (2002) where 77% of students reported not always using a condom.

Social Norms Theory

Social norms theory is based on the notion that people's perceptions, whether correct or not, of others' behavior may determine their own behavior. Social norms theory was formally introduced in 1986 by Berkowitz and Perkins although the idea of social norms existed before this under different titles (Chia & Gunther, 2006). Berkowitz (2004) compiles an annotated bibliography of social norms theory research every few years, and by far the largest body of research on social norms theory has been dedicated to alcohol use in college and high school students. Other areas of study include smoking prevention, reducing driving while under the influence, and sexual assault to name a few. There has been limited research on social norms theory and sexual behaviors in college students.

There are multiple definitions and subtheories within social norms theory. The "gap between 'perceived' and 'actual' is referred to as a 'misperception', and its effects provide the basis for social norms approach" (Berkowitz, 2004, p. 5). In addition, there are several types of misperceptions. Pluralistic ignorance has been described in various ways. Essentially pluralistic ignorance is where the majority believes there is a difference between them and others in how they behave and think when in actuality there is not (Allport, 1924, in Chia & Gunther, 2006; Berkowitz, 2004). Other types of misperceptions include false consensus where a minority believes their behavior is the norm when in fact it is not. Finally, false uniqueness entails individuals believing they are

more unique than they are (Berkowitz, 2004). Social norms theory also describes two types of norms: injunctive and descriptive. An injunctive norm is an attitude or feeling based on morals or beliefs. A descriptive norm has to do with behavior or what people do (Berkowitz, 2004). In terms of social norms theory and sexual behavior in college students, all types of misperceptions as well as norms may be engaged.

Several authors have examined sexual behavior in college students using the social norms theory (American College Health Association, 2005; Buunk et al. 2002; Chia & Gunther 2006; Martens et al., 2006; Page et al., 2000; Scholly et al., 2005). Scholly et al. (2005) asserted “Social norms theory states that behavior is often influenced by how individuals perceive that other members of a social group behave, and that beliefs regarding this practice are often incorrect” (Scholly et al. 2005, p. 160). According to Martens et al. (2006) when students perceive others are engaging in particular behaviors more than they are, students are more likely to engage in such behaviors themselves.

Social Norms Theory – Number of Sexual Partners

The research that examined number of sexual partners in the past year based on the social norms theory found without exception, that the actual number of partners in the past year was much lower than the perceived number of partners. In Martens’ et al. (2006) investigation of number of sexual partners in the past year, using social norms theory, they found a disparity between the actual number of reported sexual partners per year and the perceived number of sexual partners of student peers in the past year. The actual mean number of partners was 2.55, and the mean perceived partners was 4.79. The

ACHA-NCHA 2003 Reference Group showed that 74.7% of students reported having 0-1 sexual partners in the past year, but only 14.3% of students surveyed thought that other students limited their sexual partners to 0-1 per year (American College Health Association, 2005). Scholly et al. (2005) also looked at number of sexual partners. They found students overestimated the number of sexual partners in others. For example, 80% reported 0-1 partners in the past year, but only 22% of students perceived that others limited their number of partners to 0-1. Page et al. (2000) examined perceptions of peer behavior but separated out perceptions of what they called engagers (in sex and at least four sexual partners in their lifetime) versus non-engagers. They determined that those students who reported more sexual partners in their lifetime also predicted that their peers had higher numbers of sexual partners in their lifetime when in fact most students had fewer than four sexual partners in their lifetime. Overall, 28.9% of females and 30.1% of males reported four or more sex partners in their lifetime. The mean perception by engagers was that 44.6% of females and 53.3% males had had four or more sexual partners in their lifetime.

There are many implications of this research. Based on social norms theory if students perceive that their peers have had several sexual partners per year, or in their lifetime, they may be more likely to follow this behavior because they believe it to be the norm. The greater the number of sexual partners that a person has the more exposure one also has to STDs.

Some of the studies mentioned above also looked at sexual intercourse over the past month in sexually active students. Martens et al. (2006) reported the number of times

students engaged in vaginal intercourse in the past 30 days and what the perceptions were about this number. The authors discovered that sexually active students reported having vaginal intercourse 3-4 times in the past 30 days, whereas the same sample perceived that the average sexually active student engaged in vaginal intercourse 5-6 times in past 30 days. The ACHA-NCHA 2003 Reference Group also looked at students perceptions of sexual behaviors in others and found that whereas only 49.1% of students reported having vaginal intercourse one or more times in the last 30 days, 96.8% believed that the average student had vaginal intercourse in the past month (American College Health Association, 2005). Page et al. (2000) found similar, though not as striking, results to the ACHA-NCHA study. In their work they determined that while a relative minority of students, 42.9% of males, and 49.7% of females had had sex in the past month, the mean perception was 60.1% for males and 54.6% for females. Chia and Gunther (2006) also examined students' perceptions of their peers compared with themselves. They found that there was a discrepancy between actual sexual permissiveness (having sex on a first date, or early in a relationship, or casually) and perceived sexual permissiveness. Most, 69.5%, of students said they were not comfortable having sex on the first date, but only 22% perceived that their peers were conservative on this aspect as well. They also found that based on the projection effect (or "false consensus" from Berkowitz, 2004) if a student was sexually permissive, he or she also believed his or her peers were. The ramifications of these thought processes may be that if one believes that his or her peers are likely to have sex on the first date he or she may feel a certain pressure to do the same and by doing so may be putting him or herself at risk of an STD.

Social norms theory may not only play a role in frequency of sex, but also in safe sex practices. Based on the findings regarding unprotected sex, that a minority of students are using condoms for instance, these students may also engage in sexual intercourse without a condom because they perceive that others are doing so. In addition, the low number of students using condoms, or using condoms every time they have sex, may imply that students who are sexually active may be using birth control pills, or another method of contraception, as they are less concerned with sexually transmitted diseases and more concerned with preventing pregnancy. To take this one step further, based on the information on the number of people infected with an STD without their knowledge, students not using condoms because they think they are free of disease, (or their partner is) or they have a different form of birth control, may be passing on (or contracting) an STD and not know it.

Conclusions

The literature has shown that in many cases college students are not following sound health practices in terms of body weight, exercise, nutrition, and sexual behaviors. In addition, there is some research that has connected sexual behavior choices to the social norms theory, implying that students' perceptions of their peers engaging in risky sexual behavior makes it more likely that they will engage in these behaviors themselves. One important aspect of this discussion is students' perceptions of their own health and answering whether or not their behaviors correlate accurately to their perceptions or whether students weigh one or more behaviors more heavily when defining their health. Another interest point of this discussion is attempting to understand what the effect of

peer perception of behavior is on individual behaviors. While there is much research pertaining to alcohol and social norms there is less on sexual behavior and social norms. Therefore, the three main components of this study include the relationship between exercise, nutrition, and weight management and perceived health; sexual behavior and perceived health; and social norms theory and sexual behavior. The aim of this study was to shed light on what behaviors students are using to define their health and how the perceived sexual behavior of others impacts individual students' sexual behaviors.

Chapter III

Methods

Overview of Study

The purpose of this quantitative, non-experimental survey research study was to examine the relationships between female and male college students' health behaviors and their perceived health. The specific behaviors that were studied include exercise, nutrition, weight management, weight status via body mass index (BMI), condom use, number of sexual partners, and vaginal intercourse. These variables were examined from the following perspectives: as preventative practices from chronic diseases including: obesity, heart disease, and diabetes as well as sexually transmitted diseases. A secondary purpose was to look at how students perceived their peers' sexual behaviors and if this influenced their own behavior based on the social norms theory.

Research Design and Rational

This research took a quantitative, non-experimental, survey approach. The instrument that was used was the American College Health Association National College Health Assessment (ACHA-NCHA). The ACHA-NCHA was developed in 1998 to assess health behaviors and perceptions in college students. The instrument consists of seven content areas including: (1) health education and safety; (2) alcohol, tobacco, and drugs; (3) sex behavior, perceptions and contraception; (4) weight, nutrition, and

exercise; (5) mental and physical health; (6) impediments to academic performance, and; (7) demographics. Each content area contains one to eleven questions which are divided into sub-questions for a total of 300 questions. The types of responses to questions include numerical/categorical responses (e.g., age), dichotomous such as yes/no, and frequency of behavior. Colorado State University utilized this instrument to collect one-time information from participants (approximately 3000) over the course of three years from the larger CSU undergraduate student population.

The specific research approach was chosen for several reasons. This section will outline this rationale as follows: purpose of survey research and potential error in survey research; limitations of survey research; and strengths of survey research. In each of these sections the research study will be discussed specifically.

Purpose of Survey Research and Potential Error in Survey Research

In this study the purpose of using the survey research approach was to generalize from a CSU sample to the CSU undergraduate population as a whole in order to investigate relationships between health attitudes and behaviors of college health within this population (Babbie, 2004; Creswell, 2003; Gliner & Morgan, 2000).

Because a sample is used to infer (or in this case determine if relationships exist) to a whole population there are several sources of error that must be considered when designing survey research. Four potential sources of error include coverage error, sampling error, measurement error, and non-response error (Salant & Dillman, 1994).

Coverage error relates to how random the sample is. This study's sample can be said to be representative but not truly random. Gliner and Morgan (2000) discuss

sampling starting from the population and narrowing to the sample. This begins with the theoretical or target population which was college students at CSU. The accessible population was CSU students in required All-University core health classes. This convenience sample was also the selected sample (the actual sample taken from the accessible population). The sample population was assumed to be a representative sample of the target population because all undergraduate students at CSU were required to enroll in one of a list of designated health education health classes during their course of the study. Because this survey was distributed in four of the five general education health classes, it may be assumed that the students (nearly 3000) represent the larger CSU student body as a whole.

Sampling error occurs when a sample size is not large enough to achieve precision. The sample for this study was approximately three thousand students, minimizing sampling error. Measurement error occurs when the instrument and questions used are not reliable. Please see below for a discussion of reliability and validity of the instrument and sample. Non-response error occurs when the sample chosen does not respond to the survey. Because the survey was administered during class time, the non-response error was minimized.

The largest source of error in this design may be the coverage error. However, because this was a study specific to CSU students, the fact that this was not truly random does not affect the ability to infer to the CSU population from the representative sample.

Limitations of survey research

There are limitations, or weaknesses, of the survey design as there are for any design (Babbie, 1990). Babbie (2004) outlines several weaknesses that are present in survey research. The first is the use of standardized questions. Here he states that “by designing questions that will be at least minimally appropriate to all respondents, you may miss what is most appropriate to many respondents” (p. 275). Other weaknesses of surveys include lack of context of social life; inflexibility (this was addressed in the limitations section of this proposal); inability to measure social action; and weakness on validity (but strong on reliability, these issues are addressed in the section on reliability and validity). Babbie (2004) states that the artificial nature of survey design is what leads to reduced validity.

Strengths of Survey Research

There are several strengths to survey research that made it a logical choice for this study including high response rate, cost effectiveness, economy of design, rapid turnover in data collection, and flexibility. Gliner and Morgan (2000) state that “The main advantage of directly administered (i.e., not mailed) questionnaires is that a high response rate is usually obtained, especially if the participants are expected to be in that location anyway” (p. 339). This is certainly a benefit of this study as the respondents were general education health class students who took the survey during class time. In this case a large number of students were able to fill out the survey at one time to obtain nearly one thousand subjects per school year over three years. Gliner and Morgan also note that

survey research is cost effective. In this study the administrators of the survey were course instructors; therefore, they were not paid extra for their time.

Creswell (2003) mentions the advantages to survey research as being economy of design and rapid turnover in data collection. The economy of design was seen in that the questionnaires were administered just one time to each of the subjects in just 20 minutes. In addition, the questionnaires, after completion, were returned directly to ACHA for entry into SPSS.

Babbie (2004) echoes some of the advantages stated above. He maintains that self-administered surveys (as this one was) make it possible to survey a large sample. Surveys are also flexible in that one can ask a multitude of questions on one topic, or several topics. In the case of the ACHA-NCHA the survey asks 300 total questions, derived from 51 main questions and seven areas of health. In this study three of the seven areas of health were examined for a total of 15 (of the 51 main questions) questions.

Participants and Site

The participants study were female and male students from CSU's approximate student population of 25,000. These students were enrolled in one of four (of the five) general education health classes at CSU. Because all CSU students were required to take a general education health course during their college career at CSU, it was believed that the students completing the questionnaire were representative of the CSU student population in gender, age, and race. It was not assumed that these students were representative of all college students nationwide.

There was no age requirement for the ACHA-NCHA; it was assumed that the majority of students were between 18 and 25 years of age, while some subjects may have been non-traditional college students and thus potentially quite a bit older than those in the typical college student age bracket. For this study, however, students that fell outside the 18-25 year range were omitted from the data.

There were 2890 subjects total. Each year, beginning in 2003, this survey was administered to approximately 1000 CSU students. Data were taken from the last three years of collection (specific data collection techniques will be described below). During evaluation of the data, the researcher examined whether or not this sample truly matched the student demographics of the University as a whole. This information aided in understanding the level of generalizability to the University student population, and whether the results can be generalized to the University student population, or just portions of it. This issue will be discussed in Chapter five.

Data Collection

The data that were used in this study were archival in nature. The ACHA-NCHA has been administered to general education health classes at CSU since the 2003/2004 school year; the 2006/2007 school year was the fourth, and final, round of data collection. This study used data from the 2004/2005, 2005/2006, and 2006/2007 school years because all of these data were collected in the spring semester. The data from 2003/2004 were collected in the fall semester and were therefore omitted. The reasons for this were: (1) the ACHA-NCHA asks questions that relate to the last year; thus, if there were freshmen in these courses, they would be answering questions based on high school; and

(2) using data from the spring semesters alone reduces any confounding factors that may arise from data collected in the fall versus the spring. Students in these health classes were given the option to participate in the study during class time. They were made aware that their participation, or lack thereof, would not have an impact on their grade for the course. The assessment took approximately 20 minutes. The investigator was the CSU course instructor at the time the data were collected. The co-investigator, another CSU professor, administered the assessment to ensure confidentiality in participation. All data, once collected, were entered into SPSS for analysis.

Measures

The ACHA-NCHA was developed in 1998 by an ACHA panel to assess health areas in college students. The questionnaire consists of seven content areas and 300 total questions. The content areas include: (1) health education and safety; (2) alcohol, tobacco, and drugs; (3) sex behavior, perceptions and contraception; (4) weight, nutrition, and exercise; (5) mental and physical health; (6) impediments to academic performance; and (7) demographics. In 2000 ACHA performed research and instrument validity and reliability testing by comparing a large data set from NCHA to five other national databases on health assessment including three ACHA-NCHA pilot studies. The results showed that the NCHA was reliable and valid. A more detailed discussion of the methods and results of this analysis follow.

In Spring 2000, there were 35 institutions of higher education that self-selected to participate in the ACHA National College Health Assessment. Of these 35 schools 28 qualified to participate based on random sampling of students, a criterion of ACHA. The

data that were collected on 16,024 students were used to conduct reliability and validity tests on the NCHA instrument. In this study they investigated item reliability, construct validity, and measurement validity. Item reliability analysis helps determine the reliability of a range or sequence of questions related to the same subject area. Construct validity analysis looks for reproducibility; if two or more tests show replication then the measurement is said to be valid and increases confidence in findings. Measurement validity is the grade of fit between a construct and its markers (National College Health Assessment ACHA-NCHA Reliability and Validity Measures, 2004, p. 2-3). To test these measures ACHA compared their results to those of several other national databases on health. These databases included: the National College Health Risk Behavior Survey 1995 (NCHRBS); the Harvard School of Public Health 1999 College Alcohol Study (CAS); The United States Department of Justice: The National College Women Sexual Victimization Study 2000 (NCWSV); the National College Health Assessment 1998, Spring 1999, and Fall 1999 Pilots; and the National College Health Assessment (NCHA) Spring 2000. To determine item reliability they used Chronbach's alpha (range 0-1). They found overall a similar pattern of alpha coefficients across the data. To determine construct validity they used the Pearson's correlation coefficient (range -1 to +1). Again a similar pattern was seen across the compared data sets. Measurement validity was analyzed using Logistic Regression where the main coefficient was the odds ratio. In this analysis as well the pattern of results from NCHA was similar to that of CAS, a nationally generalizable database (National College Health Assessment ACHA-NCHA Reliability and Validity Measures, 2004).

Internal Validity: based on the criteria questions from Morgan, Gliner, and Harmon (2006): was there random assignment of participants? Was there high retention during the study? Was the study conducted in a controlled environment? And were extraneous variables controlled for? This study can be said to be low-medium on internal validity. This study is non-experimental associational where there was only one test group, (i.e., no control group). The participants completing the questionnaire were representative (not random) in that they came from general education health classes at CSU. Because all students at CSU must take a health class to graduate, it can be assumed that the students that took the NCHA were a representative sample of the students at CSU. Retention was not an issue because students were given the option to participate or not just one time. There were no repeated measures. Students completed the questionnaire in the health course classroom; therefore, the participants were accustomed to the environment. Because there was no treatment there were no extraneous variables to control for. It could be said that extraneous variables such as generation, history, and student living environment may have had an impact on their responses. These variables will be addressed in the discussion of the results. Due to this last issue as well as the sample being considered representative but not random, this study can be considered to be of low-medium on internal validity (Gliner & Morgan, 2000).

External Validity: It should be noted that because schools participating in the NCHA are self-selected the information obtained from these data cannot be generalized to the national population of college students. However, because the students at each institution are representative of the student body, the information provided from the

survey can be applied to the school in question. Further, because a primary purpose of the instrument is to provide data to in turn implement health programs at each particular institution, national generalizability is not necessarily a goal of the participating colleges or ACHA.

Due to the explanations above, the quantitative, non-experimental, survey design is a sound methodology to address the research questions proposed. The sample size is large (roughly $n = 3000$); therefore, a questionnaire is a cost and time effective mode to reach that number of students. The ACHA-NCHA provides the specific items that pertain to the research questions in this study, including social norms and sexual behavior questions. In addition, the questions on the ACHA-NCHA lend themselves to be coded and entered into SPSS for analysis. Finally, the researcher wished to examine health beliefs and behaviors at one point in time, eliminating the need for an experimental design.

Data Analysis

The data were analyzed descriptively as well as inferentially. The ten descriptive variables included: total number of participants, gender, age, perceived health, exercise, nutrition, weight management, weight status (BMI), condom use, number of sexual partners in the past year, and frequency of vaginal intercourse in the past month. The descriptive statistics that were used to analyze these variables included: mean; standard deviation; and frequency distribution. See Table 3.1, Appendix B for the research question and item on the survey that correspond to each descriptive variable.

There were three main areas of research questions that were expanded into a total of ten research questions. Each area is described and then the analysis method for each question in that area will be explained. All three areas were first analyzed via the descriptive statistics: N, mean, and standard deviation.

Area one: What is the relationship between students' perceived health and preventative health practices related to exercise, nutrition, and weight management in female and male college students? There were four sub-questions in area one. Question 1a was: What is the relationship between perceived health and number of exercise sessions in the last seven days? The independent variable was exercise, and the dependent variable was perceived health. A Pearson's product-moment correlation coefficient, r (Pearson's r) was used because both the independent and dependent variables were normally distributed and contained five or more levels (Morgan, Leech, Gloeckner, & Barrett, 2004; Morgan, et al., 2006).

Question 1b: What is the relationship between perceived health and meeting, or not meeting, the recommended five servings of fruits and vegetables per day? The independent variable was nutrition, and the dependent variable was perceived health. A Spearman ρ was used because the data was skewed (Morgan et al., 2004; Morgan et al., 2006).

Question 1c: What is the relationship between perceived health and weight maintenance or weight loss? The independent variable was weight management, and the dependent variable was perceived health. A Pearson's r was used because both the

independent and dependent variables were normally distributed and contained five or more levels (Morgan et al., 2004; Morgan et al., 2006).

Question 1d: What is the relationship between perceived health and weight status (via BMI)? A Spearman ρ was used because the data were skewed (Morgan et al., 2004; Morgan et al., 2006).

Each question in area one was investigated using the total sample, females, and males. In addition, the mean differences for females and males were investigated to see if there were significant differences between these two groups. ANOVAs were used as a parametric statistic and Mann-Whitney U was used as a non parametric statistic for BMI because the data were skewed.

Area two: What is the relationship between perceived health and preventative health practices related to condom use, number of sexual partners, and vaginal intercourse frequency in females and males? There were three sub-questions in area two.

Question 2a: What is the relationship between perceived health and condom use? The independent variable was condom use, and the dependent variable was perceived health. There were two items on the survey pertaining to condom use used to answer this question. The first item, question 25, had seven levels, and the dependent variable had five levels so Pearson's r was used. Even though the second item, question 27, had four levels a Pearson's r was used (Morgan et al., 2004; Morgan et al., 2006).

Question 2b: What is the relationship between perceived health and number of sexual partners in the past year? The independent variable was number of sexual partners in the past year, and the dependent variable was perceived health. A Spearman ρ was

used because number of sexual partners data were continuous and skewed, and perceived health had five or more levels (Morgan et al., 2004; Morgan et al., 2006; Pallant, 2007).

Question 2c: What is the relationship between perceived health and vaginal intercourse frequency? Pearson's r was used because both variables were normally distributed and had more than five levels (Morgan et al., 2004; Morgan et al., 2006). Each question in area two was investigated using the total sample, females, and males. In addition, the mean differences for females and males were investigated to see if there were significant differences between these two groups. ANOVAs were used as a parametric statistic and Mann-Whitney U was used as a non parametric statistic for number of sexual partners in the past year because the data were skewed.

Area three addressed social norms theory and sexual behavior. The main question was: What is the correlation between perception of peer sexual behavior and individual sexual behavior in female and male college students? Area three was broken down into three sub-questions.

Question 3a: Is there a correlation between students' perception of frequency of peer condom use and their own frequency of condom use in the past month? The independent variable was perception of peer condom use, and the dependent variable was individual condom use in the past 30 days. Spearman ρ was used because both variables were skewed and had more than five levels (Morgan et al., 2004; Morgan et al., 2006; Pallant, 2007).

Question 3b: Is there a correlation between how many sexual partners students perceive the typical student has had in the past year and how many sexual partners they

have had in the past year? Spearman *rho* was used because the data was skewed, and both variables were continuous (i.e., had more than five levels) (Morgan et al., 2004; Morgan et al., 2006; Pallant, 2007).

Question 3c: Is there a correlation between students' perception of frequency of peer vaginal intercourse in the past month and frequency of their own vaginal intercourse in the past month? A Pearson's *r* was used because both variables were normally distributed and had more than five levels (Morgan et al., 2004; Morgan et al., 2006).

Each question in area three was investigated using the total sample, females, and males. In addition, the mean differences for females and males were investigated to see if there were significant differences between these two groups. ANOVAs were used as a parametric statistic and Mann-Whitney *U* was used as a non parametric statistic for condom use and number of sexual partners in the past year because the data were skewed (partners both sample and typical student and condom use typical student).

Morgan et al. (2006) state that large samples may yield correlation coefficients that are significant, but they may in fact be inconsequential; therefore, confidence intervals should be used. The results of correlation coefficients may be reported as a confidence interval which "delineates the magnitude and the error of estimation of *r* and is computed using the same information needed to determine statistical significance" (p. 198). Therefore, confidence intervals were used in conjunction with correlation coefficients for all questions in areas one through three.

Summary

The purpose of this quantitative, non-experimental, survey research study was to examine the relationships between female and male college students' health behaviors and their perceived health. This method allowed for a large sample from the CSU student population to be surveyed within a short amount of time in order to make inferences about the larger CSU student population. In addition, the questionnaire format of the ACHA-NCHA provided easily coded questions for thorough statistical analysis.

College is a time when responsibility for one's health increases as most people are living on their own for the first time. The literature shows that there are decreases in health enhancing behaviors during the college years (Huang et al., 2003; Mokdad et al., 1999). Other statistics signify that as people enter adulthood the incidence of overweight and obesity increase dramatically from childhood (National Center for Health Statistics, 2007a; US Department of Health and Human Services, 2000).

There are several components of health that can be used in defining and maintaining one's health. This study focused on three main areas: (1) exercise, nutrition, and weight management; (2) sexual behavior; and (3) social norms theory and sexual behavior. Exercise, nutrition, and body weight are typical ways to measure health and health behavior. Sexual behaviors, specifically protective behaviors such as condom use and limiting number of sexual partners, are less often referred to when defining health. In addition, there is evidence that how one perceives others to behave may influence how he or she behaves. Social norms theory has been used extensively in researching alcohol use in college students but less so in sexual behavior in this population (Berkowitz, 2004).

The aim of this study was to examine how students perceive their own health and to evaluate where they fell based on the recommendations for exercise, nutrition, and weight management practices. This study also investigated sexual practices such as condom use, number of sexual partners, and vaginal intercourse frequency from several standpoints: descriptive; in relation to perceived health; and in relation to perceptions of peers' sexual behaviors using the social norms theory. Finally, this study attempted to establish if there were one or more health behavior(s) that was integral in shaping students' self-assessed health. Determining what students do and believe about themselves with regards to their health can aid in developing health and social programs for college students on the CSU campus.

Chapter IV

Results

The purpose of this study was to examine Colorado State University (CSU) students' exercise, nutrition, weight management, and sexual behaviors that may enhance disease prevention and those behaviors' relationship to students' perceived health. A secondary purpose of this research was to examine how students' perceptions of their peers' sexual behaviors influence their own sexual behaviors based on social norms theory. The instrument that was used to test these questions was the American College Health Association – National College Health Assessment (ACHA-NCHA), see appendix A. The specific independent variables that were investigated include: body mass index (BMI) classification, weight management, exercise frequency, nutrition practices, condom use, number of sexual partners in the past year, and frequency of vaginal intercourse in the past month. Body mass index was used as an indicator of current health status. The dependent variable was defined as student perceived health. Additionally, the sexual behaviors (i.e., condom use, number of sexual partners, and vaginal intercourse) were examined using the social norms theory as well as correlating these variables to the dependent variable.

The research questions addressed the following areas: (1) exercise, nutrition, and weight management; (2) sexual behavior; and (3) social norms theory and sexual behavior.

Area one: What is the relationship between students' perceived health and preventative health practices related to exercise, nutrition, and weight management in females and males? Area one was broken down into four sub-questions:

1a) What is the relationship between perceived health and number of exercise sessions in the last seven days?

1b) What is the relationship between perceived health and meeting, or not meeting, the recommended five servings of fruits and vegetables per day?

1c) What is the relationship between perceived health and weight maintenance or weight loss?

1d) What is the relationship between perceived health and BMI?

Area two: What is the relationship between perceived health and preventative health practices related to condom use, number of sexual partners, and vaginal intercourse in female and male college students? Area two was broken down into three sub-questions:

2a) What is the relationship between perceived health and condom use?

2b) What is the relationship between perceived health and number of sexual partners in the past year?

2c) What is the relationship between perceived health and vaginal intercourse frequency?

Area three: Social norms theory and sexual behavior. What is the correlation between perception of peer sexual behavior and individual sexual behavior in female and male college students? Area three was broken down into three questions:

3a) Is there a correlation between students' perception of frequency of peer condom use and their own frequency of condom use in the past month?

3b) Is there a correlation between how many sexual partners students perceive the typical student has had in the past year and how many sexual partners they have had in the past year?

3c) Is there a correlation between students' perception of frequency of peer vaginal intercourse in the past month and frequency of their own vaginal intercourse in the past month?

The NCHA-ACHA was distributed in four of the five general education health classes at CSU in the fall semester of 2003 and the spring semesters of 2005, 2006, and 2007. The 2003 data was omitted from this study because some questions in the questionnaire related to the last year of life, and freshmen taking the survey may therefore have referred to behavior in high school. In addition it was desirable to be consistent between all data sets, thus only data from spring semesters was examined. Each semester approximately 1000 students participated in the study. The total sample consisted of 3082 students. When the sample was limited to college students between 18 and 25 years old there were 2890 respondents. Females made up 52.8% of respondents. The races of participants were as follows ($n = 2767$), 86.7% white, 2.3% African

American, 7.1% Hispanic, 3.3% Asian, 0.8% Indian, and 1.9% other. Ages and year in school of participants are presented in Table 4.1.

Descriptive Statistics

Descriptive statistics were examined using the total sample (N = 2890) and by splitting the sample by gender. The term gender will be used here to denote males and females and thus not create confusion with regard to sex when referring to sexual behaviors. Table 4.2 shows means and standard deviations for the total sample, females, and males.

Table 4.1

Frequencies: Age and Year in School: Total Sample

Age	N	Percentage	Year in School	N	Percentage
18	830	28.7%	1st year	1422	52.2%
19	995	34.4%	undergraduate		
			2 nd year	664	24.4%
20	454	15.7%	undergraduate		
			3 rd year	341	12.5%
21	300	10.4%	undergraduate		
			4 th year	208	7.6%
22	161	5.6%	undergraduate		
			5 th or more	82	3.0%
23	81	2.8%	undergraduate		
			Graduate	4	0.1%
24	37	1.3%	Adult Special	2	0.1%
25	32	1.1%	Other	2	0.1%

Table 4.2

Descriptive Statistics all Variables

Variable	N	Mean	Standard deviation
Gender	2744	1.47	0.499
Age	2890	19.49	1.514
Female	1387	19.29	1.368
Male	1181	19.71	1.620
Year in school	2725	1.86	1.128
Female	1335	1.81	1.078
Male	1100	1.94	1.188
Perceived health	2873	2.37	0.821
Female	1387	2.42	0.789
Male	1181	2.29	0.835
Exercise	2842	3.97	2.020
Female	1373	3.80	1.977
Male	1165	4.14	2.054
Nutrition	2734	2.39	0.643
Female	1382	2.42	0.632
Male	1176	2.34	0.656
Weight management	2725	2.62	0.915
Female	1395	2.56	0.687
Male	1193	2.69	1.122
Weight status (RBMI)	2587	2.24	0.597
Female	1322	2.14	0.573
Male	1125	2.37	0.693
Condom use	1434*	5.31	1.635
Female	1324	3.47	2.260
Male	1090	3.46	2.355
Condom last time vaginal intercourse	2649	2.13	0.835
Female	1354	2.11	0.805
Male	1141	2.16	0.863
Number of sexual partners	2844	1.72	2.863
Female	1373	1.49	2.029
Male	1160	2.01	3.558
Vaginal intercourse	2792	3.48	2.530
Female	1348	3.69	2.582
Male	1139	3.30	2.459

Table 4.2 continued on page 58

Table 4.2 continued

Typical student condom use	2788	4.54	0.751
Female	1357	4.51	0.697
Male	1133	4.58	0.802
Typical student number of sexual partners	2814	3.86	5.183
Female	1361	4.06	5.574
Male	1146	3.71	5.192
Typical student vaginal intercourse	2806	3.55	1.529
Female	1361	3.87	1.555
Male	1140	3.20	1.401

* omitted students that had never had VI, or did not have VI in the past 30 days

Perceived Health

Table 4.3 shows frequencies from the total sample and the sample split by gender for the question “Considering your age, how would you describe your general health?” Briefly, 13.4% of the total sample considered their health to be excellent, and 10.8% of females and 16.5% of males rated their health as excellent.

Table 4.3

Frequencies: Perceived Health

	N	Excellent	Very Good	Good	Fair	Poor
Total	2873	13.4%	44.4%	35.5%	5.8%	0.7%
Female	1387	10.8%	44.0%	38.2%	6.4%	0.6%
Male	1181	16.5%	44.7%	32.5%	5.4%	0.8%

Exercise

The general recommendation for frequency of exercise per week is three to five days (ACSM, 2006). Overall 42.4% of the total sample did not meet the minimum recommended amount of exercise per week. When the sample was split by gender more females than males did not meet this recommendation (46.2% of females and 38.9% of males). See Table 4.4.

Table 4.4

Frequencies: Days per Week of Vigorous Exercise

	N	0	1	2	3	4	5	6	7
Total	2842	14.6%	12.1%	15.7%	19.7%	12.5%	12.8%	7.6%	5.0%
Female	1373	16.0%	12.9%	17.3%	19.7%	11.8%	11.9%	6.4%	4.1%
Male	1165	13.5%	11.4%	14.0%	19.4%	13.1%	14.2%	8.3%	6.1%

Nutrition

Nutrition recommendations are revised every five years through the U.S. Department of Health and Human Services and the U.S. Department of Agriculture. The current (2005) nutrition recommendations with regard to fruits and vegetables for a 2000 calorie diet are 2 cups (four servings) of fruit and 2 ½ cups (five servings) of vegetables. The previous (2000) recommendations for fruits and vegetables were 2-4 servings of fruit and 3-5 servings of vegetables (US Department of Health and Human Services, 2005). When the NCHA-ACHA was developed (1998) the nutrition recommendations were the

same as the 2000 recommendations. Overall, 94.3% of the total sample did not meet the recommendations of fruits and vegetables per day. The percentage of males and females that did not meet the recommendations for fruits and vegetables was similar to the total sample (94.6% and 94.0%, respectively). Table 4.5 shows where this specific sample of college students fit into the recommendations for nutrition.

Table 4.5

Frequencies: Nutrition Recommendations Servings of Fruits and Vegetables per Day

	N	Don't eat	1-2	3-4	≥ 5
Total	2734	3.1%	60.9%	30.3%	5.7%
Female	1382	1.7%	60.2%	32.1%	6.0%
Male	1172	4.8%	61.8%	27.9%	5.4%

Weight Management

Question 36 of the NCHA-ACHA asked if students were trying to do anything about their weight. Overall, 43.6% were trying to lose weight and 16.0% were trying to gain weight. When the sample was split by gender 61.4% of females and 23.1% of males were trying to lose weight and 1.9% of females and 32.9% of males were trying to gain weight. See Table 4.6.

Table 4.6

Frequencies: Weight Management

	N	No	Stay the same	Lose weight	Gain weight
Total	2725	14.1%	26.1%	43.8%	16.0%
Female	1395	9.4%	27.3%	61.4%	1.9%
Male	1193	19.4%	24.6%	23.1%	32.9%

Body Mass Index

Body mass index is a relationship between weight and height and is determined by dividing weight in kilograms (kg) by height in meters squared (m²). Body mass index can be used to classify a person as underweight, desired weight, overweight, or obese. The majority of students were classified as desired weight (total 70.9%, females 77.1%, males 65.1%). The incidence of obesity was almost two times higher in males than females (5.9% vs. 3.0%). Table 4.7 shows the frequency of BMI weight classifications for the total sample, females, and males.

Condom Use

Students were asked how often they used condoms when they had vaginal intercourse during the past 30 days and how often they thought the typical student used condoms under the same circumstances (N = 2709). When students that reported never having had vaginal intercourse, or that had not had vaginal intercourse in the past 30 days, 1275 students were omitted from the data (reported N = 1434). Almost 26% never used a condom and 35.9% always used a condom. When the sample was split by gender

29.0% of females and 22.0% of males never used a condom, and 33.0% of females and 39.1% of males always used a condom. These data are shown in Table 4.8.

Table 4.7

Frequencies: Body Mass Index Classifications

	N	Underweight	Desired weight	Overweight	Obese
Total	2810	4.7%	70.9%	19.8%	4.7%
Female	1376	6.5%	77.1%	13.4%	3.0%
Male	1232	2.5%	65.1%	26.5%	5.9%

Table 4.8

Frequencies: Condom Use During Vaginal Intercourse in the Past 30 Days, Typical Student Condom Use During Vaginal Intercourse in the Past 30 Days

	<u>Condom Use</u>			<u>Typical Student Condom Use</u>		
	Total	Female	Male	Total	Female	Male
N	1434*	773*	601*	2788	1357	1133
Never	25.9%	29.0%	22.0%	0.6%	0.6%	0.4%
Rarely	9.4%	10.6%	8.0%	5.4%	6.0%	5.0%
Sometimes	8.9%	9.3%	8.5%	33.6%	36.7%	29.2%
Mostly	19.9%	18.1%	22.5%	55.8%	53.8%	59.2%
Always	35.9%	33.0%	39.1%	3.7%	2.7%	4.6%

* Students that had never had vaginal intercourse or had not had vaginal intercourse in the past 30 days were omitted

Students were also asked if they used a condom the last time they had vaginal intercourse (N = 2792). Again, when students that had never had vaginal intercourse were eliminated from the data, 1377 students were omitted (reported N = 1415). Overall, 47.1% did not use a condom, 52.6% did use a condom, and 0.4% did not know. More females than males did not use a condom the last time they had vaginal intercourse (47.3% vs. 37.2%). See Table 4.9.

Table 4.9

Frequencies: Condom Use the Last Time Vaginal Intercourse

	N	Did not use	Did use	Did not know
Total	1415*	47.1%	52.6%	0.4%
Female	1045*	47.3%	52.2%	0.5%
Male	878*	37.2%	61.3%	1.5%

* Students that had never had vaginal intercourse were omitted

Number of Sexual Partners

Students were asked how many sexual partners they had had in the past year as well as how many partners they thought the typical student had had in the past year. The range of sexual partners for the total sample was 0-53, with 27.1% of students reporting 0 partners in the past year, and 38.9% having had 1 partner in the past year. These

percentages were similar amongst females and males, 24.3% of females and 29.5% of males reported 0 partners in the past year. The number of sexual partners that students thought the typical student had had was very different than what students reported personally. The range was 0-85 partners (females reported a range of 0-85 and males 0-70) for the typical student. Only 1.3% of the total sample thought that the typical student had 0 partners, with 0.7% of females and 1.3% of males reporting the same. Table 4.10 shows number of sexual partners in the past year frequencies for students and Table 4.11 shows students' perceptions of the typical student and number of partners in the past year. It should be noted that in Tables 4.10 and 4.11 some percentages are reported as 0.0. While percentages seem trivial there were still cases associated with these percentages and these are reported as frequencies in Tables 4.10 and 4.11.

Vaginal Intercourse Frequency

Question 23 of the NCHA-ACHA asked if a student was sexually active how many times in the past month had he or she had vaginal intercourse. Question 24 asked how many times in the past month students thought the typical student had had vaginal intercourse. Some students answered that they had never had vaginal intercourse (29.3% of total, N = 2792; 27.7% of females, N = 1348; and 30.2% of males, N = 1139). The percentage of the total sample reporting that they had not had sex in the past month was 21.9% (19.0% of females and 24.8% of males), but only 2.4% of the total sample (1.1% of females, 3.6% of males) thought the typical student had not had vaginal intercourse in the past month. Interestingly, 14.1% of the total sample (n = 2792) reported having had vaginal intercourse ≥ 11 times whereas only 6.5% of the sample thought the typical

student had done this ≥ 11 times. Table 4.12 displays the data on vaginal intercourse in the past month from students and students' perceptions of the typical student.

Table 4.10

Frequencies: Number of Sexual Partners in the Past Year

	Total	Frequency	Female	Frequency	Male	Frequency
N	2844		1373		1160	
0-3	88.3%	2512	91%	1250	84.8%	984
4-7	9.0%	259	7.6%	106	11.2%	130
8-11	1.5%	43	1.0%	14	2.1%	24
12-15	0.6%	17	0.1%	1	1.1%	12
16-19	0.0%	2	0.0%	0	0.2%	2
20-23	0.0%	2	0.1%	1	0.1%	0
24-27	0.0%	2	0.0%	0	0.2%	2
28-31	0.1%	2	0.0%	0	0.2%	2
32-35	0.0%	1	0.0%	0	0.1%	1
36-39	0.0%	0	0.0%	0	0.0	0
40-43	0.0%	2	0.0%	0	0.1%	1
44-47	0.0%	1	0.1%	0	0.0%	0
48-51	0.0%	0	0.0%	0	0.0%	0
52-55	0.0%	1	0.0%	0	0.1%	1
56-59	0.0%	0	0.0%	0	0.0%	0
60-63	0.0%	0	0.0%	0	0.0%	0
64-67	0.0%	0	0.0%	0	0.0%	0
68-71	0.0%	0	0.0%	0	0.0%	0
72-75	0.0%	0	0.0%	0	0.0%	0
76-79	0.0%	0	0.0%	0	0.0%	0
80-83	0.0%	0	0.0%	0	0.0%	0
84-87	0.0%	0	0.0%	0	0.0%	0

Table 4.11

Frequencies: Number of Sexual Partners of Typical Student in the Past Year

	Total	Frequency	Female	Frequency	Male	Frequency
N	2814		1361		1146	
0-3	65.5%	1843	61.8%	841	69.4%	795
4-7	28%	787	32%	436	23.7%	271
8-11	4.8%	131	4.6%	62	4.8%	54
12-15	0.6%	19	0.5%	8	0.7%	8
16-19	0.0%	2	0.1%	1	0.1%	1
20-23	0.2%	9	0.2%	2	0.5%	6
24-27	0.1%	2	0.0%	0	0.2%	2
28-31	0.1%	5	0.1%	2	0.2%	2
32-35	0.0%	1	0.0%	0	0.1%	1
36-39	0.0%	0	0.0%	0	0.1%	1
40-43	0.0%	1	0.1%	1	0.0%	0
44-47	0.0%	0	0.0%	0	0.0%	0
48-51	0.1%	2	0.1%	2	0.0%	0
52-55	0.0%	1	0.1%	1	0.0%	0
56-59	0.0%	0	0.0%	0	0.0%	0
60-63	0.1%	3	0.1%	1	0.2%	2
64-67	0.0%	1	0.0%	0	0.1%	1
68-71	0.1%	3	0.1%	1	0.2%	2
72-75	0.0%	0	0.0%	0	0.0%	0
76-79	0.0%	0	0.0%	0	0.0%	0
80-83	0.0%	1	0.1%	1	0.0%	0
84-87	0.1%	2	0.1%	2	0.0%	0

Table 4.12

Frequencies: Vaginal Intercourse in the Past Month and Typical Student Vaginal Intercourse in the Past Month

	<u>VI in the Past Month</u>			<u>Typical Student VI in the Past Month</u>		
	Total	Female	Male	Total	Female	Male
N	2792	1348	1139	2806	1361	1140
Never had VI	29.3%	27.7%	30.2%			
0	21.9%	19.0%	24.8%	2.4%	1.1%	3.6%
1-2	10.7%	11.0%	10.4%	27.6%	21.0%	34.9%
3-4	6.5%	6.9%	6.4%	26.3%	25.0%	28.0%
5-6	6.4%	7.1%	6.1%	18.6%	20.0%	16.9%
7-8	5.5%	6.1%	4.9%	12.6%	16.0%	8.9%
9-10	5.5%	6.8%	4.2%	6.0%	8.5%	3.6%
≥ 11	14.1%	15.4%	13.0%	6.5%	8.2%	4.1%

Correlations

Correlations were run for all of the research questions listed above. A Pearson's product-moment correlation coefficient, r (Pearson's r) was used for all normally distributed variables and a Spearman ρ (r_s) was used for all skewed variables (Leech, et al. 2005; Pallant, 2007). The research questions addressed three areas: (1) exercise, nutrition, and weight management; (2) sexual behavior; and (3) social norms and sexual

behavior. This section will follow the order of the research questions and report correlations or analysis of variance results via text and tables.

Area One

Area one was: What is the relationship between college students' perceived health and preventative health practices related to exercise, nutrition, and weight management in females and males? The specific questions in area one were:

- 1a) What is the relationship between perceived health and number of exercise sessions in the last seven days? Is there a difference between males and females?
- 1b) What is the relationship between perceived health and meeting, or not meeting, the recommended five servings of fruits and vegetables per day?
- 1c) What is the relationship between perceived health and weight maintenance or weight loss?
- 1d) What is the relationship between perceived health and BMI?

There was a medium negative correlation between students' perceived health and exercise (Pearson's $r = -0.342$, $p < 0.01$, two tailed). Similar negative correlations were found in females and males (Pearson's $r = -0.307$, and $r = -0.366$, $p < 0.01$, two tailed) indicating that those that exercised more also perceived their health to be better. Please refer to Tables 4.13, 4.14, and 4.15 for correlations between perceived health and the independent variables from area one for the total sample, females, and males.

Table 4.13

Correlations between Perceived Health and Area One Variables: Total Sample

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i> *
Perceived health	2696	2.37 \pm 0.815		
Exercise	2660	3.96 \pm 2.003	-0.342**	
Nutrition	2556	2.39 \pm 0.638	-0.148**	
Weight management	2550	2.63 \pm 0.905	-0.011	
Weight status (BMI)	2573	2.25 \pm 0.640		0.112**

* Spearman *rho* was used because BMI was skewed, skewness = 1.590, kurtosis = 4.636

** Significant at $p < 0.01$

Table 4.14

Correlations between Perceived Health and Area One Variables: Females

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i> *
Perceived health	1384	2.44 \pm 0.801		
Exercise	1363	3.80 \pm 1.947	-0.307**	
Nutrition	1333	2.42 \pm 0.634	-0.125**	
Weight management	1330	2.57 \pm 0.678	0.118**	
Weight status (BMI)	1316	2.13 \pm 0.572		0.153**

* Spearman *rho* was used because BMI was skewed, skewness = 1.499, kurtosis = 5.004

** Significant at $p < 0.01$

Table 4.15

Correlations between Perceived Health and Area One Variables: Males

Variable	N	Mean \pm SD	Pearson's r	Spearman ρ *
Perceived health	1181	2.29 \pm 0.830		
Exercise	1165	4.13 \pm 2.023	-0.366**	
Nutrition	1095	2.34 \pm 0.645	-0.182**	
Weight management	1092	2.70 \pm 1.117	-0.085**	
Weight status (BMI)	1135	2.37 \pm 0.665		0.105**

* Spearman ρ was used because BMI was skewed, skewness = 1.569, kurtosis = 4.160

** Significant at $p < 0.01$

There was a small negative correlation between perceived health and servings of fruits and vegetables per day (Pearson's $r = -0.148$, $p < 0.01$, two tailed). There were also small negative correlations between perceived health and servings of fruits and vegetables per day in females and males (Pearson's $r = -0.125$, and $r = -.182$, $p < 0.01$, two tailed), indicating that those students that ate more fruits and vegetables also rated their health as better than those students that did not eat as many fruits and vegetables.

Perceived health and trying to do anything about weight was not significant for the total sample ($N = 2550$). There was, however, a small positive correlation (Pearson's $r = 0.118$, $p < 0.01$, two tailed) between perceived health and trying to do something about one's weight in females. This indicates that those females that were trying to lose weight perceived their health as better than those that were trying to gain weight. There

was also a small negative correlation (Pearson's $r = -0.085$, $p < 0.01$, two tailed) between perceived health and trying to do something about one's weight in males. This indicates that in males those that were trying to gain weight perceived their health as better than those that were trying to lose weight. The results for males and females were disparate. Therefore, in this instance, males and females seem to have different perceptions of weight and health.

There was a small positive correlation between perceived health and BMI (Spearman $\rho = 0.112$, $p < 0.01$, two tailed) indicating that those that had a lower BMI also perceived their health to be better. There was also a small positive correlation between general health and body mass index in females and males (Spearman ρ , = 0.153, and $r_s = 0.105$, $p < 0.01$, two tailed) indicating that both female and male students with a lower BMI also perceived themselves to be healthier.

The means of the independent variables were also compared using ANOVAs to determine if there were differences between females and males in perceived health, nutrition, exercise, and weight management. A Mann-Whitney U test was used as a nonparametric statistic to compare medians for BMI because this data was skewed (Pallant, 2007). There were statistically significant differences for all ANOVA tests between females and males. For instance, for perceived health: $F(1, 2558) = 20.140$, $p = 0.000$. However when eta squared was examined for all variables, these effect sizes were quite small. These data, including confidence intervals, are presented in Table 4.16.

The Mann-Whitney U test revealed a significant difference in BMI between females ($Md = 2.00$, $n = 1376$) and males ($Md = 2.00$, $n = 1232$), $U = 693117.50$, $z = -10.157$, $p = 0.000$, $r = 0.02$. The effect size (r) indicated a small effect (Cohen, 1988).

Table 4.16

ANOVA Perceived Health, Exercise, Nutrition, and Weight Management, between Females and Males

Variable	df	MS	F	Sig.	eta ²	95% Confidence interval	
						Lower bound	Upper bound
Perceived health	1	13.358	20.140	0.000**	0.008	2.34	2.40
Within Groups	2558	0.663					
Female						2.40	2.48
Male						2.25	2.34
Exercise	1	69.926	17.537	0.000**	0.007	3.88	4.03
Within Groups	2540	3.987					
Female						3.70	3.91
Male						4.02	4.25
Nutrition	1	3.846	9.421	0.002**	0.004	2.36	2.41
Within Groups	2441						
Female						2.39	2.46
Male						2.31	2.38
Wt mgmt	1	11.028	13.517	0.000**	0.006	2.59	2.66
Within Groups	2435						
Female						2.53	2.60
Male						2.64	2.77

** Significant at $p < 0.01$

Area Two

Area two: What is the relationship between perceived health and preventative health practices related to condom use, number of sexual partners, and vaginal intercourse in female and male college students?

2a) What is the relationship between perceived health and condom use?

2b) What is the relationship between perceived health and number of sexual partners in the past year?

2c) What is the relationship between perceived health and vaginal intercourse frequency?

There were no significant correlations between perceived health and number of sexual partners in the past year, vaginal intercourse, condom use in the past month, or condom use during last vaginal intercourse for the total sample, females, or males. These results are presented in Tables 4.17, 4.18, and 4.19.

Table 4.17

Correlations between Perceived Health and Area Two Variables: Total Sample

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners	2696	1.50 \pm 1.68		0.031
VI	2633	3.49 \pm 2.53	0.001	
Condom	2563	3.46 \pm 2.31	-0.001	
Condom last VI	2633	2.13 \pm 8.35	0.015	

Table 4.18

Correlations between Perceived Health and Area Two Variables: Females

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners	1379	1.43 \pm 1.477		0.060
VI	1349	3.69 \pm 2.574	0.012	
Condom	1329	3.49 \pm 2.269	0.026	
Condom last VI	1354	2.12 \pm 0.807	0.033	

Table 4.19

Correlations between Perceived Health and Area Two Variables: Males

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners	1181	1.63 \pm 1.912		0.000
VI	1153	3.29 \pm 2.454	-0.023	
Condom	1106	3.44 \pm 2.352	-0.026	
Condom last VI	1148	2.15 \pm 0.862	0.003	

Means for each variable were also compared between females and males using ANOVAs or Mann-Whitney *U* test. There was a significant difference between females and males in vaginal intercourse in the past month $F(1, 2525) = 16.468, p = 0.000$, however; the effect size was very small ($\eta^2 = 0.007$). There was also a significant difference between females and males in their perception of the number of times the

typical student had had vaginal intercourse in the past month $F(1, 2543) = 134.421, p = 0.000, \eta^2 = 0.05$. This effect size was small-medium (Cohen, 1988). There was a significant difference between genders in their perception of the typical student condom use during vaginal intercourse, but the effect size was quite small ($\eta^2 = 0.002$). Condom use and condom use at last vaginal intercourse were not significantly different. These results are shown in Table 4.20.

Mann-Whitney U tests revealed no significant differences between females and males in number of sexual partners they had had. There were significant differences in females' and males' perceptions of typical student condom use ($Md = 5.00, n = 1413$) and males ($Md = 5.00, n = 1236$), $U = 804635.50, z = -3.943, p = 0.000, r = 0.08$; and typical student number of sexual partners in the past year ($Md = 3.00, n = 1418$) and males ($Md = 3.00, n = 1254$), $U = 749746.50, z = -7.173, p = 0.000, r = 0.14$. The r values, however, revealed that these effects were small.

Table 4.20

ANOVA Condom Use, Typical Student Condom Use, Condom Use Last time Vaginal Intercourse, Vaginal Intercourse, and Typical Student Vaginal Intercourse between Females and Males

Variable	df	MS	F	Sig.	eta ²	95% Confidence interval	
						Lower bound	Upper bound
Condom Use	1	1.748	0.328	0.567	0.0001	3.38	3.56
Within Groups	2447	5.325					
Female						3.37	3.62
Males						3.30	3.58
Typ. Student Condom Use	1	3.441	6.224	0.013*	0.002	4.51	4.57
Within Groups	2530	0.553					
Female						4.47	4.55
Male						4.54	4.63
Vaginal Intercourse	1	104.538	16.468	0.000**	0.007	3.41	3.60
Within Groups	2515	6.348					
Female						3.56	3.83
Male						3.14	3.43
Typical Student VI	1	294.900	134.421	0.000**	0.05	3.49	3.61
Within Groups	2543	2.194					
Female						3.78	3.95
Male						3.10	3.26
Condom Use Last VI	1	0.782	1.128	0.288	0.0004	2.10	2.17
Within Groups	2515	0.693					
Female						2.08	2.16
Male						2.10	2.20

*Significant at $p < 0.05$

** Significant at $p < 0.01$

Area Three

Area three: Social norms theory and sexual behavior. What is the correlation between perception of peer sexual behavior and individual sexual behavior in female and male college students?

3a) Is there a correlation between students' perception of frequency of peer condom use and their own frequency of condom use in the past month?

3b) Is there a correlation between how many sexual partners students perceive the typical student has had in the past year and how many sexual partners they have had in the past year?

3c) Is there a correlation between students' perception of frequency of peer vaginal intercourse in the past month and frequency of their own vaginal intercourse in the past month?

Area three questions were investigated using either a Pearson's r or a Spearman ρ . Results showed that for the total sample as well as females and males, there was a small positive correlation between the number of sexual partners students had had in the past year and the number they perceived the typical student to have, $r_s = 0.214$, $n = 2712$, $p < 0.01$; $r_s = 0.221$, $n = 1384$, $p < 0.01$; and $r_s = 0.222$, $n = 1191$, $p < 0.01$. There was also a medium positive correlation between the number of times in the past month that students had had vaginal intercourse and the number of times they perceived the typical student to have had vaginal intercourse in the past month, $r = 0.357$, $n = 2649$, $p < 0.01$; $r = 0.356$, $n = 1344$, $p < 0.01$; $r = 0.341$, and $n = 1157$, $p < 0.01$. Condom use and typical student condom use were not significantly correlated for the total sample or males. There

was a small negative correlation for condom use and typical student condom use in females. These results are presented in Tables 4.21, 4.22, and 4.23.

Table 4.21

Area Three: Social Norms Theory and Sexual Behaviors Correlations: Total Sample

Variable	N	Mean \pm SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners & typical student	2712	1.50 \pm 1.68		0.214**
partners		3.31 \pm 1.90		
VI & typical student VI	2649	3.49 \pm 2.53	0.357**	
		3.55 \pm 1.53		
Condom use & typical student	2553	3.46 \pm 2.31		-0.032
condom use		4.54 \pm 0.75		

** Significant at $p < 0.01$

Table 4.22

Area Three: Social Norms Theory and Sexual Behaviors Correlations: Females

Variable	N	Mean ± SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners	1384	1.43 ± 1.48		0.221**
Typical Student Partners		3.53 ± 1.89		
VI	1344	3.69 ± 2.57	0.356**	
Typical Student VI		3.87 ± 1.55		
Condom Use	1322	3.49 ± 2.27		-0.089**
Typical Student Condom Use		4.51 ± 0.70		

** Significant at $p < 0.01$

Table 4.23

Area Three: Social Norms Theory and Sexual Behaviors Correlations: Males

Variable	N	Mean ± SD	Pearson's <i>r</i>	Spearman <i>rho</i>
Partners	1191	1.63 ± 1.91		0.222**
Typical Student Partners		3.06 ± 1.88		
VI	1157	3.29 ± 2.45	0.341**	
Typical Student VI		3.18 ± 1.40		
Condom Use	1104	3.44 ± 2.35		0.021
Typical Student Condom Use		4.58 ± 0.80		

** Significant at $p < 0.01$

Chapter V

Discussion

The purpose of this study was to examine Colorado State University (CSU) students' exercise, nutrition, weight management, and sexual behaviors that may enhance disease prevention and those behaviors' relationship to students' perceived health. A secondary purpose of this research was to examine how students' perceptions of their peers' sexual behaviors influence their own sexual behaviors based on social norms theory. The instrument that was used to test these questions was the American College Health Association – National College Health Assessment (ACHA-NCHA), see appendix A. The specific independent variables that were investigated include: body mass index (BMI) classification, weight management, exercise frequency, nutrition practices, condom use, number of sexual partners in the past year, and frequency of vaginal intercourse in the past month. Body mass index was used as an indicator of current health status. The dependent variable was defined as student perceived health. Additionally, the sexual behaviors (i.e., condom use, number of sexual partners, and vaginal intercourse) were examined using the social norms theory as well as correlating these variables to the dependent variable.

The research questions addressed the following areas: (1) exercise, nutrition, and weight management; (2) sexual behavior; and (3) social norms theory and sexual behavior.

Area one: What is the relationship between students' perceived health and preventative health practices related to exercise, nutrition, and weight management in females and males? Area one was broken down into four sub-questions:

1a) What is the relationship between perceived health and number of exercise sessions in the last seven days?

1b) What is the relationship between perceived health and meeting, or not meeting, the recommended five servings of fruits and vegetables per day?

1c) What is the relationship between perceived health and weight maintenance or weight loss?

1d) What is the relationship between perceived health and BMI?

Area two: What is the relationship between perceived health and preventative health practices related to condom use, number of sexual partners, and vaginal intercourse in female and male college students? Area two was broken down into three sub-questions:

2a) What is the relationship between perceived health and condom use?

2b) What is the relationship between perceived health and number of sexual partners in the past year?

2c) What is the relationship between perceived health and vaginal intercourse frequency?

Area three: Social norms theory and sexual behavior. What is the correlation between perception of peer sexual behavior and individual sexual behavior in female and male college students? Area three was broken down into three questions:

3a) Is there a correlation between students' perception of frequency of peer condom use and their own frequency of condom use in the past month?

3b) Is there a correlation between how many sexual partners students perceive the typical student has had in the past year and how many sexual partners they have had in the past year?

3c) Is there a correlation between students' perception of frequency of peer vaginal intercourse in the past month and frequency of their own vaginal intercourse in the past month?

This chapter will review the findings as they relate to this study and the current literature. The sample is described (i.e., school year, age, etc.) in Tables 4.1 and 4.2 in chapter four. First, a brief summary will be provided of all significant findings. Second, each of the main variables (perceived health, exercise, nutrition, weight management, body mass index, condom use, number of sexual partners in the past year, and frequency of vaginal intercourse in the past month) will be discussed regarding frequencies as these relate to the literature. Third, this discussion will address correlations between each variable and perceived health, correlations between sexual behavior and perception of peer sexual behavior based on the social norms theory, and mean differences between females and males for all significant variables.

Overall, in Area One, there was a significant correlation between exercise, nutrition, and weight status (BMI), and perceived health for the total sample, females, and males. The correlation between weight management and perceived health was significant in females and males, but not for the total sample. ANOVAs revealed that

there were significant differences between females and males in perceived health, exercise, nutrition, and weight management.

Area Two showed no significant correlations between condom use, number of sexual partners, or vaginal intercourse and perceived health for the total sample, females, and males. There were, however, significant differences between females and males in their perceptions of the typical student condom use, vaginal intercourse, and the typical student vaginal intercourse.

Area Three, social norms theory and sexual behaviors, indicated that there were significant correlations between student number of sexual partners and the perceived typical student number of sexual partners in the past year, and frequency of vaginal intercourse and the typical student frequency of vaginal intercourse for the total sample, females, and males. There was also a significant correlation between condom use and the typical student condom use in females only. Each variable will now be discussed in terms of frequencies as well as its relationship to perceived health.

Area One

Exercise

Physical activity, which can be achieved through exercise, is an important lifestyle factor that can reduce the risk of several diseases including heart disease, type two diabetes, hypertension, obesity, osteoporosis, some cancers, anxiety, and depression (Pate, Pratt, Blair, Haskell, Macera, Bouchard, et al., 1995). These diseases become more prevalent throughout adulthood, via aging and potentially changing lifestyle processes. Even moderate exercise (30 minutes at least 3 days per week, ACSM, 2006) may help an

individuals stave off the aforementioned diseases and disorders. It is known that physical activity declines from childhood to adulthood (Caspersen, Pereira, & Curran, 2000). Therefore, college may be a pivotal time where people can establish health enhancing exercise and physical activity practices that in turn may impact their future health. Overall, this study found that the level of inactivity was not as bleak as some other studies. However, the proportion of students that did not exercise, or did not meet the minimum recommended amount of exercise was approximately half.

Overall, 57.6% of the total sample met at least the minimum recommended amount of exercise per week (≥ 3 days/week). This figure is in agreement with Pinto et al. (1998) who found that 58% of college students exercised at least three days per week and Randall, Han, Dinger, Heesch, Fields, and Knehans (2007) that found that 48.2-55.5% of college females maintained high physical activity over the course of a yearlong study. This study, however, did not agree with several other previous studies regarding exercise and college students. For instance, the 2003 ACHA report on 33 colleges across the United States found that only 44.2% of students met the minimum recommendation for exercise, Douglas and Collins (1997) found this figure to be 37.6%, and Haberman and Luffy (1998) found this figure to be 39%.

A possible reason for the disparity between this study and those mentioned above is that both the Douglas and Collins and the ACHA study took information from many schools in various areas of the United States. Thus in compiling that information schools may have been included in areas where exercise was not the norm. Colorado, on the other hand, is thought to be one of the healthier states in terms of obesity rates, as was

mentioned in chapter two, and active lifestyles among individuals that live here (Centers for Disease Control and Prevention, 2007a; Centers for Disease Control and Prevention, 2008a). For instance, in 2006 82.6% of Colorado adults reported that they participated in physical activity in the past month versus 77.4% of adults nationwide (Centers for Disease Control and Prevention, 2008a).

It may also be assumed that this study and those performed previously resulted in different statistics on exercise frequency because a difference in the studies of several years. However, in a recently published study Irwin (2007) found that only 35% of university students at two universities in Canada maintained enough physical activity to incur health benefits. Therefore, it seems that this issue of inactivity in college students spans this and the previous century.

Another possible reason for the high figure of total exercisers in this study may have been because this survey was administered in general education health classes. Because of this fact students that may have previously been inactive may have increased their activity as a result of the course they were in. The lasting effect however, may have been limited.

When exercise frequency was broken down by gender it was clear that more males than females reached the minimum recommendation for exercise (61.1% of males versus 53.9% of females), and more females than males did not exercise at all (16.0% of females versus 13.5% of males). Other studies have found similar discrepancies between genders (Caspersen et al., 2000; George, 2000; Huang et al., 2003). This study also found that there was a medium negative correlation between perceived health and exercise

indicating that the total sample, females, and males all perceived their health to be better if they exercised more. In looking back at the percentage of females versus males that ranked their health as excellent (10.8% versus 13.4%) it makes sense that, if students are using exercise frequency as a marker of health, more males ranked their health as excellent than females because by and large more males exercised more often than females. The ramifications of these findings may be long lasting. If based on the pattern that students develop their exercise and nutrition habits during college, and they do not seem to improve in adulthood (based on the CDC's Healthy People 2010 statistics); then it can be expected that whereas a small majority of males and a smaller majority of females currently do meet the recommendations for exercise, those majorities will most likely become minorities after college and into adulthood.

ANOVAs indicated that there were significant differences in perceived health and exercise between females and males. The effect sizes for these differences, however, were very small (e.g., $\eta^2 = 0.007-0.008$). Although the effect sizes were small these results can still be interpreted as an indication that males and females may think about health and potential healthy practices (such as exercising regularly) differently. Therefore, education and outreach to college students, and female and male college students in particular, should be developed with these potential differences in mind. In other words, what may be taken from these findings is that more males than females perceive exercise to be important, as is shown in their self-assessment of health. Health programs, therefore, should address these discrepancies as they try to enhance health via exercise and physical activity opportunities and education for college students.

Nutrition

Nutrition is also thought to have an impact on long term health. For instance, diets low in fiber and high in saturated fat are associated with obesity, diabetes, intestinal disorders, and some cancers (Williams, 2007). Diets high in saturated fat and cholesterol are also associated with heart disease, the number one cause of death in the United States (Centers for Disease Control and Prevention, 2008b). The general recommendations for fruit and vegetable intake per day are revisited and potentially revised every five years. The previous recommendation, (that the ACHA-NCHA was based on), combined was at least five servings of fruits and vegetables per day (2-3 servings of fruit, and 3-4 servings of vegetables). Today the recommendation is two cups of fruit (4 servings) and two and a half cups of vegetables (5 servings) per day for a total of combined 9 servings of fruits and vegetables per day (US Department of Health and Human Services, 2005).

Whereas this study found that students by and large exercised more than in other studies, students in this study were on par with existing literature in terms of low fruit and vegetable intake based on the 2000 recommendations. This study found that 94.3% of all students did not meet the 2000 recommendations for fruit and vegetable intake per day. These findings were congruent with others found in the literature where 2-30.2% of college students met the fruit and vegetable recommendations (American College Health Association, 2005; Anding et al., 2001; Cason & Wenrich, 2002; Douglas & Collins, 1997; Huang et al., 2003; Racette, Deusinger, Strube, Highstein, & Deusinger, 2008).

Although only 5.7% of the total sample achieved the recommended amount of fruits and vegetables per day, nutrition was significantly negatively correlated with

perceived health for the total sample, females, and males. Thus those students that perceived their health to be better also ate more fruits and vegetables than those students that did not perceive their health to be as good. This indicates that to these students, along with exercise, nutrition is a positive marker for health and one behavior students use to self-assess their health. When an ANOVA was run there was also a significant difference between females and males with regard to nutrition. The η^2 , however, was quite small indicating a small effect size. Nevertheless it is clear from these results that, although students perceive that nutrition is important for good health, most students in this study did not eat a diet rich in fruits and vegetables.

This study was based on the 2000 recommendations for fruits and vegetables. Based on the current recommendations students from this study would be even further behind in obtaining the daily fruits and vegetable recommendations. Kolodinsky, Harvey-Berino, Berlin, Johnson, and Reynolds (2007) performed a study to examine the relationship between what college students ate and their level of nutritional knowledge based on the newer (2005) nutrition recommendations. The results from their study were more positive than for this one. They found that approximately one third of students ate less than the recommended fruits and vegetables, and approximately one third ate the recommended amount. They also found that those students that were more educated about the recommendations were more likely to eat at least the recommended amount of fruits and vegetables. Therefore, with regard to this study perhaps education is one way to increase college student fruit and vegetable intake.

Another concept to consider is that just over half of respondents in this study were first year students. It can be assumed that many of these students lived in the residence halls. Institutional food is known to be higher in fat and calories than homemade food (Kolodinsky et al., 2007). Other students have complained that it is hard to eat well because of limited food choices in the dining halls and expense (Cason & Wenrich, 2002). Therefore one cause for the low fruit and vegetable intake in this study may have been due to limited healthy food choices in the residence hall dining rooms.

The conclusions to be made from this section of this study are that education is imperative to increase students' nutritious food choices, and healthier foods should be made more available to those students living on campus. With these two functions in place it is more likely that college students will have an easier time maintaining a healthy body weight and reduce their risk for poor nutrition related diseases (i.e., heart disease and diabetes).

Weight Management and Body Mass Index

Maintaining a healthy body weight and/or BMI via regular exercise and sensible nutrition is important in disease prevention as well as quality of life. This study found mixed results in terms of BMI for females and males trying to do something about their weight. First, 70.9% of the total sample, 77.1% of females, and 65.1% of males were considered healthy weight (based on a BMI between 18.5 and 24.9 kg/m²). These figures are in line with Healthy Campus 2010 (66.8% healthy weight). Overweight and obese varied for males and females as well. For the sake of this discussion overweight and obese will be added together and placed in the overweight category. This sample showed

that 24.5% of the total sample, 16.4% of the females, and 32.4% of the males were considered overweight. This becomes interesting when weight management and trying to do anything about one's weight is also examined. Based on those results 43.8% of the total sample, 61.4% of females, and 23.1% of males were trying to lose weight. Thus more females by over three times were trying to lose weight than were overweight and fewer males were trying to lose weight than were overweight. What is also interesting is that whereas only 1.9% of females were trying to gain weight 32.9% of males were trying to gain weight. These dichotomies in actual weight and trying to do anything about one's weight are congruent with other studies (American College Health Association, 2005; Connell et al., 2005; Douglas & Collins, 1997; Haberman & Luffey, 1998; Volicer et al., 2003).

The cause for these discrepancies may be due to issues with the validity of BMI as a measure of weight status and/or societal factors that hold different expectations for males and females with regard to weight and appearance. In terms of BMI, one cause for the discrepancy between weight management and BMI in males may be that because many of the male subjects exercised regularly their BMIs may have indicated that they were overweight or obese when in fact they may have just been very muscular and therefore heavier. Perhaps too, females were more aware of their body weight and trying to maintain a low body weight than males, and that is why more females than males were currently at a healthy body weight but also trying to lose weight.

In examining the results of BMI for the total sample and comparing them to the most current data on adults and children in United States, the current results fall

somewhere in the middle. For instance the current statistic on adult (over 20 years old) overweight and obesity is 66% and 33% respectively (National Center for Health Statistics, 2007a). The current statistics on children (12-19 years old) for overweight (including obese) is 17% (Centers for Disease Control and Prevention, 2007b). This implies that there is a shift from childhood to adulthood that very well may develop during the college years and result in lasting overweight and obesity through adulthood. Despite the relatively high number of the total sample that were classified as overweight, correlations between weight status and perceived health indicated students considered body weight as an important factor in health.

Correlations between BMI and perceived health, and weight management and perceived health were consistent between females and males. In both cases there was a significant small negative correlation between weight management and perceived health indicating that those that were trying to lose weight considered their health to be better. There was also a significant small positive correlation between BMI and perceived health indicating that those that weighed less also perceived their health to be better. It should be noted that these correlation r values were slightly higher for females. An ANOVA showed females and males to be significantly different with regard to weight management and BMI. This result makes sense considering that males and females were different in frequency of overweight and trying to lose weight. As stated previously it appears that females and males have different views of weight management and BMI.

Results from Area One show that this sample of college students considered exercise, nutrition, weight management, and BMI to be important indicators of health

when self assessing their own health. Area two, sexual behaviors, did not convey similar results.

Area Two

Sexually transmitted diseases (STD) represent five of the 10 most frequently reported diseases in the United States (Eng & Butler, 1997). According to the executive summary by the National Academy of Sciences published in 1997, each year there are approximately 12 million new cases of STDs, and of these three million are in teenagers. One area that is of particular concern is the disproportionate number of women who are affected by STDs. Women are more susceptible to STDs because their biology lends to greater rate of transmission. In addition, women may be asymptomatic and therefore at higher risk of complications due to STDs than men. Some of the side effects that impact women include infertility, ectopic pregnancy, and chronic pelvic pain (Eng & Butler, 1997). Also, because women may not have symptoms of an STD they are more likely to pass an STD on to their sexual partners. Two factors that may increase risk for STD transmission in men and women are condom use and number of sexual partners. In addition the greater level exposure that one has, via sexual intercourse frequency, the greater chance he or she may have of contracting and/or passing on an STD.

Protective sexual behaviors may be, but based on the current study are not, thought of as important indicators of health. For instance, with regard to STDs and infections, using a barrier method, such as condoms, can help prevent infection. In addition, limiting one's sexual partners can also help reduce the risk of STDs.

This section will review frequencies with regard to condom use, number of sexual partners, and frequency of vaginal intercourse. In addition, correlations and ANOVAs will be discussed with regard to these variables and perceived health and females and males. In the next section these variables will be discussed with regard to social norms theory.

Condom Use

The current study found that with regard to condom use during vaginal intercourse, 25.9% of students never used a condom, and 35.9% always used a condom. These results are consistent with other literature on condom use during vaginal intercourse (American College Health Association, 2002; Tulloch et al, 2004). Brown and Venable (2007) found that 39% of students did not use condoms during vaginal intercourse and that of those who drank before sex 47% did not use protection. Brown and Venable also found no differences in condom use between genders. This study, however; found that females used condoms less than males (29.0% versus 22.0%). This trend was seen in other studies as well. For instance, Douglas and Collins (1997) found that females were less likely to use condoms than males. Specifically, 25.1% of females versus 32.4% of males used condoms consistently, and 25.8% of females versus 35.2% of males used condoms the last time they had vaginal intercourse.

The current study also examined the proportion of students that used a condom the last time they had vaginal intercourse. Based on this question 47.1% did not use a condom, and 0.4% did not know. Again, more females than males did not use condoms the last time they had vaginal intercourse (47.3% versus 37.2%). The American College

Health Association (2002) also found this tendency. In their study more males than females used condoms (44.0% versus 31.2%) the last time they had vaginal intercourse. The causes of the difference between females and males under both circumstances may be numerous. One interpretation of these results is that males are typically responsible for providing and putting on condoms (Eng & Butler, 1997; Smith, 2003). Therefore more females than males may have reported not using condoms because they did not feel responsible for carrying and/or using condoms and potentially asking their partner to do so. Smith (2003) also mentioned potential power inequities between males and females as a precursor to non-condom use. Carter, McNair, Corbin, and Williams (1999) also examined differences between male and female condom use and negotiation practices. They found that the main reasons females cited for not using condoms were using birth control pills, feeling they were not at risk, inconvenience, and other. They also found that males in their study were more likely to wait until the female initiated condom use, and if she did not then the male would not use one. Therefore, based on Carter et al. condom use differences between genders in this study may be simply due to females using another form of birth control, or not perceiving themselves as at risk for pregnancy or STDs.

A major problem with this assumption is that females have increased susceptibility to STDs (Eng & Butler, 1997). This increased susceptibility as well as the tendency for females to be asymptomatic is not only risky for them but also their partners (Eng & Butler). Therefore, females may be carrying and spreading STDs without knowledge of doing so. Also at issue, as this study found and will discuss below, is that students did not take sexual protective behaviors into account when self assessing health.

Thus, based on the current study, protective behaviors were not deemed an important factor when one taking care of one's health.

Correlations between condom use and perceived health were not significant. Thus students in this study did not take protective sexual behavior, via condom use, into account when assessing their health. Additionally, ANOVAs showed no differences between females and males in condom use in the past month and at last vaginal intercourse. Thus, students were not taking this protective sexual behavior into account when analyzing their own health. Therefore, it seems that even students that may think that their health is important may not take steps to protect themselves against STDs and thus not consider the health consequences associated with STDs. This study did not look at STD prevalence and its relationship to perceived health. It may be assumed, however, that students do not consider sexual behaviors as a health factor unless they have an STD. Perhaps in this case, students only consider protective sexual practices when they have been personally affected by the consequences of not protecting themselves via a barrier method or restricting their number of sexual partners.

Number of Sexual Partners

Limiting one's number of sexual partners is also considered as protection against STDs (Eng & Butler, 1997). This study examined the number of sexual partners that students had as well as how this correlated with perceived health. Number of sexual partners will be discussed in more detail in the third area, in conjunction with social norms. Briefly, most students (total sample, 93.1%; females, 92.0%; males, 92.8%) had 0-1 partners in the past year. There were no significant correlations between number of

sexual partners and perceived health for the total sample, females, or males. A Mann-Whitney *U* test revealed that there was a significant difference between females and males in number of sexual partners in the past year, however, the effect size of this difference was quite small ($r = 0.14$). Once more, most students had three or fewer partners (total sample, 88.3%).

Again, restricting the number of sexual partners one has is one way to reduce the risk of an STD. It seems that, overall, the students in this study were limiting the number of partners that they had had over the past year. However, because number of partners was not significantly correlated with perceived health, preserving health does not seem to be the reason for maintaining a low number of sexual partners. Additionally, there was a minority of students that reported a large number of partners in the past year, which also differed for females and males.

Genders differed in the total number of partners over the past year. The highest number reported by females was 46 and by males 53. While these numbers are extreme, and potentially false, or misrepresentative of actual behavior, other studies have also cited that males by and large have more sexual partners than females (Douglas & Collins, 1997). Other authors have pointed to the idea that this population may be misreporting their number of partners and that there is not as big a difference between them as there appears to be (Cohen & Shotland, 1996). In the next section, on social norms, females report a much higher estimate of the number of partners the typical student has had. Therefore, perhaps students not only lie on questionnaires but also to each other and thus drive outrageous misperceptions of others' behaviors.

Vaginal Intercourse Frequency

The final sexual behavior that was examined was frequency of vaginal intercourse frequency over the past month. Frequency of vaginal intercourse, when looked at from an overall exposure to STDs perspective, can also be considered a health factor. Namely, limiting one's exposure can be viewed as a protective practice against STDs. Frequency of vaginal intercourse will be discussed in more detail in the social norms section of this chapter.

Vaginal intercourse frequency and perceived health were not significantly correlated. An ANOVA, however, revealed a significant difference between genders in vaginal intercourse frequency. Based on these results, it is apparent that there are differences between females and males in vaginal intercourse frequency. At the same time, neither gender seemed to consider this health variable as an important factor when examining their own health. In fact, more males ranked their health as excellent, and males also had a higher frequency of vaginal intercourse (this was an observation of the descriptive data but not a significant correlation).

Cohen and Shotland (1996) performed a study that investigated when college students expected sexual intercourse to occur and the degree to which those expectations had an impact on first intercourse. In their study they looked for gender differences with regard to sexual intercourse expectations. They found overall that males and females had different expectations of when sex should occur (men sooner in a relationship, women later in a relationship). They pointed out a potential cause of these expectations and the reality of when college students engage in sex as societal expectations of female and male

behavior. They also found that by and large the believed norm about the average person was that he or she was more sexually permissive than he or she actually was. This is an example of students having misperceptions of their peers which may, in turn, impact their own behavior in a negative way. This idea is discussed further in the next section on the social norms theory and sexual behavior.

Area Three: Social Norms Theory and Sexual Behavior

Social norms theory was coined by Perkins and Berkowitz in the mid 1980s (Perkins & Berkowitz, 1986). The essence of social norms theory is that if one believes that others are engaged in a behavior then that individual is more likely to engage in that behavior regardless of whether or not his or her perception is correct. Berkowitz (2004) coined this difference between perception and reality “misperception”. The “gap between ‘perceived’ and ‘actual’ is referred to as a ‘misperception’, and it’s effects provide the basis for social norms approach” (Berkowitz, p. 5). In addition, there are several types of misperceptions. Pluralistic ignorance has been described in various ways. Essentially pluralistic ignorance is when the majority believes there is a difference between them and others in how they behave and think when in actuality there is not (Allport, 1924, in Chia & Gunther, 2006; Berkowitz). Other types of misperceptions include false consensus when a minority believes their behavior is the norm when in fact it is not. Finally, false uniqueness involves individuals believing they are more unique than they are (Berkowitz). Social norms theory also describes two types of norms: injunctive and descriptive. An injunctive norm is an attitude or feeling based on morals or beliefs. A descriptive norm has to do with behavior or what people do (Berkowitz). In terms of

social norms theory and sexual behavior in college students, all types of misperceptions as well as norms may be engaged.

The ACHA-NCHA contained questions regarding sexual behaviors (condom use, number of sexual partners, and vaginal intercourse) as well as questions about the typical student's level of engagement in these behaviors. These matching questions lent themselves to analyzing the data from a social norms perspective. This section will look at frequency of student engagement in the above behaviors as well as perception of the typical student's level of engagement in these behaviors. In addition, correlations between each behavior and the typical student in the same behavior will be examined. All three variables showed that what students did and what they perceived the typical student did were very different. For instance, whereas, 25.9% of students never used a condom, only 0.6% of the total sample perceived that their peers never used condoms. A similar observation was made for those that always used condoms (35.9% versus 3.7%). This misperception has been observed previously in the literature. Scholly et al. (2005) noted that in the sample of college students they studied students underestimated condom use in their peers. The results from the present study, as well as Scholly et al., are examples of pluralistic ignorance (Chia & Gunther, 2006); where the majority has a false perception of what others are doing, in this case using condoms less than they are.

The same trend was seen for number of sexual partners in the present study. Overall, 93.1% of the total sample had had 0-1 partners in the past year whereas 10.2% of the total sample perceived that the typical student had this number of sexual partners in the past year. Several other authors saw this tendency as well (American College Health

Association, 2005; Martens et al., 2006; Scholly et al., 2005). The ACHA report found that 74.1% of students reported having 0-1 partners, whereas only 14.3% of students thought the typical student had just 0-1 partners. Martens et al. reported that the mean number of sexual partners was 2.55 whereas for the typical student this was 4.79. Scholly et al. found similar results in that 80% of students reported having 0-1 partner in the past year versus 22% of students that perceived this was the case for the typical student. The reports above are also examples of pluralistic ignorance. It seems that this type of misperception is common in college students with regard to sexual behavior as this was also seen for perceptions of vaginal intercourse.

There were discrepancies for vaginal intercourse frequency between students and the typical student. This study found that 29.3% students had never had vaginal intercourse, and 21.9% had not had vaginal intercourse in the past month. However, only 2.4% of the sample thought the typical student had not had vaginal intercourse in the past month. The ACHA-NCHA question about the typical student did not have a “never had vaginal intercourse” option for the typical student. These results are consistent with previous literature on this topic (American College Health Association, 2005; Martens et al., 2006; Page et al., 2000). The ACHA-NCHA 2003 reference group, for instance, reported that while 49.1% of students reported having vaginal intercourse one or more times in the past month, 96.8% of students believed the average student had vaginal intercourse one or more times in the past month. Martens et al. found that those students that reported more intercourse also perceived this to be the norm of the typical student. One interesting finding from the present study was that while 14.1% of the total sample

reported they had had sex ≥ 11 times in the past month, only 6.5% thought that the typical student had had vaginal intercourse ≥ 11 times. Therefore in this study students underestimated frequency of vaginal intercourse at the high end and overestimated frequency of vaginal intercourse at the low end of the spectrum in their peers. This study also examined whether or not there were correlations between students' sexual behaviors and their perception of their peers' sexual behaviors.

Correlations between condom use, number of sexual partners, vaginal intercourse frequency, and the typical student's engagement in these behaviors revealed that number of sexual partners and vaginal intercourse were positively correlated while condom use was only significantly correlated in females. These results indicate that those students that had more sexual partners and vaginal intercourse more often also perceived this to be true of their peers. Page et al. (2000) found this to be the case as well in their investigation of engagers and non-engagers with regard to vaginal intercourse. Page et al. found that more females than males were engaging in vaginal intercourse, but the belief was just the opposite (that more males than females were having sex). This reasoning, for this study as well as Page et al., follows Berkowitz's (2004) idea of a false consensus; meaning that students perceive their behavior to be the norm, or the majority, when in fact it is the minority. Whitley (1998) found similar results in females and used false consensus to explain that those females that had had sex more often also expected that this was true of their peers. Whitley went further to discover that those participants that overestimated the frequency of sexual intercourse in their peers did so because of selective exposure. Selective exposure states in this case that those students that had more

friends that were sexually active also predicted this to be the norm when in fact it was not. This study also found differences between males and females with regard to social norms theory and sexual behaviors.

There was a small negative correlation between condom use and the typical student condom use in females. This result indicates that those females, for instance, that did not use condoms regularly perceived that their peers did use condoms regularly. The implication of this result is unclear. Perhaps these females relied on other forms of birth control and underestimated the amount to which others did so as well. In this example these females exhibited false uniqueness, where these individuals believe they are more unique than they are (Berkowitz, 2004).

The connotation of these findings on social norms theory and sexual behavior are compounded by the results on sexual behaviors and perceived health. It appears that some students are influenced by what they perceive their peers to be doing with regard to number of sexual partners and frequency of vaginal intercourse, as well as condom use in females. Students are also not taking their sexual behaviors into account when self-assessing their health. Thus, it seems that protective sexual behaviors are not considered as a factor in health enhancement, and a false perception of peer behavior may have a negative, and potentially lasting, impact on student health with regard to STDs and the health ramifications due to STDs (e.g., cancer).

Of other interest were the differences between males and females on some of the sexual behavior responses. Although sexual behaviors and perceived health were not significantly correlated there were some striking differences between females and males

in condom use, number of sexual partners, and frequency of vaginal intercourse.

Therefore, education should be targeted uniquely to both genders, for it seems that they think differently about these sexual behaviors, and these belief systems may therefore drive varying, yet still unhealthy, behaviors with regard to sex.

Conclusion

The purpose of this study was to examine CSU students' exercise, nutrition, weight management, and sexual behaviors that may enhance disease prevention and those behaviors' relationship to students' perceived health. A secondary purpose of this research was to examine how students' perceptions of their peers' sexual behaviors influenced their own sexual behaviors based on social norms theory.

The results of this study indicate that students take exercise, nutrition, weight management, and weight status (measured as BMI) into account when assessing their health. At the same time most students did not meet the 2000 nutrition recommendations with respect to fruit and vegetable intake. Most students (57.6%) met the minimal weekly exercise requirements. There was a discrepancy between weight management and weight status. For instance more males than females were considered overweight or obese and more males than females were also trying to gain weight.

Students did not take sexual behaviors into account when assessing their health and there was incongruity between what students did and what they believe the typical student did with regard to sexual behavior. The implications of these findings are that students may not consider the risks of unprotected sex and numerous sexual partners in terms of their health. False consensus also came into play in that those students that

perceived the typical student to have more partners and vaginal intercourse also engaged in these behaviors more than those students that estimated less engagement of the typical student in these behaviors.

It appears from these results that students are well versed in the benefits of exercise with regard to their health. They are also knowledgeable of the benefits of good nutrition with regard to health; however, they do not practice this knowledge. Education efforts regarding nutrition may be helpful in increasing fruit and vegetable intake in this population (Kolondinsky et al., 2007). Additionally, education efforts that target females and males differently concerning weight management, weight status, and sexual behaviors are also in order. These efforts may help reduce unhealthy weight management behaviors and perceptions and help this population reduce their risk of STDs.

It should be noted that Hartshorn Health Center on the CSU campus is starting a social marketing campaign on CSU's campus regarding exercise in fall 2008. Social marketing differs from social norms campaigns. Social marketing is "an approach to seeking specified behavior in a target audience" (U.S. Department of Education, 1997, p. 1). Social marketing takes into account campus social norms and uses principles of marketing to affect change. "Social marketing uses messages and images as carefully developed as those used in commercial advertising, but for different purposes. Its strategies can popularize positive ideas and attitudes and encourage favorable changes in social values and individual behavior" (U.S. Department of Education, p. 2). A social norms campaign in contrast examines the current status of student behaviors against perceived behaviors and then displays (through posters, newspapers, talks, computer

screen savers, etcetera) this information to affect change in student behavior. The purpose is to correct student misconceptions of their peers. The efficacy of social norms campaigns is mixed (Granfield, 2005; Perkins & Craig, 2006; Thombs, Dotterer, Olds, Sharp, & Raub, 2004). Social marketing is thought to be a more effective approach to affecting change on the CSU campus than social norms campaigns (Deb Morris, Hartshorn Health Center). Therefore, it may be feasible to run social marketing campaigns on campus that utilize the data presented here and target information on healthy body weight and weight management strategies as well as healthy sexual behaviors.

Limitations

The limitations of this study are primarily associated with the research design and instrument. The ACHA-NCHA was distributed in CSU general education health classes. As most students take general education courses early in their college careers it cannot be said that the results of this research can be generalized to the college population as a whole and not even necessarily to the CSU population as whole. When the present study was compared to CSUs population it was the same in terms of white and minority students (approximately 13% minority students), but this sample was much heavier on freshmen than any other class. Whereas the CSU student population, according to data from the fall semesters of 2004, 2005, and 2006 combined were 28% freshmen, 21% sophomores, 22% juniors, and 29% seniors. The present study was comprised of 52.2% freshmen, 24.4% sophomores, 12.5% juniors, and 7.6% of seniors. While these figures make sense, as most students take general education courses in their first two years of

college, the results cannot truly be said to be representative of all students at CSU. In addition students self selected to participate in the study, another factor that may have affected student representation.

Other limitations related to the instrument. The ACHA-NCHA was an anonymous questionnaire; therefore, students could have been dishonest in their answers leading to exaggeration on some measures, for instance number of sexual partners. The questionnaire was also developed by ACHA, not the researcher. Therefore, there were questions that the researcher would have liked to expand upon but because of the format and the archival nature of the data was unable to. For instance, the question regarding exercise only referred to “vigorous” exercise. As a result students may have answered this question with formal exercise in mind and may not have taken into account moderate exercise such as walking to and from classes or campus, chores, etcetera. As well it may have been interesting to see whether there were social norms regarding exercise or other health behaviors besides sexual behaviors. The ACHA-NCHA, however, did not contain these types of questions. Finally, the study was limited to 18-25 year olds, eliminating several subjects from the data set. By omitting these data the overall results may have been different than if those data were included.

These limitations may have an impact on the applicability of the information presented here. For example, a social marketing campaign may only be applicable to freshmen and sophomore students and less applicable to juniors and seniors.

Recommendations

The recommendations for future research relate to grouping questions, research methods, and potential applicability of the data. During the data analysis portion of this study certain questions arose that would have been interesting to investigate but due to the limited nature of this project could not be examined. For instance in the future examining the sexual behaviors in more detail would be of interest. Specifically, examining whether or not having been diagnosed with an STD had an impact on the correlations between sexual behaviors and perceived health would be of interest.

Cason and Wenrich (2002) performed a mixed method study that examined student behaviors quantitatively and also qualitatively. It would be interesting, especially if developing social marketing campaigns, to gather focus groups of students to understand the interactions between variables better. This approach may also help apply the results more effectively by having direct student input.

Other researchers (Huang et al., 2003, Racette et al., 2005) have examined weight changes over the course of college. This study did not examine differences between students, by age or school year, and their incidence of overweight and obesity. Additionally, other studies not only looked at differences in exercise participation between genders (George, 2000) but also how these factors changed with age (Huang et al.). These differences would be interesting to examine to help verify, or not, that students become less healthy as they age (as seen in the data on overweight and obesity between children and adults).

The following recommendations relate to how one could specifically use the information presented here. This study indicated that females and males have different perceptions of their body weight. In addition, more students (specifically females) were trying to lose weight than were overweight, most students did not eat the recommended amount of fruits and vegetables, and approximately only half of students met the recommendations for exercise. At the same time, currently in the United States, more people are overweight than are a healthy body weight, over 100 billion dollars is spent each year on obesity related diseases, and billions are spent by consumers on weight loss products. There seems to be an extreme disconnect between what people think is healthy and how to achieve good health with regard to weight, nutrition, and exercise. There is no secret to achieving and maintaining a healthy body weight. A sensible diet and moderate exercise alone are enough to achieve a healthy body weight for most people. It seems the two factors most people have going against them are misinformation and the way health is marketed. This misinformation can largely be blamed on media and marketing. One way health is marketed is through food products. Good nutrition is important for good health but because of the way most food is sold (packaged for instance) what “good food” is can be confused. The best way to achieve good health through food is to pick fresh, unprocessed, foods; and to not overeat.

One just has to go to the grocery store to be bombarded by copious amounts of confusing information. If one walks down the grocery aisles he or she will see a lot of information on nutrition. Many products are marketed as “healthy”, “lite”, “a good source of” this or that. Without a solid understanding of nutrition the claims one sees on the box

may sound good, but in the processing and preserving of much food a lot of nutrients are lost, or unhealthy ingredients (like sodium and sugar) are added. Because nutrition seems to be confused what is not made clear is that for less money, and greater nutritional value, that person could get all those nutrients if he or she went back to the produce section and stayed on the perimeter of the store where the fresh food is sold.

The last part with regard to the grocery store/misinformation dilemma example occurs when one checks out. At the check-out one is bombarded with images and information, which if not consumed critically, could lead to more confusion. Even magazines that are sold as sources of health information seem to be selling primarily weight loss, thinness, six pack abs, etc. The women on the covers are typically thin and airbrushed; the men are muscular and tan. The problem with this is that not only are these images sold as the ideal, but they also imply that the potential consumer could and should achieve a similar physique, but at the same time the information on how to do that is lacking or incorrect.

The solutions to the problems stated above are not clear. One piece may be that when teaching about body weight and nutrition, as well as exercise, practitioners should teach others to be critical consumers of information. A level cynicism and a realistic view of not only information but also of one's self are called for. For instance, not only should one believe that quick fixes to weight, nutrition, or exercise problems are not realistic, but also one should see his or herself through a clear lens. In other words most people will never look like a super model because of genetics and therefore should attempt to be healthy in their own right. A concrete example of how to do this is to go to the grocery

store and cook healthy meals with students. A weight management, weight perception lesson may consist of viewing images, such as magazine covers and ads, and having a critical discussion of the messages those ads send. This study found that females and males have different perceptions of their weight; thus part of this discussion may entail revealing what the opposite sex really believes about body weight and physique of themselves and others. Finally, the exercise piece should consist of removing the idea that exercise can only be achieved in a formal way (such as going to the gym) and that it requires a lot of time, equipment, and training. Students should be taught that by doing something as simple as walking or riding a bike instead of driving can in many cases “take care” of their exercise needs for the day.

This study also found that students do not take protective sexual behaviors into account when assessing their health, students have misperceptions about their peers’ sexual behaviors, and that females protect themselves less often (via condom use) than males. It is understandable that the social norms around sexual behaviors are incorrect. Whereas alcohol use may be very public, people see each other drinking, and they talk about it, sex is not as public. Sex is inherently a private act between two people. And culturally there is not typically an open dialog about sex or the behaviors surrounding it (e.g., condom use, and number of sexual partners). It is understandable that there is a lot of misinformation surrounding sex. In addition, the expectations that students may have when they go to college may contribute not only to this misinformation, but also to potential risky behavior. Students may perceive that when they go to college not only are they supposed to drink a lot, but they are also supposed to have sex, perhaps with great

frequency, or for the first time. These misperceptions may account for why in this study students thought that the typical student was more sexually active, and had more sexual partners, than was really the case. They may have also thought that students were using condoms more than they actually were because of the perception that they were more sexually active than they actually were.

Classroom, or campus, solutions to these issues seem again (as with weight perception) to create an open dialog for students. A part of this dialog should be teaching students how to communicate with each other about sex. This communication should include how to talk to a potential partner about contraceptives, and STD protection. Because females and males may have different expectations of each other with regard to sex and protection another part of this dialog should focus on this and how to deal with it.

Education is often focused on providing facts and less on how to interpret and use those facts. Students need to be given the tools to take care of themselves and be critical consumers of information.

References

- American College of Sports Medicine's Guidelines for Exercise Testing and Prescription (7th ed.). (2006). Philadelphia, PA: Lippincott Williams & Wilkins.
- American College Health Association. Healthy Campus 2010, Baltimore, MD: May 2002.
- American College Health Association (2005). The American college health association national college health assessment (ACHA-NCHA), spring 2003 reference group report. *Journal of American College Health*, 53, 199-210.
- American College Health Association (2004). National college health assessment ACHA-NCHA reliability and validity analyses. Baltimore, MD.
- Anding, J. D., Suminski, R. R., & Boss, L. (2001). Dietary intake, body mass index, exercise, and alcohol: Are college women following the dietary guidelines for Americans? *Journal of American College Health*, 49, 167-171.
- Babbie, E. (1990). *Survey research methods*. (2nd ed.). Belmont, CA: Wadsworth Publishing Company.
- Babbie, E. (2004). *The practice of social research*. (10th ed.). Belmont, CA: Thompson Wadsworth.
- Berkowitz, A. D. (2004). *Social norms approach: Theory, research, and annotated bibliography*. Retrieved May 29, 2007 from <http://www.higheredcenter.org/socialnorms/>.
- Brown, J. L., & Vanable, P. A. (2007). Alcohol use, partner type, and risky sexual behavior among college students: Findings from an event-level study. *Addictive Behaviors*, 32, 2940-2952.
- Buunk, B. P., Van Den Eunden, R. J. J. M., & Siero, F. W. (2002). The double-edged sword of providing information about the prevalence of safer sex. *Journal of Applied Social Psychology*, 32, 684-699.
- Carter, J. A., McNair, L. D., Corbin, W. R., & Williams, M. (1999). Gender differences related to heterosexual condom use: The influence of negotiation styles. *Journal of Sex and Marital Therapy*, 25, 217-225.

- Cason, K. L., & Wenrich, T. R. (2002). Health and nutrition beliefs, attitudes, and practices of undergraduate college students: A needs assessment. *Topics in Clinical Nutrition, 17*, 52-70.
- Caspersen, C. J., Pereira, M.; A., & Curran, K. M. (2000). Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Medicine and Science in Sports and Exercise, 32*, 1601-1609.
- Chia, S. C., & Gunther, A. C. (2006). How media contribute to misperceptions of social norms about sex. *Mass Communication and Society, 9*, 301-320.
- Centers for Disease Control and Prevention. (2006). *STD surveillance 2005: Trends in reportable sexually transmitted diseases in the United States, 2005*. Retrieved May 29, 2007 from <http://www.cdc.gov/std/stats/05pdf/trends-2005.pdf>.
- Centers for Disease Control and Prevention. (2007a). *Defining Overweight and Obesity*. Retrieved August 30, 2007 from <http://www.cdc.gov/nccdphp/dnpa/obesity/defining.htm>.
- Centers for Disease Control and Prevention. (2007b). *U.S. Obesity Trends 1985–2006*. Retrieved October 17, 2007 from <http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/index.htm>
- Centers for Disease Control and Prevention. (2008a). *Behavioral Risk Factor Surveillance System: Prevalence Data: Exercise – 2006*. Retrieved February 25, 2008 from <http://apps.nccd.cdc.gov/brfss/list.asp?cat=EX&yr=2006&qkey=4347&state=WA>
- Centers for Disease Control and Prevention. (2008b). *Heart Disease*. Retrieved February 25, 2008 from <http://www.cdc.gov/heartdisease/>
- Clinical Guidelines for the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: Executive Summary (1998). *The American Journal of Clinical Nutrition, 68*, 899-917.
- Colditz, G. A. (1999). Economic costs of obesity and inactivity. *Medicine and Science in Sports and Exercise, 31*, (Suppl), 663-667.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

- Cohen, L. J., & Shotland, R. L. (1996). Timing of first sexual intercourse in a relationship: Expectations, experiences, and perceptions of others. *The Journal of Sex Research, 33*, 291-299.
- Connell, C. L., Simmerman, K. B., Stewart, J. E., Foy, J. E., & Nettles, M. F. (2005). Assessment of college students' eating and exercise habits, barriers toward behavior change regarding physical activity, and perceptions of weight status. *Journal of the American Dietetic Association, 105*, (Suppl 1), 20.
- Creswell, J. W. (2003). *Research design qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage Publications, Incorporated.
- Douglas, K. A., & Collins, J. L. (1997). Results from the 1995 national college risk behavior survey. *Journal of American College Health, 46*, 55-66.
- Eng, T. R., & Butler, W. T. (Eds.). (1997). *The hidden epidemic: Confronting sexually transmitted diseases*. Washington, DC: Institute of Medicine.
- Finkelstein, E. A, Fiebelkorn, I. C., & Wang, G. (2004). State-level estimates of annual medical expenditures attributable to obesity. *Obesity research, 12*, 18-24.
- George, V. (2000). Assessing physical activity in college students in reference to the new recommendations for physical activity [Abstract]. *Measurement in Physical Education & Exercise Science, 4*, 128.
- Gliner, J. A. & Morgan, G. A. (2000). *Research methods in applied settings: An integrated approach to design and analysis*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Granfield, R. (2005). Alcohol use in college: Limitations on the transformation of social norms. *Addiction Research and Theory, 13*, 281-292.
- Haberman, S., & Luffey, D. (1998). Weighing in college students' diet and exercise behaviors. *Journal of American College Health, 46*, 189-192.
- Hargrove, H. J., & Keller, C. (1993). Young black women: Defining health. *Journal of National Black Nurses' Association, 6*, 3-14.
- Hoffman, D. J., Policastro, P., Quick, V., & Lee, S., (2006). Changes in body weight and fat mass of men and women in the first year of college: A study of the "freshman 15". *Journal of American College Health, 55*, 41-45.
- Hoeger, W. W. K., & Hoeger, S. A. (2006) (9th ed.). *Principles and labs for fitness and wellness*. Belmont, CA: Thompson Wadsworth.

- Huang, T. T. K., Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing overweight, obesity, diet, and physical activity in college students. *Journal of American College Health, 52*, 83-86.
- Irwin, J. D. (2007). The prevalence of physical activity maintenance in a sample of university students: A longitudinal study. *Journal of American College Health, 56*, 37-41.
- Kolodinsky, J., Harvey-Bernio, J. R., Berlin, L., Johnson, R. K., & Reynolds, T. W. (2007). Knowledge of current dietary guidelines and food choice by college students: Better eaters have higher knowledge of dietary guidance. *Journal of the American Dietetic Association, 107*, 1409-1413.
- Martens, M. P., J. C., Mowry, E. S., Damann, K. M., Taylor, K. K., & Cimini M. D. (2006). Differences between actual and perceived student norms: An examination of alcohol use, drug use, and sexual behavior. *Journal of American College Health, 54*, 295-300.
- Merriam, S. B. (2002). *Qualitative research in practice*. San Francisco: Jossey-Bass.
- Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991-1998. *Journal of the American Medical Association, 282*, 1519-1522.
- Morgan, G. A., Gliner, J. A., & Harmon, R. J. (2006). *Understanding and evaluating research in applied and clinical settings*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Morgan, G. A., Leech, N. L., Gloeckner, G. W. & Barrett, K. C. (2004). *SPSS for introductory statistics use and interpretation* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- MyPyramid.gov-United States Department of Agriculture. (2005). *Dietary guidelines for Americans, 2005*. Retrieved May 29, 2007 from <http://health.gov/dietaryguidelines/dga2005/document/html/chapter5.htm>.
- National Center for Health Statistics. (2007). *Prevalence of overweight and obesity among adults: United States, 2003-2004*. Retrieved May 25, 2007 from http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght_adult_03.htm.

- National Center for Health Statistics. (2007). *Prevalence of overweight among children and adolescents: United States, 2003-2004*. Retrieved May 25, 2007 from http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght_child_03.htm.
- Page, R. M., Hammermeister, J. J. & Scanlan, A. (2000). Everybody's not doing it: Misperceptions of college student's sexual activity. *American Journal of Health Behavior, 24*, 387-394.
- Pallant, J. (2007). *SPSS Survival Manual*. (3rd ed.). Berkshire, England: McGraw Hill Open University Press.
- Pate, R., Pratt, M., Blair, S., Haskell, W., Macera, C., Bouchard, C., et al. (1995). Physical activity and public health: A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of the American Medical Association, 273*, 402-407.
- Payne, G. V., & Isaacs, L. D. (2005). *Human motor development: A lifespan approach*. (6th ed.). New York: McGraw Hill Higher Education.
- Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions, 21*, 961-976.
- Perkins, H. W., & Craig, D. W. (2006). A successful social norms campaign to reduce alcohol misuse among college athletes. *Journal of Studies on Alcohol, 67*, 880-889.
- Pinto, B. M., Cherico, N. P., Szymanski, L., & Marcus, B. H. (1998). Longitudinal changes in college students' exercise participation. *Journal of American College Health, 47*, 23-27.
- Racette, S. B., Deusinger, S. S., Strube, M. J., Highstein, G. R., & Deusinger, R. H. (2005). Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *Journal of American College Health, 53*, 245-251.
- Racette, S. B., Deusinger, S. S., Strube, M. J., Highstein, G. R., & Deusinger, R. H. (2008). Changes in weight and health behaviors from freshman through senior year of college. *Journal of Nutrition Education and Behavior, 40*, 39-42.
- Randall, N. B., Han, J. L., Dinger, M. K., Heesch, K. C., Fields, D. A., & Knehans, A. W. (2007). Changes in women's physical activity over their freshman year. *American Journal of Health Studies, 22*, 42-45.

- Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley & Sons, Inc.
- Scholly, K., Katz, A. R., Gascoigne, J., Holck, P. S. (2005). Using social norms theory to explain perceptions and sexual health behaviors of undergraduate college students: An exploratory study. *Journal of American College Health, 52*, 159-166.
- Smith, L. A. (2003). Partner influence on noncondom use: Gender and ethnic differences. *Journal of Sex Research, 40*, 346-350.
- Thombs, D. L., Dotterer, S., Olds, S., Sharp, K. E., & Raub C. G. (2004). A close look at why one social norms campaign did not reduce student drinking. *Journal of American College Health, 53*, 61-68.
- Thompson, S. C., Kyle, D., Swan, J., Thomas, C., & Vrungos, S. (2002). Increasing condom use by undermining perceived invulnerability to HIV. *AIDS Education and Prevention, 14*, 505-514.
- Tulloch, H. E., McCaul, K. D., Miltenberger, R. G., & Smyth, J., M. (2004). Partner communication skills and condom use among college couples. *Journal of American College Health, 52*, 263-267.
- U.S. Department of Education. (1997). *Social Strategies for Campus Prevention of Alcohol and Other Drug Problems* (DE Publication No. ED 415-786). Washington, DC: U.S. Government Printing Office.
- U.S. Department of Health and Human Services (1996). *Physical activity and health: a report of the Surgeon General*. Washington, DC: US Government Printing Office.
- U.S. Department of Health and Human Services. (2000). *Healthy people 2010. 2nd ed. Understanding and improving health. Leading health indicators: Overweight and obesity objectives*. Washington, DC: US Government Printing Office.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010. 2nd ed. Objectives for improving health: Overweight and obesity*. Washington, DC: US Government Printing Office.
- U.S. Department of Health and Human Services. (2005). *Dietary Guidelines for Americans*. Retrieved August 30, 2007 from www.healthierus.gov/dietaryguidelines.
- Volicer, B. J., Quattrocchi, N., Candelieri, R., & Nicolosi, R. (2003). Health and weight perceptions of obese students. *The Nurse Practitioner, 28*, 13-14.

Whitley, B. E. Jr. (1998). False consensus on sexual behavior among college women: comparison of four theoretical explanations. *The Journal of Sex Research*, 35, 206-214.

Williams, M. H. (2007). *Nutrition for health, fitness, & sport*. New York: McGraw-Hill.

World Health Organization. (2007). *Frequently Asked Questions*. Retrieved September 10, 2007 from <http://www.who.int/suggestions/fac/en/>.

Appendix A

American College Health Association-National College Health Assessment

American College Health Association

National College Health Assessment

Instructions:

The following questions ask about various aspects of your health.

To answer the questions, fill in the oval that corresponds to your response.

Select only one response unless instructed otherwise.

Use a No. 2 pencil or blue or black ink pen only. Do not use pens with ink that soaks through the paper. CORRECT: ● INCORRECT: ☒ ✕ ○ ◉

This survey is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you are not comfortable in answering.

This survey is completely anonymous. Please make no marks of any kind on the survey which could identify you individually.

Composite data will then be shared with your campus for use in health promotion activities.

**Thank you for taking the time and
thought to complete this survey.
We appreciate your participation!**

Copyright © 2003 American College Health Association



PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

The first 8 questions ask about health, health education, and safety.

1. Considering your age, how would you describe your general health?

- Excellent Very good Good Fair Poor Don't know

2. On which of the following health topics have you ever received information from your college or university?

(Select all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Tobacco use prevention | <input type="checkbox"/> Pregnancy prevention |
| <input type="checkbox"/> Alcohol and other drug use prevention | <input type="checkbox"/> AIDS or HIV infection prevention |
| <input type="checkbox"/> Sexual assault/relationship violence prevention | <input type="checkbox"/> Sexually transmitted disease (STD) prevention |
| <input type="checkbox"/> Violence prevention | <input type="checkbox"/> Dietary behaviors and nutrition |
| <input type="checkbox"/> Injury prevention and safety | <input type="checkbox"/> Physical activity and fitness |
| <input type="checkbox"/> Suicide prevention | <input type="checkbox"/> None of the above |

3. Check the circle below to record how BELIEVABLE you find each source of health information.

4. Do you usually get health-related information from any of the following sources?

	Believable	Neither Believable nor Unbelievable	Unbelievable	No	Yes
(Please mark the best response for each question to the right)					
Leaflets, pamphlets, flyers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Campus newspaper articles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health center medical staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health educators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resident assistants/advisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious counselor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Campus peer educators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faculty/coursework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet/world wide web	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Within the last school year, how often did you:

(Please mark the appropriate column for each row)

- Always
Most of the time
Sometimes
Rarely
Never
N/A didn't do this within the last school year

Wear a seatbelt when you rode in a car?	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you rode a bicycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you rode a motorcycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wear a helmet when you were inline skating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Within the last school year, were you:

- in a physical fight? Yes No
Physically assaulted (do not include sexual assault)? Yes No

14. In the last two weeks, on how many occasions did you drink the same or more alcohol as indicated in item #13? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

T
I
M
E
S

00	01
02	03
04	05
06	07
08	09
10	11
12	13
14	15
16	17
18	19
20	21

15. How many alcoholic drinks do you think the typical student at your school had the last time he/she "partied"/socialized? (If less than 10, code answers as 00, 01, 02, etc.)

D
R
I
N
K
S

00	01
02	03
04	05
06	07
08	09
10	11
12	13
14	15
16	17
18	19
20	21

16. Think back over the last two weeks. How many times, if any, have you had five or more alcoholic drinks at a sitting?

- None
 1 time
 2 times
 3 times
 4 times
 5 times
 6 times
 7 times
 8 or more times

(Please mark the appropriate column for each row)

17. During the last school year, if you "partied"/socialized, how often did you...

Usually Always Sometimes Rarely Never
 Not applicable/Don't drink

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Alternate non-alcoholic with alcoholic beverages | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Determine, in advance, not to exceed a set number of drinks | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Choose not to drink alcohol | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Use a designated driver | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Eat before and/or during drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Have a friend let you know when you've had enough | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Keep track of how many drinks you were having | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pace your drinks to 1 or fewer per hour | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Avoid drinking games | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Drink an alcohol look-alike (non-alcoholic beer, punch, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

(Please mark the appropriate column for each row)

18. If you drink alcohol, within the last school year, have you experienced any of the following as a consequence of your drinking?

Yes No
 Not applicable/Don't drink

- | | | | |
|---|-----------------------|-----------------------|-----------------------|
| Physically injured yourself | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Physically injured another person | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Been involved in a fight | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Did something you later regretted | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Forgot what you were or what you did | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Had someone use force or threat of force to have sex with you | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Had unprotected sex | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

19. Within the last 30 days, what percent of students at your school used? State your best estimate.

% Used Cigarettes	% Used Alcohol	% Used Rationed or GHS
00	00	00
01	01	01
02	02	02
03	03	03
04	04	04
05	05	05
06	06	06
07	07	07
08	08	08
09	09	09
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20

(Please mark the appropriate column for each row)

	No	Yes
	Never did this sexual activity	Don't know/Don't remember
27. If you are sexually active, did you use a condom the last time you had:		
Oral sex?	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>

28. If you have had vaginal intercourse, what method did you or your partner use to prevent pregnancy the last time? (Select all that apply)

<input type="checkbox"/> Have not had vaginal intercourse	<input type="checkbox"/> Spermicide (e.g. foam)
<input type="checkbox"/> Birth control pills	<input type="checkbox"/> Fertility awareness (calendar, mucous, basal body temperature)
<input type="checkbox"/> Depo-Provera (shots)	<input type="checkbox"/> Withdrawal
<input type="checkbox"/> Norplant (implant)	<input type="checkbox"/> Other method
<input type="checkbox"/> Condoms (male or female)	<input type="checkbox"/> Nothing
<input type="checkbox"/> Diaphragm/Cervical cap/Sponge	

29. Within the last school year, if you are sexually active, have you or your partner(s) used emergency contraception ("morning after pill")?

No Yes Don't know Not sexually active

30. Within the last school year, have you unintentionally become pregnant or gotten someone else pregnant?

Have not had vaginal intercourse within the last school year No

Yes Don't know

31. Have you ever been tested for HIV infection?

No Yes Don't know

32. Which of the following best describes you?

Heterosexual Bisexual Unsure

Gay/Lesbian Transgendered

33. If you have a credit card(s) how much total credit card debt did you carry last month? That is, what was the total unpaid balance on all of your credit cards (that you are responsible for paying)?

<input type="radio"/> None, I don't have any credit cards and am responsible for paying	<input type="radio"/> \$1 - \$99	<input type="radio"/> \$2,000 - \$2,999
<input type="radio"/> \$100 - \$299	<input type="radio"/> \$300 - \$499	<input type="radio"/> \$5,000 - \$5,999
<input type="radio"/> \$500 - \$999	<input type="radio"/> \$1,000 - \$1,999	<input type="radio"/> \$4,000 - \$4,999
<input type="radio"/> \$1,000 - \$1,999	<input type="radio"/> \$3,000 - \$3,999	<input type="radio"/> \$5,000 - \$5,999
<input type="radio"/> \$2,000 - \$2,999	<input type="radio"/> \$4,000 or more	<input type="radio"/> \$6,000 or more

34. What is your approximate cumulative grade average?

A B C D/F NA

The next 5 questions ask about weight, nutrition, and exercise.

35. How do you describe your weight?

Very underweight Slightly overweight

Slightly underweight Very overweight

About the right weight

36. Are you trying to do any of the following about your weight?

I am not trying to do anything about my weight Lose weight

Stay the same weight Gain weight

37. Within the last 30 days, did you do any of the following? (Select all that apply)

Exercise to lose weight

Diet to lose weight

Vomit or take laxatives to lose weight

Take diet pills to lose weight

I didn't do any of the above

38. How many servings of fruits and vegetables do you usually have per day (1 serving = 1 medium piece of fruit, 1/2 cup chopped, cooked or canned fruits/vegetables, 3/4 cup fruit/vegetable juice, small bowl of salad greens, or 1/2 cup dried fruit)?

I don't eat fruits and vegetables

1-2

3-4

5 or more

(Please mark the appropriate column for each row)

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
39. On how many of the past 7 days did you:								
Participate in vigorous exercise for at least 20 minutes or moderate exercise for at least 30 minutes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Got enough sleep so that you felt rested when you woke up in the morning?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3/8" spine part

(Please mark the appropriate column for each row)

40. Within the last school year how many times have you:

5-6 times 7-8 times
3-4 times 9-10 times
1-2 times 11 or more times
Never

- Felt things were hopeless
- Felt overwhelmed by all you had to do
- Felt exhausted (not from physical activity)
- Felt very sad
- Felt as if pressed that it was difficult to function
- Seriously considered strangling suicide
- Attempted suicide

41. Have you ever been diagnosed with depression?

Yes No

(If you responded "no," please go to question 42)

Yes
No

If Yes: Have you been diagnosed with depression within the last school year?

Are you currently in therapy for depression?

Are you currently taking medication for depression?

Yes
No
Yes
No

(Please mark the appropriate column for each row)

42. Have you:

Don't Know
Yes
No

Don't Know
Yes
No

- Been vaccinated against hepatitis B? (Females, performed breast exam exam in the last year?)
- Been vaccinated against meningococcal disease (meningococcal meningitis)? (Females had a routine gynecological exam in the last year?)
- Been vaccinated against varicella (chicken pox)?
- Been vaccinated with measles, mumps, rubella (2 shots)?
- Been vaccinated against influenza (the flu) in the last year?
- Had a dental exam and cleaning in the last year?
- (Males) Performed testicular self exam in the last year?
- Had your blood pressure checked in the last 2 years?
- Had your cholesterol checked in the last 5 years?
- Used sunscreen daily?

Have you ever been diagnosed with any of the following? Yes No

Have you ever been diagnosed with any of the following? Yes No

Within the last school year, have you had any of the following? Yes No

Within the last school year, have you had any of the following? Yes No

43. (Please make two marks in the appropriate columns for each row)

- Allergy problems
- Anorexia
- Anxiety Disorder
- Asthma
- Bulimia
- Chronic Fatigue Syndrome
- Depression
- Diabetes
- Endometriosis
- Genital herpes
- Genital warts/HPV
- Hepatitis B or C
- High blood pressure
- High cholesterol
- Head infection
- Repetitive stress injury (e.g. carpal tunnel syndrome)
- Seasonal Affective Disorder
- Substance abuse problem
- Back pain
- Broken bone/fracture
- Bronchitis
- Chlamydia
- Ear infection
- Gonorrhea
- Mononucleosis
- Pelvic Inflammatory Disease
- Sinus infection
- Strep throat
- Tuberculosis

EXPERIMENT

The next question asks about impediments to academic performance.

Received an incomplete or dropped the course
 Received a lower grade in the course
 Received a lower grade on an exam or important project
 I have experienced this issue but my academics have not been affected
 This did not happen to me/not applicable

44. Within the last school year, have any of the following affected your academic performance? (Please select the most serious outcome for each item below)
- Alcohol use
 - Allergies
 - Assault (physical)
 - Assault (sexual)
 - Attention Deficit Disorder
 - Cold/Flu/Sore throat
 - Concern for a troubled friend or family member
 - Chronic illness (diabetes, asthma, etc.)
 - Chronic pain
 - Death of a friend or family member
 - Depression/Anxiety Disorder
 - Seasonal Affective Disorder
 - Drug use
 - Eating disorder/problem
 - HIV infection
 - Injury
 - Internet use/computer games
 - Learning disability
 - Mononucleosis
 - Pregnancy (yours or your partner's)
 - Relationship difficulty
 - Sexually transmitted disease
 - Sinus infection/ear infection/bronchitis/strep throat
 - Sleep difficulties
 - Stress
 - Other

The next question asks about your height and weight.

45. How old are you? Years
46. What is your sex?
 Female
 Male
47. What is your height in feet and inches?
- | Ft. | Inch | Years |
|-----|------|-------|
| 1 | 1 | 17 |
| 1 | 2 | 18 |
| 1 | 3 | 19 |
| 1 | 4 | 20 |
| 1 | 5 | 21 |
| 1 | 6 | 22 |
| 1 | 7 | 23 |
| 1 | 8 | 24 |
| 1 | 9 | 25 |
| 1 | 10 | 26 |
| 1 | 11 | 27 |
| 2 | 1 | 28 |
| 2 | 2 | 29 |
| 2 | 3 | 30 |
| 2 | 4 | 31 |
| 2 | 5 | 32 |
| 2 | 6 | 33 |
| 2 | 7 | 34 |
| 2 | 8 | 35 |
| 2 | 9 | 36 |
| 2 | 10 | 37 |
| 2 | 11 | 38 |
| 3 | 1 | 39 |
| 3 | 2 | 40 |
| 3 | 3 | 41 |
| 3 | 4 | 42 |
| 3 | 5 | 43 |
| 3 | 6 | 44 |
| 3 | 7 | 45 |
| 3 | 8 | 46 |
| 3 | 9 | 47 |
| 3 | 10 | 48 |
| 3 | 11 | 49 |
| 4 | 1 | 50 |
| 4 | 2 | 51 |
| 4 | 3 | 52 |
| 4 | 4 | 53 |
| 4 | 5 | 54 |
| 4 | 6 | 55 |
| 4 | 7 | 56 |
| 4 | 8 | 57 |
| 4 | 9 | 58 |
| 4 | 10 | 59 |
| 4 | 11 | 60 |

48. What is your weight in pounds?
- | Pounds |
|--------|
| 100 |
| 110 |
| 120 |
| 130 |
| 140 |
| 150 |
| 160 |
| 170 |
| 180 |
| 190 |
| 200 |
| 210 |
| 220 |
| 230 |
| 240 |
| 250 |
| 260 |
| 270 |
| 280 |
| 290 |
| 300 |
| 310 |
| 320 |
| 330 |
| 340 |
| 350 |
| 360 |
| 370 |
| 380 |
| 390 |
| 400 |
| 410 |
| 420 |
| 430 |
| 440 |
| 450 |
| 460 |
| 470 |
| 480 |
| 490 |
| 500 |
49. Year in school:
 1st year undergraduate
 2nd year undergraduate
 3rd year undergraduate
 4th year undergraduate
 5th year or more undergraduate
 Graduate coursework
 All completed
 Other
50. Are you a full-time student?
 Yes No
51. How do you usually describe yourself? (Mark all that apply)
 White (not Hispanic or Latino)
 Black (not Hispanic)
 Hispanic or Latino
 Asian or Pacific Islander
 American Indian or Alaska Native
 Other
52. Are you an international student? Yes No
53. What is your current relationship status?
 Single Separated
 Married/Partner Divorced
 Engaged/committed dating relationship Widowed
54. Where do you currently live?
 Campus residence hall Off-campus housing
 Fraternity or sorority house Parent/guardian home
 Other university/college housing Other
55. Are you a member of a social fraternity or sorority? (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)
 Yes No
56. How many hours a week do you work for pay?
 0 hours 33-39 hours
 1-9 hours 40 hours
 10-19 hours more than 40 hours
 20-29 hours
57. How many hours a week do you volunteer?
 0 hours 30-39 hours
 1-9 hours 40 hours
 10-19 hours more than 40 hours
 20-29 hours
58. Do you have any kind of health insurance (including prepaid plans such as HMOs - health maintenance organizations)?
 Yes No Not sure

THANK YOU FOR COMPLETING THIS SURVEY

THANK YOU FOR COMPLETING THIS SURVEY

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #