

Relationship between Perceived Stress and
Depression in College Students

by

Katherine Skipworth

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Approved April 2011 by the
Graduate Supervisory Committee:

Pamela Swan, Chair
Larry Woodruff
Karen Moses

ARIZONA STATE UNIVERSITY

May 2011

ABSTRACT

Other studies have previously demonstrated that perceived stress and maladaptive stress management can lead to harmful outcomes including depression, morbidity, and mortality. College students (especially freshmen) have more difficulty dealing with stress, which can increase their susceptibility to engage in high risk behaviors. The importance of conducting this research is to discover the effects that perceived stress levels may have on depression outcomes in college students, and to evaluate the influence of health related behaviors on this relationship. This study used a retrospective cross-sectional correlational design to examine correlations between perceived stress, physical activity, and other health behaviors on clinical and perceived depression in college students. A random sample of 20,000 students was drawn from 62,476 students enrolled at Arizona State University (ASU). Participants included 2,238 students who volunteered to take the American College Health Association-National College Health Assessment (ACHA-NCHA) in spring 2009. Supplemental questions for ASU students were developed by ASU Wellness and administered as a part of the ACHA-NCHA II. The university sent an invitation email, wherein students were directed through a hyperlink to the survey website. ACHA provided institutional survey data in an SPSS file for analysis. The data were evaluated with Spearman Rho Correlation Analysis and Wilcoxon-Mann-Whitney test. There were more female participants ($n = 580$) than males ($n = 483$), both averaged 23 years of age. Men had greater height, weight, and body mass index than females, all were significant mean differences. There were more significant correlations between

health factors and having perceived depression than with having real or diagnosed depression. Logistic regression showed that out of all variables and behaviors studied, only high levels of stress, poor general health, substance use, and gender (female) resulted in significant odds in predicting that a participant would be in one of the depression categories. This research suggests that addressing these factors may be important to prevent and reduce depression among college students. This study provides empirical evidence that there is a significant relationship between perceived stress and depression among college students, and that health behaviors such as substance abuse have a negative mediating effect on this relationship.

DEDICATION

This thesis is dedicated to all of the family and friends who supported and encouraged me throughout graduate school.

ACKNOWLEDGMENTS

Much appreciation goes out to the participants who dedicated their time and effort to complete the email surveys to provide data for this study. Many thanks to my committee members Larry Woodruff, Dr. Richard Hector, Karen Moses, and Dr. Pamela Swan. I would especially like to recognize Dr. Pamela Swan, committee chair, for all of her guidance, support, and patience. The direction that she provided was essential in the completion of this study. A special thanks is given to Dr. Richard Hector for all of the additional assistance and guidance on the statistical aspects of the research process. His contribution was crucial to the achievement of this research and he is just as much a part of this study as all of the members on my committee. Much appreciation is extended to Karen Moses for granting me access to the data from her project. Finally, I would like to express my gratefulness for all of the support provided by the faculty and staff of the Arizona State University Exercise and Wellness.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	viii
CHAPTER	
1 INTRODUCTION.....	1
Purposes of Study	5
Research Questions.....	5
Hypotheses	5
Definition of Terms	6
Delimitations of Study.....	7
Limitations of Study	7
2 REVIEW OF LITERATURE	9
Stress Defined and Types of Stress	9
Stress in College Students	12
Health Behaviors for Stress Management.....	17
Depression and Negative Health Outcomes	22
Positive Health Outcomes	27
Self-Efficacy	29
3 METHODOLOGY.....	33
Participants.....	33
Study Design and Procedures.....	34
Data Collection	35

CHAPTER	Page
Statistical Analysis.....	36
Study Instruments	37
4 RESULTS	38
Data Cleaning.....	38
Demographic Characteristics	39
Comparison of Mean Values.....	40
Real Depression and Health Behaviors	40
Perceived Depression and Health Behaviors.....	43
Correlation Analysis	45
Logistic Regression Analysis	47
5 DISCUSSION	49
Demographic Characteristics	49
Findings.....	51
Limitations	59
Conclusions.....	60
REFERENCES	63
APPENDIX	
A HUMAN SUBJECTS INSTITUTIONAL REVIEW APPROVAL FORM.....	68
B EMAIL RECRUITMENT LETTER	70
C AMERICAN COLLEGE HEALTH ASSOCIATION NATIONAL COLLEGE HEALTH ASSESSMENT (ACHA-NCHA)	73

CHAPTER	Page
D	ADDITIONAL QUESTIONNAIRE TO THE 2009
	ACHA-NCHA..... 86
E	LOGISTIC REGRESSION TABLES..... 92

LIST OF TABLES

Table		Page
1.	Comparison of Means of Demographic Characteristics	40
2.	Demographic Characteristics by Percentage of Males and Females..	41
3.	Comparison of Mean Values of Real Depression and Health Behaviors	42
4.	Comparison of Mean Values of Perceived Depression and Health Behaviors	44
5.	Overall Bivariate Correlations of Real Depression, Perceived Depression, and Attributing Factors.....	46

Chapter 1

INTRODUCTION

A negative cycle of stress and depression is continually problematic in society today. Stress is a contributing factor to the depression seen in the general public. Individuals feel the pressures and anxiety of stress and tend to react by performing negative health behaviors. As stressors reoccur, performing behaviors such as alcohol consumption and tobacco use can increase the rate of depression (Nonis et al., 1998; Cohen, 1996, Cohen & Herbert, 1996; Van Eck et al., 1996). This cycle between stress and depression is particularly seen in college students as a result of the perceived stress they feel during this chaotic time period. A dramatic increase in student stress is an alarming trend in college student health nationwide, as nearly 80% of students report being moderately stressed or burned out (Larson, 2006; Misra et al, 2000;). Since stress is known to have detrimental effects on the physical and mental well being of students (Hall et al., 2006; Larson, 2006; Andrews & Wilding, 2004; Nonis et al., 1998; Shapiro et al., 1998; Cohen & Herbert, 1996; Van Eck et al., 1996), intervention is needed by assessing perceived stress in college students and determining its effect on depression in order to establish ways to decrease the risk and rate of depression.

Two common types of stress are frequently mentioned in the literature. One is a negative form known as distress, which causes the body to react in a negative way and can eventually lead the body to breakdown (Le Fevre et al., 2006; Suedfeld, 1997). However the other is considered to be positive, known as eustress. This form results from challenges and motivators in daily life and tends

to encourage optimal performance which leads to success and positive self-esteem (Le Fevre et al., 2006; Suedfeld, 1997).

A third form of stress that is discussed in many studies is known as traumatic stress. Although less common than distress or eustress, traumatic stress still occurs in a large portion of society and has a greater impact on health than the other two types combined (Suedfeld, 1997). This form consists of drastically distressful events that are well beyond the normal range of daily stressors.

Traumatic events typically result in extreme mental and sometimes even physical outcomes (i.e. depression, suicidal thoughts, permanent injuries, etc.) and require counseling or hospitalization (Suedfeld, 1997).

Coping with stress may include engaging in negative health behaviors such as smoking, increased alcohol consumption, drug use, overeating and poor nutrition, physical inactivity, sleep deprivation, and increased caffeine intake (Hall et al., 2006; Nonis et al., 1998; Cohen, 1996, Cohen & Herbert, 1996; Van Eck et al., 1996). Many of these behaviors are associated with depression and possible thoughts of suicide (Andrews & Wilding, 2004; Cohen & Herbert, 1996). It has been noted that depressed people often sleep less, exercise less, have poorer diets, smoke more, and use alcohol and other drugs more often than do nondepressed persons (Cohen & Herbert, 1996). Although depression is a commonly studied topic, the effects of negative health behaviors on depression are not certain (Cohen & Herbert, 1996).

However some choose to cope with stressors by performing positive behaviors such as exercise and physical activity, addressing proper nutrition,

acquiring an adequate amount of sleep, practicing positive thinking, and possibly utilizing a form of relaxation, meditation, or spiritual method (Sloan & Bagiella, 2002; Reibel et al., 2001; Chang, 1998; Shapiro et al., 1998). When stress is managed in positive ways, healthy outcomes of mental and physical well being (i.e. reduction in body tension, improved mental clarity, and increased well-being) are possible (Sloan & Bagiella, 2002; Reibel et al., 2001; Chang, 1998; Shapiro et al., 1998).

Several forms of stress are particularly evident in college students, as this stage of life is extremely inconsistent and nerve-racking. These high levels of stress may account for college students undergoing the “university transition” (Oppenheimer, 1984). After a student graduates from high school and moves away from home, he or she is often out of the common comfort zone when moving to a new location. Stress develops during this transition as the student tries to adjust to the new situations and adapt to a new college environment (Hall et al., 2006; Andrews & Wilding, 2004; Misra & Castillo, 2004). High expectations are implied from parents and university faculty to perform well in school. There is often pressure to get a job for financial purposes. Social pressure is usually experienced while trying to fit in and make friends (especially with finding a significant other and fulfilling social obligations), as well as pressure to fit everything needing to be accomplished in the twenty four hour day, and uncertainty of the future (Larson, 2006). Learning to cope properly with distress and eustress is important, as the behaviors established in college can continue for years or even a lifetime (Oppenheimer, 1984). If behaviors and

habits resulting from stress management are maladaptive, they may have both psychologically and physiologically detrimental effects on the body and mind (Nonis et al., 1998; Cohen, 1996, Cohen & Herbert, 1996; Larson, 2006; Van Eck et al., 1996). It is important to address what influences health behaviors have on the relationship between perceived stress and depression in order to help prevent harmful health outcomes in the future (Oppenheimer, 1984).

Studies have been conducted on the effect of stress on the quality of life in college students, as well as on the sources of stress identified in this population (Marshall et al, 2008; Sreeramareddy, 2007). How stress is perceived and assessed is stated throughout the literature as well as how it affects academic outcomes in university settings. However, the literature seems to be deficient in showing how the outcomes of stress relate to negative health outcomes such as depression, in addition to the overall physiological and psychological effects that stress and coping outcomes have on the student. In particular, multiple studies address the relations between health behaviors and mood states on depression are uncertain (Taliaferro et al., 2008; Cohen & Herbert, 1996).

The importance of conducting this research in the area of stress in college students is to discover the relationship between perceived stress and depression outcomes of this population. Increased perceived stress may commonly result in carrying out repetitive negative health behaviors, potentially leading to detrimental health outcomes (i.e. depression) (Nonis et al., 1998; Cohen, 1996; Cohen & Herbert, 1996; Van Eck et al., 1996). However if a student can manage stress effectively, mental and physical well being in addition to increased self-

efficacy and a better quality of life are likely to be achieved (Sloan & Bagiella, 2002; Reibel et al., 2001; Chang, 1998; Shapiro et al., 1998; Gist & Mitchell, 1992). It is important to evaluate the effects of perceived stress to encourage students to carry out positive health behaviors as coping mechanisms for years to come.

Purposes of Study

The purpose of this cross-sectional correlation study is to determine the relationship between perceived stress and depression in college students. A secondary aim of this study is to establish what the influence of health related behaviors is on the relationship between perceived stress and depression in college students.

Research Questions

- 1) What is the relationship between perceived stress and depression in college students?
- 2) What is the influence of health related behaviors on the relationship between perceived stress and depression in college students?

Hypotheses

- 1) There will be a significant positive relationship between perceived stress and depression in college students.
- 2) The influence of health related behaviors will positively mediate the relationship between perceived stress and depression in college students.

Definition of Terms

Stress: “the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within the biological system” (Selye, 1956).

Stressor: “the cause of wear and tear” (Jones, 2001), “the source of arousal to the organism” (Robert-McComb, 2001).

Eustress: type of stress causing challenging situations, resulting in self-esteem, pride, and a greater ability to cope (Suedfeld, 1997).

Distress: type of stress leading to orgasmic breakdown (Suedfeld, 1997).

Traumatic stress: “an experience that invalidates one’s normal assumptions of order, predictability, safety, and identity, a very severe environmental challenge calling for the utmost energization of coping resources” (Suedfeld, 1997).

Depression: A syndrome composed of having a “dysphoric mood” that entails feeling sad, hopeless, being irritable, and having a loss of interest and/or pleasure (Angst & Dobler-Mikola, 1984).

Health Behaviors: “those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement” (Gochman, 1997).

Coping Behavior: “a conscious strategy (cognitive and behavioral efforts) used by the individual when confronted with particular stressful events” (Halamandaris & Power, 1996).

Self-efficacy: described by Bandura in 1977 as “the belief in one's capability to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands” (Gist & Mitchell, 1992).

University Transition: adjusting to the freshman college year experience after moving from high school (Oppenheimer, 1984).

Delimitations of Study

Approval was received to access the data set of college students at Arizona State University (N = 2,238, aged 18 years and older). The researchers were able to access this population through the university email system. Surveys were administered via email; the researchers accumulated data from the results of the surveys and processed it. This form of collection made a data consumption from a large number of subjects possible, resulting in a large sample size. The major delimitation of this study was that it only represents college students of Arizona State University, which restricts the generalizability of outcomes in students attending other universities.

Limitations of Study

The use of a cross-sectional correlation study is a limitation, as it does not alter or manipulate either the independent or dependent variables. This type of study is short term, eliminating the possibility of observing perceived stress and the influence of health related behaviors over a long period of time for more appropriate results, as a longitudinal study typically provides. Most importantly, because this is a correlation study, it cannot demonstrate causality.

Another limitation of this study was the realization that stress affects everybody in various manners and each college student responds to stress differently. Some have more stress in their lives than others due to extreme or traumatic events that may have occurred. In addition, some college students possess stress-resistant characteristics and are not greatly affected by stress compared to those who possess stress-prone characteristics. This can alter how students rate and perceive their levels of stress in this study. The use of self-report surveys and a cross-sectional study design are limitations, as biases or misinterpretation of questionnaires may have taken place by the participants in this study. Both recall bias (“inaccurate recollection of information” (Araas, 2008)) and social desirability bias (tendency to respond in what participants believe is the most socially acceptable way (Araas, 2008)) from the participants may have altered the data results.

Lastly, technical limitations were present in this study as automation errors while evaluating all surveys and questionnaires might have caused incorrect results.

Chapter 2

REVIEW OF LITERATURE

Stress Defined and Types of Stress

The definition of stress refers to “the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within the biological system” (Selye, 1956). Stress can be described in a broader sense as the association between the environment and the present condition of the person. The response to the relationship tends to be distress or anxiety (Burke, 1991). Studies show that psychological stress occurs when an individual perceives that external demands of daily life exceed his or her adaptive capability. These studies focus on the incidence of environmental events that are continually testing the character of an individual and his or her ability to cope (Dyson & Renk, 2006). Another focal point is on the individuals’ responses to events (how they react to them both physically and mentally) that can cause an overload from perceived stress, possibly resulting negative effects (Cohen et al., 2007).

Two most common forms of stress are known throughout the literature, distress and eustress. Hans Selye, also known as “the father of the stress construct in psychology”, first proposed that distress is equated with leading to organismic breakdown. On the other hand, various studies demonstrate that stressful situations could also be perceived as challenges (Suedfeld, 1997). It is evident that in most situations, facing challenges properly creates a sense of satisfaction, increasing self esteem. Doing so also results in an enhanced ability to manage

future stressors, turning them into positive outcomes as opposed to signs of failure (Suedfeld 1997).

Traditionally social stress has been viewed as a surplus, where the demands to accommodate it are overpowering the resources necessary to cope (Burke, 1991). When coping mechanisms no longer function (resources are depleted), a breakdown from stress is expected to occur at both a personal and societal level, especially as the stressor (either distress or eustress) continues to persist. This process can occur because either the stressor is so overwhelming that the natural coping strategies are not sufficient enough, too many stressors are affecting the individual at one time, or the high level of stress persists for a long period of time (Suedfeld, 1997). Stated another way, as levels of distress increase, the ability of the individual to cope or adjust is no longer adequate. This drains his or her physical or psychological resources, which may lead to a higher occurrence of illness, injury, or disease (Thoits, 1995).

Experiencing burnout is a common constellation of negative reactions to stress. Pruessner and colleagues define burnout as “a syndrome with physical symptoms including exhaustion, fatigue, headaches, and disturbed sleep patterns. In addition, nonspecific pain, reduced attention span, feelings of meaninglessness, apathy, or detachment from work can also be presented by burned out subjects” (Pruessner et al., 1999). Burnout is similar to Chronic Fatigue Syndrome (CFS), which can also be a serious outcome of stress. Furthermore, researchers discovered that burnout is related to certain states of stress. It is perceived that

continual stressful demands in the environment tend to develop insufficient emotional responses that can lead to burnout (Pruessner et al., 1999).

Distress and eustress are known to be disruptive and enhancing, respectively. Two subtypes of stress address these categories: hindrance-related stress and challenge-related stress. Boswell et al. defines the first “stress that stems from work-related demands or circumstances that tend to constrain or interfere with an individual’s work achievement, and which do not tend to be associated with potential gains for the individual” (Boswell et al., 2004). The authors described the latter as “stress stemming from work-related demands or circumstances that, although potentially stressful, have associated potential gains for individuals” (Boswell et al., 2004).

Hindrance and challenge-related stress help decipher the differences between distress and eustress. Distress and hindrance stress consist of events causing strain that tend to be negative and harmful, whereas eustress and challenge-related stress have positive effects on individual well being and leave room for gains by being open minded. For these reasons Aaron Antonovsky (1979) identified distress as known to be a pathogenic (causing disease) type of stress, whereas eustress has a salutogenic (health-enhancing aspect) effect (Suedfeld, 1997). Cohen and colleagues confirm this concept by noting that stressful events cause negative reactions (e.g. feelings of anxiety and depression), which then may result in harmful effects on biological or behavioral processes that influence disease (Cohen et al., 2007).

A third form of stress is presented throughout the literature: traumatic stress. A traumatic event is defined as “a psychologically distressing event that is outside the range of normal experience”, however Suedfeld defines traumatic stress as “an experience that invalidates one's normal assumptions of order, predictability, safety, and identity, a very severe environmental challenge calling for the utmost energization of coping resources” (Suedfeld, 1997). Traumatic stress occurs in a large portion of society and must have an equal amount of understanding and attention as distress and eustress.

Three major forms of stressors are common in our environment today and are investigated throughout the literature: life events, chronic strains, and daily hassles (Thoits, 1995). In a broad sense, life events are modest changes that allow for behavioral readjustments within a relatively short period of time (e.g. birth of a child, divorce). Chronic strains are constant demands which necessitate readjustments over extended periods of time (e.g. disabling injury, poverty, marital problems). Daily hassles are minute events that call for acute behavioral readjustments throughout the day (e.g. traffic jams and unexpected visitors) (Thoits, 1995). This was shown in another similar study where researcher Van Eck also discovered that small yet persistent daily hassles can result in harmful outcomes on health and general well being, not just major crises (Van Eck et al., 1996).

Stress in College Students

Distress is one of the leading factors that contributes to burn out and breakdown of the body. This can be problematic as a majority of college students

reported feeling stressed frequently. Types of stress that commonly target college students falls into four categories: academic, financial, time or health related, and self-imposed (Goodman, 1993).

Academic stress entails the student's perception of the tremendous knowledge base required in college while having an inadequate time to develop it. This stress commonly occurs during certain time periods each semester, namely when studying for or taking exams, the pressure to get good grades, and the large amount of material to learn in a short amount of time. The course-load and particular major of choice will also affect the level of stress experienced throughout college (Kunkel, 2008; Murff, 2005; Misra & McKean, 2000). The components of financial stress differ by gender. Both are burdened by the costs of tuition, textbooks, living accommodations, food, transportation, and travel. Yet males tend to spend more on entertainment and electronics, whereas females buy more clothing and personal items for appearance (Hayhoe et al., 2000).

After leaving home to a new university, students must adjust to the freshman college year experience after moving from high school. This is commonly known as the university transition (Oppenheimer, 1984). During this experience, students are beginning their transition from adolescence to adulthood (Dyson & Renk, 2006). A student must adapt to a new environment and accomplish difficult tasks, nerve-racking challenges, form relationships with peers and faculty, and being away from home and family. There are high expectations to succeed and social obligations, all while becoming an adult, being independent, and living independently (Larson, 2006; Murff, 2005). Students must perform

their own daily tasks, manage their time, budget their money, possibly attain a job and manage it around school, go to class and form beneficial study habits, maintain a schedule, and tend to their well-being. During this time, students receive a new level of responsibility. If a student expects to succeed in the college environment, he or she must be able to effectively cope with their level of stress. Particularly since the way an individual copes drastically affects his or her mental and physical well-being (Kunkel, 2008). Yet all of their demands are constantly tested by partying, drinking, using drugs, staying up all night, and all of the other temptations that the college atmosphere offers (Larson, 2006).

Failing to achieve or maintain these demands may result in poor grades, financial problems, social and family disputes, illness, and possibly dropping out of school (Arnett, 2004). When observing students who transition from living at home and being taken care of to being on their own with newfound responsibilities, the difference seems extreme. Therefore it is no surprise that college students have difficulty adjusting to university life and experience constant stress on a daily basis (Dyson & Renk, 2006). Life's demands continue to add stressors in the daily lives of college students even after they make the university transition and have settled into a routine (Dyson & Renk, 2006; Larson, 2006). A moderate level of stress may be required and even advantageous in order to encourage an individual to succeed (Larson, 2006). However an excessive amount may overwhelm an individual and lead to anxiety, depression, physical illness, and long-term physical and psychological health problems (Larson, 2006). This is particularly seen in females, as female students report

greater levels of stress and more health problems than their male counterparts (Hall et al., 2006). Females tend to have a lower tolerance to illness than males, and report more minute symptoms as illness. Whereas males report fewer cases of illness (possibly due to masculinity) and often are either unaware or unconcerned about their health problems (Hall et al., 2006).

Many studies have identified several sources of stress in college students, namely being away from home, adapting to a new environment, pressure, forming new social relationships, budgeting time and money, social obligations, and academic demands (Hall et al., 2006). New responsibilities, high expectations, and extreme demands may leave a student feeling overwhelmed with too many things to do and too much to learn too quickly (Dyson & Renk, 2006; Larson, 2006). Universal academic stressors entail the perceived extent of the knowledge required for a student to perform well in the classroom, along with the understanding that a short time is allotted to develop it. Academic stressors tend to be high during the most active times of the semester when studying, exams, papers, projects, presentations, etc. are frequent (Hall et al., 2006). This stressful time results in competition with peers for better grades and the feeling of being pressured to complete a large amount in a short time period (Larson, 2006; Misra & Castillo, 2004). It has been shown that the level of stress that students experience is equivalent to the same level of stress that adults experience when attaining a new job, particularly in a working mom who is accustomed to being at home with her family (Larson, 2006).

An interesting notion is that procrastination is a common trait seen in many college students. This characteristic can be both beneficial and harmful. A large number of students admit to working better while under pressure and a time constraint to finish a task and feel more productive (as the excessive stress causes peak performance) (Tice & Baumeister, 1997). Procrastinators tend to have lower stress levels and less illness early on in the semester than those who do not procrastinate, yet reported more stress and showed higher incidents of illness towards the end of the semester (Tice & Baumeister, 1997). Studies have shown that they tend to have an overall higher rate of sickness and typically receive lower grades on all of their assignments, implying a lower level of performance (Tice & Baumeister, 1997).

Students who procrastinate claim that the same amount of work and suffering is completed on a task as for those who do not exemplify this characteristic; it is simply the timing of the stress (early on or later before the task is due). Some even say that they suffer less due to being stressed for a shorter amount of time than non-procrastinators (Tice & Baumeister, 1997). However, more negative outcomes have been shown due to procrastination than positive ones. It has been linked to depression, anxiety, poor study habits, and low self-esteem, particularly near the time of an exam. It has also been demonstrated that procrastination leads to high levels of stress, daily hassles, and negative life events (Tice & Baumeister, 1997).

One study tested the relationships between procrastination and performance by having forty four students voluntarily take a psychology class. A

term paper due date was given to the students at the beginning of the class, and also an extension of the due date could be given if the students who could not complete the paper in time. One month into the semester, the students filled out a procrastination scale then filled out symptom checklists daily and measured stress load requirements weekly. The date that each student turned in the term paper at the end of the class was recorded and students completed a questionnaire on the level of relief he or she felt after completing the paper (Tice & Baumeister, 1997).

The results of this study showed that the levels of stress measured from the questionnaires correlated with when the students turned in the term paper. The students who procrastinated showed high levels of stress, as well as a greater amount of relief after having completed the paper. An odd outcome was that the procrastinators exhibited higher levels of stress but demonstrated better health than those who did not procrastinate. This could be explained by the health measures of the students being collected at the beginning of the semester when the stress levels of the procrastinators were still low (Tice & Baumeister, 1997).

Health Behaviors for Stress Management

Addressing and eliminating the accumulation of daily stressors is important to prevent harmful mental and physical health effects and chronic disease. The awareness or perception of stressors generates a stress reaction, which refers to “the state of physiological or emotional arousal that usually, but not inevitably, results from the perception of stress or demand” (Thoits, 1995). Stress reactions can be categorized as behavioral, emotional, or physical. According to Dyson and Renk, coping can be defined as “cognitive and

behavioral attempts to alter events or circumstances that are threatening” (Dyson & Renk, 2006). There are two types of coping strategies: problem-focused coping strategies which are used to alter a problematic situation, and emotion-focused coping strategies that control emotional responses to a problematic situation (Dyson & Renk, 2006).

When individuals continually interact with their environment on a personal level, they unknowingly reach for available coping resources during threatening or challenging events (Cohen et al., 1983). It has been publicized that the worst stress reactions occur when a situation is perceived as intimidating or demanding. This is often when perceived coping ability and insufficient resources are available to control the situation (Cohen et al., 1983). Both types of coping strategies have resulted in various outcomes, with problem-focused coping being associated with reduced levels of depression. It has been demonstrated that men use problem-focused coping strategies to manage their stress, while women are more likely to use emotion-focused strategies (Dyson & Renk, 2006).

The effectiveness of managing a stressor depends on how well it is identified. Studies show that people often misdiagnose their stressors and feelings to a particular source, when the cause of the stress actually developed elsewhere. Researchers have demonstrated that the Perceived Stress Scale (PSS) can be used to determine whether stress is an etiological risk factor in disorders or disease (Cohen et al 1983).

Cohen and colleagues performed a measure of stress study on college students in 1983 that is still pertinent to the current research and literature today.

The researchers wanted to measure factors of social anxiety and the perceived level of stress in college students, particularly in freshman. Freshman were targeted as they are the population who go through the transition from living at home to moving into a new community and need to adapt accordingly. The researchers expect that the college students will have a high level of stress, but especially freshman with the new transition, adapting to their new environment, and fitting in.

Participants consisted of freshman college students living in the dormitories at the University of Oregon. The study consisted of three samples. In the first sample, researchers administered a modified version of the College Student Life-Event Scale (CSLES) (asking about the demands of college students) used to measure life events, the Center for Epidemiologic Studies Depression Scale (CES-D) which measured their current level of depressive symptomatology, the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS), followed by the Social Avoidance and Distress Scale (SADS) to measure social anxiety (social avoidance and distress). The researchers incorporated the university's student health center by recording the number of visits each participant took to the center in order to assess symptomatic problems of stress that were treated during each visit.

The second sample of participants completed the same five questionnaires as sample one during a one and a half hour session in the second week of the Spring Quarter. The third sample group participated in a smoking-cessation

program run by the University of Oregon Smoking Control Program. All sample groups also completed the PSS (Perceived Stress Scale).

Treatment lasted for six weekly sessions lasting approximately 2 hours each and included behavioral-management techniques, nicotine-fading, and cognitive-behavioral relapse prevention. The results showed that the PSS score was closely related to the life-impact score, which is based more on the student's appraisal of the event than on the objective number of events occurring. The PSS was also a better predictor of health and health related outcomes than any of the other scales, as it was highly correlated with symptoms of depression. The researchers conclude that the PSS is the most effective scale used to assess stress levels in college students (particularly which situations are appraised as stressful), as it is brief, easy to administer, and specific (Cohen et al 1983).

Most college students use health behaviors to relieve, manage, or cope with stress. Health behaviors are described as "those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement" (Gochman, 1997). These personal attributes are often influenced by family, social, societal, institutional, and cultural determinants (Gochman, 1997).

The term health behavior commonly represents actions taken by people who believe they are not experiencing any signs of illness. They are completed for the sake of remaining well, as preventative actions (Gochman, 1997). Some

positive preventative health behaviors generally executed by college students are getting a proper amount of sleep (approximately 8 hours a night), practicing healthful eating habits, weight management, and engaging in physical activity (including participating in active sports, swimming, exercise, or leisure activity). These are used to both prevent disease and allow for optimal health, but are also used to relieve stress. Other studies on students exemplify additional positive stress management techniques in the college atmosphere. These included exercise and physical activity, reading, meditation, yoga, religious activities (e.g. church, prayer, college youth groups and ministries), listening to music, being around friends and family, engaging in arts and crafts, and catching up on sleep (Cohen et al., 2007). Various studies demonstrate an inverse relationship between religion and depression/suicide. Furthermore, participating in both religious events (church, youth group, etc.) and even attending a religious university reduces the risk of stress and depression (Furr et al., 2001).

Psychological stress might inhibit immune function through innervations of lymphatic tissue by the release of cortisol and various hormones that bind to active cells in the immune system. The active cells of the immune system are also affected by engaging in stress-induced behavioral changes such as heavy smoking. In addition, McEwen and Sapolsky noted in their study that physiological and psychological stressors increase the secretion of glucocorticoids by the adrenal gland. High levels of glucocorticoids have an inhibitory effect on learning and memory with the hippocampus (McEwen & Sapolsky, 1995).

Learning and memory impairments allow for decreased academic performance in college students, possibly resulting in even higher levels of stress.

Cohen and colleagues demonstrated maladaptive reactions to stress that are viewed as negative behaviors. These are frequently seen in college students as an attempt to manage stress. They include excessive consumption of alcoholic beverages, smoking, and drug use, driving recklessly (especially while not wearing a seatbelt), disobeying the law, and engaging in unsafe sex activities (Gochman, 1997). These are often performed during or after parties. Others include physical inactivity, unhealthful diets, overeating or else not eating at all, poor adherence to taking medication, playing video games all day, and sleep deprivation. These behaviors deplete the immune system, allowing for stress to potentially result in negative health outcomes (Cohen et al., 2007). Contrary to common belief, the types of health behaviors exemplified to manage stress did not differ between males and females (Dyson & Renk, 2006).

Depression and Negative Health Outcomes

The literature shows that out of the three major stressors previously described (life events, chronic strains, and daily hassles), continual chronic strains are just as damaging to both mental and physical health as life events (Thoits, 1995). Physical health is most often affected from more dramatic events, whereas mental health is affected by continual chronic occurrences. Persistent exposure to chronic stress has been known to be extremely toxic to an individual's health since chronic strains can result in long-term or permanent changes in emotional, physiological, and behavioral responses (Cohen et al., 2007). These types of

reactions influence susceptibility to disease and include both demanding events that persist over an extended period of time (e.g. caring for a spouse with dementia) or brief focal events that continue to be interpreted as overwhelming long after they have occurred (e.g. experiencing a sexual assault) (Cohen et al., 2007).

Depression is defined as “a syndrome composed of having a “dysphoric mood” that entails feeling sad, hopeless, being irritable, and having a loss of interest and/or pleasure”. It is not just a change in mood, but an actual syndrome of illness (Angst & Dobler-Mikola, 1984). A person with depression may suffer from personality disorders, instability of mood, and social impairment (Angst & Dobler-Mikola, 1984). Other symptoms include mistrust, isolation, unassertiveness, external locus of control, lack of confidence and achievement, and diminished masculinity (for males). Depressed students may experience a lack of coping skills, academic problems and lower grades, increased pressure from peers, difficulty making friends and decreased acceptance, feel unloved and rejected, low levels of family support, lack of motivation, and difficulty adjusting to the independence of being away from home (Dyson & Renk, 2006; Vredenburg et al., 1988; Westefeld & Furr, 1987). Signs of depression may even lead to thoughts or attempts of suicide in many cases (Furr et al., 2001; Angst & Dobler-Mikola, 1984; Vredenburg et al., 1988).

The syndrome is measured by self-reported surveys and questionnaires such as the Beck Depression Inventory, as well as discussions with counselors

determining depressive symptoms and behaviors (Furr et al., 2001; Vredenburg et al., 1988; Angst & Dobler-Mikola, 1984).

There are a variety of reasons that depression may be caused. In the college environment, these range anywhere from social problems, helplessness, inadequate reasons for living, academic problems, and interactive factors. Other contributing causes are known to be hopelessness, parental problems, and legal problems (Furr et al., 2001; Westefeld & Furr, 1987). Moving away from home for college (experiencing the university transition) especially to a large university has been shown to cause more loneliness and money problems that lead to decreased academic performance, illness, and depression. This is compared to students who remain at home and attend a local community college who experience less depression (Furr et al., 2001). All of these factors are considered to be stressors which promote distress. It is known from research that high levels of perceived stress are related to the increased incidence of depression and other health outcomes in college students, in comparison to those who do not attend college (Larson, 2006).

As a participating factor in most suicides, depression is thought to be the top psychiatric disorder on college campuses (Vredenburg et al., 1988; Westefeld & Furr, 1987). A study published by Schwartz and Whitaker showed that the level of depression on college campuses is increasing. Professionals working in the college counseling offices at the reported universities studied were noticing a drastic increase in the severity of the problems being discussed by students (Furr et al., 2001). As students adjust to university life, depression may be more

prominent. They are more likely to experience feelings of sadness during the university transition as well as when they are having difficulty coping with stress properly (Dyson & Renk, 2006).

Another study was conducted which observed a total of 962 college students at three different universities. The results of that study demonstrated that 81% of the students experienced that what they felt was depression while in college. This was due to grade, relationship, and money problems, as well as loneliness. In addition, 32% of these students thought of committing suicide from their depression, and 1% even attempted it (Furr et al., 2001).

The most common cures for depression are counseling and medication. Many depressed students attend counseling sessions and often find them to be helpful. Having someone to talk to, being assisted in exploring options, developing new ways to look at things, and receiving medication are some common reasons that counseling is beneficial for students (Furr et al., 2001). However, only a small amount of college students get counseling or medication for their depression and remain untreated.

Depression tends to be more common in females, as the ratio is usually 1:2 males to females affected with depression (Angst & Dobler-Mikola, 1984). This could be due to males reporting fewer symptoms than females or are in denial, as in the case of reporting illness. Females are inclined to report more feelings and emotions, whereas males often report less or less significant ones. Symptoms such as worthlessness, loss of interest, lack of sleep, loss of energy, agitation, and appetite disturbances are especially mentioned and observed less often by males

(Angst & Dobler-Mikola, 1984). Yet another study by Seligman and colleagues discovered that the increased incidents of depression in females may be primarily due to the fact that women reflect more on present and past difficulties more so than males (Seligman et al., 1974). Females display a higher level of concentration than males, which benefits them in the college environment. Thoughts of death are more prevalent in females, yet the actual morbidity numbers from depression are equal for both genders (Angst & Dobler-Mikola, 1984). Despite knowing that suicide can be an ultimate outcome of depression, only 37% out of the 53% of students who reported being depressed believed that it is a serious problem (Furr et al., 2001).

As previously mentioned, stressors of all sorts are a major source of negative outcomes pertaining to morbidity and even mortality. An exceptional review analysis written by Cohen and colleagues focused on a majority of the associations between psychological stress and disease. The review showed that high correlations between stress and disease have been demonstrated, particularly for depression (Cohen et al., 2007). Their study lists the primary disorders and diseases that are attributed to stress: including depression, both infectious and autoimmune diseases, and many types of cancer (Cohen et al., 2007; Larson, 2006; Misra & Castillo, 2004). Other symptoms often resulting from perceived stress in college students besides depression and impaired academic performance include: lack of energy, loss of appetite, headaches, gastrointestinal problems, sleep problems, anxiety, emotional distress, and impaired memory (Larson, 2006;

Misra & Castillo, 2004). Additional physiological responses are increased respiration, blood pressure, blood glucose, and heart rates (Murff, 2005).

Further emphasis links stressful life events to both depressive symptoms as well as major depressive disorders. Some individuals who experience a major life event or continual extreme stressors have been known to develop depression; 50-80% of depressed people experienced a major life event 3-6 months before the onset of the depression (Cohen et al., 2007).

Positive Health Outcomes

Even if a stressor is negative or even traumatic, individuals can learn and grow from those experiences resulting in a stronger mentality. Difficulties and challenges may be viewed as motivation to improve oneself, instead of resulting in burn out or failure. It is human nature to automatically exhibit problem-solving activity and interpret the meaning of experiences throughout life to reduce nervousness and feel a sense of empowerment through self-worth (Thoits, 1995). Psychological studies discover that humans tend to be predictable yet changeable, as individuals are aware of their environment and use their keen senses to observe and learn from their own experiences in addition to those of others. Individuals have the choice to change themselves for the better after witnessing these events. In addition, humans are continually seeking to protect and enhance their well-being, and Thoits explains in her study that they may intentionally create positive events in their lives to counteract the negative ones for self-assurance (Thoits, 1995). Creating a “fresh start” with a new beginning and a clean slate can aid in recovery from mental disorders such as depression and panic attacks from chronic

anxiety issues. Therefore, positive events are just as important for physical and mental health as the negative ones.

The outlook or perception of stressors drastically alters the effect that the stress has on the body. If an individual views stress as not appropriate, it will most likely have a harmful impact and detrimental outcome. However if one displays optimism towards stress, the effect of its outcome will be less severe and potentially even positive. Having an optimistic perception and control over stressors reduces stress levels and overall illness, as it has been hypothesized that having an optimistic perception of life results in psychological well-being (Chang, 1998).

Chang (1998) tested this hypothesis in his study. He recruited 400 undergraduate college students (both men and women) from a Midwestern university to participate in the study. All participants were enrolled in a psychology class and were measured for dispositional optimism and pessimism by a revised version of the Life Orientation Test, followed by completing a Perceived Stress Scale after. Psychological well-being was the next assessment to follow and was measured by the Beck Depression Inventory and Satisfaction with Life scales. All questionnaires were administered as take home surveys to be returned the next day of class.

The results of this correlation study showed that optimism had an inverse relationship to symptoms of depression and was directly connected with life satisfaction. This association was consistent with previous findings on optimism and negative life events. As expected, perceived stress correlated with increased

depression symptoms and a lower satisfaction on life. These outcomes can be explained as optimism “has a direct influence on psychological adjustment beyond what can be accounted for by perceived stress and moderates the relation between stress and psychological well-being” (Chang, 1998).

Self-Efficacy

In general, self-efficacy is a construct derived from the Social Cognitive Theory that refers to one’s judgment and ability to execute thoughts, feelings, and actions in order to produce a certain outcome (Bandura, 1986). A person who is able to produce desired outcomes is able to live a more self-influenced path through life. Coping with stress in positive ways tends to increase self-efficacy. This can lead to greater motivation and success, resulting in positive health outcomes such as better quality of life and both mental and physical well being (Torres & Solberg, 2001).

A study by Schwarzer and Renner covers health-specific self efficacy or “a person’s optimistic self-belief about being capable to resist temptations and to adopt a healthy lifestyle” (Schwarzer & Renner, 2000). The adoption of health practices entail measuring self-efficacy to evaluate its influence on change in behavior. In studies that assess individuals who change negative behaviors into beneficial ones, the subjects first show doubt and denial, contemplating if they even want to initiate the behavior change. The studies showed that perceived self-efficacy was the best indicator of both the intention to change a behavior and of executing the new behavior (Schwarzer & Renner, 2000).

Within the same category, similar studies demonstrated that perceived self-efficacy proves to be a useful resource in coping with stress. Managing stressors through self-efficacy showed to have a positive impact on immune functioning (Schwarzer & Renner, 2000). In addition, patients with high self-efficacy demonstrated better control of pain than patients with low self-efficacy. Properly utilizing self-efficacy also affects blood pressure, heart rate, low self-efficacy, and catecholamine levels in a beneficial way when faced with a challenging or threatening situation (Schwarzer & Renner, 2000). Self-efficacy serves a helpful role in a variety of health related settings and outcomes.

Self-efficacy is particularly important in college students, as self-efficacy is goal oriented and is known to increase goal performance. It can enhance academic performance, as academic self-efficacy promotes confidence in reading textbooks, asking questions in class, and studying for exams (Torres & Solberg, 2001). Self-efficacy can also make it easier for students to engage in social activities, fit in, and adapt to the college environment. Individuals with high self confidence typically result in better academic outcomes, but even perceive failure as a motivational challenge to improve as opposed to giving up or quitting (Torres & Solberg, 2001). As more improvement occurs, students tend to feel more connected with their environment (through family, peers, and faculty), particularly during stressful situations as they feel a sense of belonging. Self-efficacy allows a student to use all of the resources available in order to manage stress during the college experience (Torres & Solberg, 2001).

Many studies show that social support is a major contributor to improving self-efficacy, particularly in Hispanic and other low-income populations. Family support systems offer security and encouragement, as well as encourage students to explore and take risks. A student with high self-efficacy through strong support systems tend to bond with faculty and peers easily and has a stronger determination to succeed in college (Torres & Solberg, 2001). This is important as doing well in both the academic and work environment is achieved based on building constructive relationships with others. Hispanic students and others from strong cultured populations feel more harmonious with their health through their culture (Torres & Solberg, 2001).

A study on Latino college students was performed on evaluating the correlations between social support and academic self-efficacy. Researchers predicted that a combination of self-efficacy, social integration, family support, and stress were expected to improve determination outcomes in college students. Both Latino and Latina college students were selected from cohort studies to participate in the study. Part of the students received a survey by mail and the remaining students completed surveys in class. Surveys included demographic questionnaires, measures of stress, self-efficacy, social and faculty integration, motivation intentions, and stress levels. A specific self-efficacy inventory scale was also used to measure the level of confidence in performing tasks common with success. Upon evaluation of these measurements, it appeared that course self-efficacy, roommate self-efficacy, and social self-efficacy all had dramatic influential effects on a college student (Torres & Solberg, 2001).

A college stress survey was administered next, showing that financial, academic, and social stresses were the top three stressors affecting Latino college students. Social integration and determination surveys followed, in addition to questionnaires on family support and lastly physical and psychological health. The connections made with other students and faculty members showed to have the greatest affect on academic performance. One interesting result was that college students enrolled in a two year degree program experienced less stress and adverse health problems than students attending a four year university. Students who studied more had higher levels of academic self-efficacy than those who did not study as much, and those who were married, had a significant other, or a close relationship with their family all resulted in having more determination to succeed. Performance self-efficacy was stronger in students who had good relationships with the faculty members of their school and even showed higher intentions to graduate. As researchers expected, lower levels of stress in the students was associated with better general health. Overall, this study showed that self-efficacy is a key factor in determining academic outcomes (Torres & Solberg, 2001).

Chapter 3

METHODOLOGY

This research study was conducted in order to observe how perceived stress influences depression in college students and to determine what the influence of health related behaviors is on the relationship between increased perceived stress and depression. Perceived stress served as the independent variable in this study as it affected the outcome of depression resulting from the health behaviors observed in the participants. The specific research questions were:

- What is the relationship between perceived stress and depression in college students?
- What is the influence of health related behaviors on the relationship between perceived stress and depression in college students?

Participants

A random sample of 20,000 students was drawn from the 62,476 students enrolled at Arizona State University (ASU), including undergraduate and graduate students from all four ASU campuses in the Phoenix metropolitan area. These students were invited by email to participate in the American College Health Association-National College Health Assessment (ACHA-NCHA) in spring 2009. ACHA-NCHA II is a web based survey that is annually administered by the American College Health Association (ACHA). In addition, supplemental questions developed by ASU Wellness were administered as a part of the ACHA-

NCHA II for ASU students only. The study was approved by the Human Subject's Institutional Review Board of Arizona State University.

ASU sent an invitation email, wherein students were directed through a hyperlink to the survey website, which is maintained by the ACHA. A consent letter was provided prior to taking the survey which stated that by taking the survey, students were consenting to participate. Upon completion of the survey, participants were given the option to hyperlink to a separate website to submit their email address in a drawing for one of five \$200 awards for participation. Awards were applied to the students' Sun Card, and could be used at any location that accepts the ASU Sun Card. A total of 2,238 students completed the survey.

Study Design and Procedures

A retrospective cross-sectional correlation design was used to examine correlations between perceived stress, physical activity, and other health behaviors and depression in college students. The ACHA created the survey and administers the survey in the fall and spring each year to college students from participating colleges and universities across the United States. Spring administration of the survey has the highest participation by campus and by participants. The entire survey sample is labeled as the Reference Group. Spring 2009 participation included 130 institutions of higher education and 91,869 students. Only institutions that adhere to survey administration criteria are included in the Reference Group. The Spring 2009 Reference Group included 117 schools and 87,105 participants. ACHA provided institutional survey data in

an SPSS file for analysis. Data were weighted by demographic characteristics of male and female prior to descriptive and other analyses.

Data Collection

The questions on the NCHA are separated into topical categories. Demographic questions describing subject characteristics and questions that represented the purposes of this study were identified and selected from the questionnaire. The primary factors assessed were stress, anxiety, depression, alcohol and tobacco use, substance use, intake of fruits and vegetables, and cardiovascular and strength training exercise.

Perceived stress was the independent variable in this study, described in the survey as “Within the last 12 months, how would you rate the overall level of stress you have experienced? No stress, less than average stress, average stress, more than average stress, tremendous stress” (ACHA-NCHA, 2009).

Depression was assessed in two ways as the outcome variable: “Real Depression” and “Perceived Depression”. Perceived depression was assessed by the question: “Have you ever: felt things were hopeless, overwhelmed by all you had to do, exhausted (not from physical activity), very lonely, sad, so depressed that it was difficult to function, overwhelming anxiety, overwhelming anger; intentionally cut, burned, bruised, or otherwise injured yourself, seriously considered suicide, attempted suicide.” Options included no or yes. This was followed by “have you ever been diagnosed with depression? No or Yes”. If they answered yes, then other options were: yes- diagnosed but not treated; yes- treated with medication and psychotherapy; yes- other treatment” (ACHA-NCHA, 2009).

Health behaviors were mediating factors including measures such as: fruit and vegetable intake (0-5 servings a day); exercise (cardiovascular and strength training exercise 0-7 days per week); alcohol, tobacco and substance use (number of drinks, amount of prescription drugs and narcotics, and amount of tobacco consumed the last time a student went to a social gathering, over the last two weeks, over the last 30 days, and within the last 12 months) (ACHA-NCHA, 2009). On the basis of the responses to the survey, participants were grouped and categorized by these measures to prepare for evaluation.

Statistical Analysis

All data were downloaded into Statistical Package for Social Sciences (SPSS for Windows, Version 19.0). The data set was cleaned to remove data from questions that were not relevant to the study. Responses of outcome data were collapsed and categorized into three discrete levels (negative, moderate, and positive levels). Frequencies and descriptive data were evaluated to determine normality and identify erroneous or outlying data. The relationships between the independent and dependent variables were analyzed by conducting bivariate Spearman Rho correlations. Variables with significant correlations and less than 100 people in one of the three category cells were collapsed into dichotomous (yes, no) variables. The relationships were analyzed again by conducting bivariate Spearman correlations after collapsing necessary categories. Lastly, relevant independent and dependent variables were entered into logistic regression procedures.

Study Instruments

American College Health Association National College Health Assessment

(ACHA-NCHA)

The data collected from this questionnaire included a wide range of health questions. In this study only categories relevant to the specific aims of the study were selected. These categories included: health behaviors, general health habits, substance use, eating habits and nutrition, exercise tendencies, weight, mental health, and coping (ACHA-NCHA, 2009; Taliaferro et al., 2008) (See Appendix B).

Additional Questionnaire to the 2009 ACHA-NCHA

A supplemental survey consisting of additional questions that were specific to college students attending Arizona State University was also administered. This questionnaire collected information regarding which campus the students attended, their major of study, attendance to the university, receiving health information from the college, physical and mental problems which affected performance while attending the Arizona State University, stress, body image, and sexual tendencies (See Appendix C) (Arizona State University Wellness Department, 2009).

Chapter 4

RESULTS

This research study used a respective cross-sectional correlation design to determine the relationship between perceived stress and depression in college students, as well as the influence of health related behaviors on that relationship. This was done by administering a web-based survey sent via email to males and females attending Arizona State University.

Data Cleaning

Survey responses from 2,238 students were recorded and transformed into raw data, then downloaded into Statistical Package for Social Sciences (SPSS for Windows, Version 19.0). Data from all students who were above the undergraduate level were cleared from the data set. Height was transformed into inches, and body mass index (BMI) was calculated from height and weight recorded by participants. Data were organized into categories according to the questions of the survey and unnecessary data from questions that were not relevant to this study were cleared from the data. Categorical data were recoded into ascending numeric form based on the responses to the survey questions (i.e. traits, characteristics, levels, and behaviors) in order to allow for further analyses (1 = negative, 2 = moderate, 3 = positive). All missing and extreme values in the data were determined and eliminated. Two depression groups were created. One labeled “real depression” for those respondents who were clinically diagnosed and treated for depression, while the other was “perceived depression” for those who claimed to feel sad, hopeless, depressed, and suicidal.

Demographic Characteristics

Participants consisted of 1,063 men and women between the ages of 18-25 years old. The sample included more women ($n = 580$) than men ($n = 483$).

Participants were excluded from the study if they were over the age of 25 years old, were not undergraduate students, and did not attend Arizona State University.

Frequency and descriptive analyses were used to examine the demographic characteristics of the participants. As can be seen in Table 1, age was not different between the sexes with a mean age of 23.4 ± 6.2 years. The mean height was 67.6 ± 4.0 inches and the mean weight was 156.6 ± 39.8 pounds. BMI, height, and weight were significantly higher in males as compared to females (See Table 1).

Table 2 displays that 20.0% of participants reported being in their first year of college. Whereas almost 30% of participants reported that they were in their third year and only 10.5% reported as being a fifth year student. The majority of participants characterized themselves as being “White” (66.5%). Only about 1.5% of participants affirmed themselves as “Black” or “Indian”. About 10% were “Hispanic” and 9% characterized themselves as “Mixed” ethnicities. Almost half of the population was “not in a relationship” at 49.6%, and the lowest percentage of respondents affirmed that they were “in a relationship, living together” at 15.2%. More males were not in a relationship than females, and more females were living with their significant other than males. Only 6.5% of the participants stated that they were “married/partnered”, and 91.6% accounted that they were “single”. More female subjects were both

Table 1

Comparison of Means of Demographic Characteristics

Variable	Male (n = 483)	Female (n = 580)	Total (n = 1063)	p- value
Age (years)	23.2 ± 5.8	23.6 ± 6.4	23.4 ± 6.2	0.374
Height (inches)	70.8 ± 2.9	64.9 ± 2.7	67.6 ± 4.0*	0.000
Weight (pounds)	177.1 ± 39.6	139.4 ± 30.8	156.6 ± 39.8*	0.000
Body Mass Index (BMI)	24.8 ± 5.0	23.2 ± 4.6	23.9 ± 4.8*	0.000

* Significant differences between means (p-value <0.05)

Note. Means data are reported as means ± standard deviation.

married and single than males. Approximately 26.8% of respondents described that they lived on campus, with 21.6% lived in a residence hall on campus, 0.8% were in a fraternity or sorority house, and 4.4% were living in other on-campus housing. Some affirmed that they lived with their parent or guardian (25.8%), and 45.0% had other off-campus housing arrangements (See Table 2).

Comparison of Mean Values

Real Depression and Health Behaviors

Table 3 demonstrates the comparison of mean data for between measures of real depression (has depression versus does not have depression) and various health factors in this research. Those reporting real depression had significantly higher stress ($p < 0.001$) and reported higher general health ($p = 0.012$), as well as

Table 2

Demographic Characteristics by Percentage of Males and Females

Variable	Male Valid % (n = 483)	Female Valid % (n = 580)	Total Valid % (n = 1063)
Year In School			
1 st year	35.7	64.3	20.0
2 nd year	43.2	56.8	16.6
3 rd year	49.5	50.5	29.6
4 th year	47.0	53.0	23.2
5 th year	53.6	46.4	10.5
Ethnicity			
White	46.5	53.5	66.5
Black	50.0	50.0	1.5
Hispanic	48.2	51.8	10.4
Asian	32.5	67.5	3.8
Indian	46.7	53.3	1.4
Other	64.7	35.3	1.5
Mixed	31.5	68.5	8.7
Relationship Status			
Not in a relationship	53.8	46.2	49.6
In a relationship, not living together	41.2	58.8	35.2
In a relationship, living together	28.0	72.0	15.2
Marital Status			
Single	46.3	53.7	91.6
Married/Partnered	30.9	69.1	6.5
Divorced	50.0	50.0	0.2
Other	44.4	55.6	1.7
Current Residence			
Campus Residence Hall	49.8	50.2	21.6
Fraternity/Sorority house	62.5	37.5	0.8
Other on-campus housing	48.9	51.1	4.4
Parent/Guardian's house	42.3	57.7	25.8
Other off-campus housing	45.4	54.6	45.0
Other	26.9	73.1	2.4

Table 3

Comparison of Mean Values of Real Depression and Health Behaviors

Variable	Real Depression		p-value
	No depression (n = 747)	Has depression (n = 315)	
General Health	2.0 ± 0.1	2.0 ± 0.2*	0.012
Level of Stress	1.7 ± 0.7	1.5 ± 0.7*	0.000
Causes of Stress: Academic	1.9 ± 0.7	1.7 ± 0.7*	0.002
Causes of Stress: Career Issues	2.3 ± 0.7	2.2 ± 0.8	0.281
Causes of Stress: Living Situation	2.4 ± 0.7	2.3 ± 0.7*	0.010
Causes of Stress: Finances	2.2 ± 0.8	2.2 ± 0.8	0.945
Causes of Stress: Friends	1.9 ± 0.2	1.9 ± 0.3	0.184
Causes of Stress: Intimate Relationships	2.4 ± 0.7	2.3 ± 0.7	0.080
Causes of Stress: Over Committed	2.2 ± 0.8	2.1 ± 0.8	0.264
Causes of Stress: Sleep Difficulties	1.2 ± 0.3	1.9 ± 0.3	0.079
Total Physical Activity Level	1.9 ± 0.7	1.9 ± 0.8	0.251
Number of Fruits/Vegetables Daily	1.3 ± 0.5	1.3 ± 0.5	0.690
Nutrition Habits	1.5 ± 0.5	1.4 ± 0.5	0.111
Amount of Sleep (each night)	2.1 ± 0.7	2.0 ± 0.7	0.362
Sleep Issues	1.7 ± 0.5	1.7 ± 0.5	0.325
Smoking	1.5 ± 0.5	1.4 ± 0.5	0.089
Substance Use	1.6 ± 0.5	1.6 ± 0.5	0.629
Prescription Misuse	1.8 ± 0.4	1.7 ± 0.5*	0.011
Frequency of Alcohol (in 1 month)	1.6 ± 0.8	1.5 ± 0.8	0.625
Participation in Sports	1.8 ± 0.4	1.8 ± 0.4	0.981
Volunteering (hours per week)	1.4 ± 0.5	1.4 ± 0.5	0.979
Work for Pay (hours per wk)	1.7 ± 0.6	1.7 ± 0.7	0.667
Suicide (attempts or thoughts)	1.9 ± 0.3	1.9 ± 0.4*	0.000

* Significant differences between means (p-value <0.05)

Note. Means data are reported as means ± standard deviation. All variables were recoded in three distinct groups: 1 = negative behavior/factor, 2 = moderate behavior/factor, 3 = positive behavior/factor. Only “General Health” had two groups: 1 = “Other” and 2 = “Excellent”.

prescription misuse ($p = 0.011$) compared to those who did not report being diagnosed. In addition, those in the real depressed group reported that academic responsibilities and current living situations were the cause of their stress as compared to those with no real depression. There were no significant differences between real depression groups (See Table 3).

Perceived Depression and Health Behaviors

Table 4 indicates the mean data for the outcome measures of perceived depression and various factors and behaviors in this study. Individuals in the perceived depression group were significantly different from no perceived depression on many variables. Significant mean differences between perceived depression groups were seen in stress and causes of stress. Those in the perceived depression group had more stress from academic responsibilities, as well as from friendships and intimate relationships, career, living, and financial issues. Those in the perceived depression group also reported being more over committed, got less sleep each night, and had a greater amount of sleep difficulties.

An important finding was that participants in the perceived depression group also had lower physical activity levels than those who did not have perceived depression. Lastly, behaviors including smoking, substance use, participation in sports, and thinking or attempting suicide were significantly different between groups in those who had perceived depression (See Table 4).

Table 4

Comparison of Mean Values of Perceived Depression and Health Behaviors

Variable	Perceived Depression		p-value
	No depression (n = 80)	Has depression (n = 983)	
General Health	2.0 ± 0.0	2.0 ± 0.1	0.207
Level of Stress	2.4 ± 0.7	1.5 ± 0.7*	0.000
Causes of Stress: Academic	2.6 ± 0.6	1.8 ± 0.7*	0.000
Causes of Stress: Career Issues	2.3 ± 0.5	2.2 ± 0.7*	0.000
Causes of Stress: Living Situation	2.9 ± 0.4	2.4 ± 0.7*	0.000
Causes of Stress: Finances	2.7 ± 0.5	2.2 ± 0.8*	0.000
Causes of Stress: Friends	2.0 ± 0.0	1.9 ± 0.3*	0.014
Causes of Stress: Intimate Relationships	2.8 ± 0.4	2.3 ± 0.7*	0.000
Causes of Stress: Over Committed	2.8 ± 0.5	2.1 ± 0.8*	0.000
Causes of Stress: Sleep Difficulties	2.0 ± 0.1	1.9 ± 0.3*	0.009
Total Physical Activity Level	1.7 ± 0.6	1.9 ± 0.7*	0.033
Number of Fruits/Vegetables Daily	1.4 ± 0.5	1.3 ± 0.5	0.215
Nutrition Habits	1.5 ± 0.5	1.5 ± 0.5	0.394
Amount of Sleep (each night)	2.1 ± 0.6	2.0 ± 0.7*	0.026
Sleep Issues	1.8 ± 0.5	1.7 ± 0.5	0.299
Smoking	1.6 ± 0.5	1.5 ± 0.5*	0.010
Substance Use	1.8 ± 0.4	1.6 ± 0.5*	0.001
Prescription Misuse	1.8 ± 0.4	1.7 ± 0.4	0.111
Frequency of Alcohol (in 1 month)	1.7 ± 0.9	1.5 ± 0.8	0.066
Participation in Sports	1.6 ± 0.5	1.8 ± 0.4*	0.003
Volunteering (hours per week)	1.4 ± 0.5	1.4 ± 0.5	0.715
Work for Pay (hours per wk)	1.6 ± 0.6	1.7 ± 0.6	0.182
Suicide (attempts or thoughts)	2.0 ± 0.1	1.9 ± 0.3*	0.017

* Significant differences between means (p-value <0.05)

Note. Means data are reported as means ± standard deviation. All variables were recoded in three distinct groups: 1 = negative behavior/factor, 2 = moderate behavior/factor, 3 = positive behavior/factor. Only “General Health” had two groups: 1 = “Other” and 2 = “Excellent”.

Correlation Analysis

The overall Spearman Rho correlations for each of the primary outcome variables for real depression and perceived depression are presented in Table 5. Low but significant relationships were present between real depression and levels of stress ($r = -0.124$). (Note: behaviors were categorized such that negative value was labeled lower number, e.g., high stress = 1, thereby making the relationship inverse). Also academic responsibilities, current living situations, nutrition habits, prescription misuse, and suicide were all significantly correlated to real depression. The strongest associations with real depression were found between attempts or thoughts of suicide ($r = -0.14$; $p < 0.01$); and levels of stress ($r = -0.12$; $p < 0.01$). Total physical activity level, levels of sleep, and nutrition habits were expected to have strong correlations, but were not statistically correlated with real depression (See Table 5).

Significant inverse relationships also existed between perceived depression and other health variables. Levels of stress and perceived depression were significantly correlated ($r = -0.27$). Table 5 also displays low but significant ($p < 0.01$) correlations between perceived stress with academic responsibilities, career-related issues, current living situation, finances, intimate relationships, being over committed, and substance use. Interestingly, participation in sports and total physical activity were weakly positively associated with perceived depression. This indicates that greater participation in activity or sport was resulted in greater perceived depression.

Table 5

Overall Bivariate Correlations of Real Depression, Perceived Depression, and
Attributing Factors

	Real Depression (n = 315)	Perceived Depression (n = 983)
Age (years)	-0.013	-0.076*
Year in School	0.013	-0.052
General Health	-0.075*	-0.037
Level of Stress	-0.124**	-0.272**
Causes of Stress: Academic	-0.095**	-0.266**
Causes of Stress: Career Issues	-0.038	-0.206**
Causes of Stress: Living Situation	-0.091**	-0.198**
Causes of Stress: Finances	-0.013	-0.193**
Causes of Stress: Friends	-0.041	-0.073*
Causes of Stress: Intimate Relationships	-0.051	-0.173**
Causes of Stress: Over Committed	-0.031	-0.232**
Causes of Stress: Sleep Difficulties	-0.060	-0.073*
Total Physical Activity Level	0.035	0.060*
Number of Fruits/Vegetables Daily	-0.007	-0.044
Nutrition Habits	-0.061*	-0.035
Amount of Sleep (each night)	-0.035	-0.060
Sleep Issues	-0.030	-0.030
Smoking	-0.050	-0.070*
Substance Use	-0.036	-0.093**
Prescription Misuse	-0.085**	-0.053
Frequency of Alcohol (in 1 month)	-0.019	-0.047
Participation in Sports	0.006	0.090**
Volunteering (hours per week)	-0.006	-0.011
Work for Pay (hours per wk)	-0.025	0.045
Suicide (attempted or thoughts of)	-0.138**	-0.071*

*Correlation is significant at the 0.05 level. (2-tailed)

**Correlation is significant at the 0.01 level. (2-tailed)

Note. All attributing factors were recoded in three distinct groups: 1 = negative behavior/factor, 2 = moderate behavior/factor, 3 = positive behavior/factor. Only “General Health” had two groups: 1 = “Other” and 2 = “Excellent”.

The significant relationships between perceived depression and the other variables ranged from 0.06 to -0.27 with the strongest association was found between levels of stress and perceived depression ($r = -0.27$; $p < 0.01$); the weakest significant relationship was total physical activity level and perceived depression ($r = 0.060$; $p < 0.05$) (See Table 5).

The correlations that were present for both real and perceived depression were levels of stress, which shows that this factor does have a relationship with depression in college students. In addition, having numerous academic responsibilities, a bad living situation, and attempting or thinking of suicide were also correlated to both forms of depression. Nonetheless, it is again key to mention that these correlations listed were all very weak.

Logistic Regression Analysis

Logistic regression results indicated the odds ratios for the various variables to predict the likelihood of being categorized in either of the depression categories. The two variables that were statistically significant for students considered to be in the real depression category were levels of stress (Chi Square value = 6.250, Odds Ratio = 1.839, and 95% C.I. = 1.141-2.966) and general health (Chi Square value = 5.848, Odds Ratio = 3.275, and 95% C.I. = 1.252-8.565). These categories were significant at the $p < 0.05$ level. Therefore, a student was about 1.8 times more likely to be in the real depressed category if he or she had high levels of stress. None of the other variables had significant odds ratios to predict students in the real depression category (See Appendix E).

The strongest statistically significant variable that predicted students in the perceived depression category was levels of stress (Chi Square value = 60.600, Odds Ratio = 20.837, and 95% C.I. = 9.700-44.760), which was significant at the $p < 0.01$ level. The odds ratio of this factor showed that a student was almost 21 times more likely to be in the perceived depression category if he or she had high levels of stress. Two other variables had significant odds ratios for predicting the perceived depression category. These were substance use (Chi Square value = 8.080, Odds Ratio = 2.885, and 95% C.I. = 1.390-5.990) and female gender (Chi Square value = 6.307, Odds Ratio = 2.172, and 95% C.I. = 1.186-3.979), both significant at the $p < 0.05$ level. Thus, those with substance abuse were about 3 times more likely to be categorized in the perceived depression group and females were about 2 times more likely to be in the perceived depression group.

Chapter 5

DISCUSSION

The purpose of this study was to determine the relationships between perceived stress and depression in college students. A retrospective cross-sectional correlation design was used to examine means and associations between stress levels, real depression, perceived depression, and various health behaviors. It was hypothesized that there would be a direct positive relationship between perceived stress and depression in college students at Arizona State University, and that the influence of health behaviors would mediate this relationship.

Demographic Characteristics

The basic demographics of the study sample were similar to what others have reported using the ACHA-NCHA or other surveys to assess health behaviors and outcomes in college students (Adams & Colner, 2008; Taliaferro et al., 2008; Dyson & Renk, 2006). The age of the participants was about the same in other studies, most using college undergraduates from 18-25 years old, in some cases ranging up to only 22 or 24 years (Adams & Colner, 2008; Taliaferro et al., 2008; Dyson & Renk, 2006). These studies also had samples that included more females than males. Mean BMI values were consistent with the other studies using the ACHA-NCHA and were within the “healthy” ranges (Adams & Colner, 2008; Taliaferro et al., 2008; Dyson & Renk, 2006). Other studies had a higher percentage of first, second, and fifth year students in their experiments, but lower proportions of third and fourth year undergraduates (Adams & Colner, 2008). Ethnicity categories were similar in other studies, including White, Black,

Hispanic, Asian, Indian, Other, and Mixed, most participants also reported being “White” in those articles (Adams & Colner, 2008; Taliaferro et al., 2008; Dyson & Renk, 2006). Relationship and marital status was similar; few affirmed that they were “married” and more reported being “single”. A majority of students in other studies observed that most subjects who lived on-campus were in a campus residence hall, while a larger percentage lived off campus (Adams & Colner, 2008; Taliaferro et al., 2008; Dyson & Renk, 2006).

It was noticed that students in this study were less physically active than in other studies. A report by Taliaferro and colleagues associating physical activity and depression indicated that 76.5% of their participants were active (Taliaferro et al., 2008). Only 69.2% of the subjects in this study were active (48.4% did low amounts of activity and 20.8% met the general recommendations of at least 3 days a week). Since the survey was administered in the spring in Phoenix, perhaps high temperatures may have discouraged students from exercise, reducing the amount of activity performed.

In contrast to other studies (Adams & Colner, 2008; Marshall et al., 2008; Taliaferro et al., 2008; Dyson & Renk, 2006; Larson, 2006), this study divided depression into two groups, real (i.e. diagnosed) and perceived. The ACHA-NCHA survey specifically asked questions about those who reported having been clinically diagnosed with and professionally treated for depression (i.e. real depression) and those who reported that they felt sadness, hopelessness, lonely, and overwhelmed (perceived depression). Taliaferro and colleagues (2008) created 3 separate groups of depression: hopelessness, depression, and suicidal

behavior (Taliaferro et al., 2008). Based on their methodology and outcomes, the variable depression would be equivalent to real depression in this study, and hopelessness would be relevant to perceived depression.

Findings

The main finding of this study was that there was a significant relationship between perceived stress and depression in college students. However, because the variables of stress were recoded into three distinct groups with the positive value highest (i.e. High stress = 1, Moderate stress = 2, and Low stress = 3), a direct inverse relationship was observed as opposed to a positive one as the original hypothesis stated. The mean results of this study show that people who had both real depression and perceived depression reported having high levels of stress, numerous academic responsibilities, a poor living situation, used prescriptions that belonged to someone else, and had either attempted or thought about suicide. The results provide empirical evidence that suggests that as the students' levels of stress decreased, so did the rate of depression. This was seen across all undergraduate students, regardless of the year in school. Therefore, as levels of stress increase, so does the prevalence of having both real and perceived depression. This correlation was stronger with perceived depression than it was for having real clinical depression. A reason for this may be linked to the fact that students who are not in therapy for depression but perceive themselves to be depressed report that they have more stress. Students who perceive themselves to be depressed but have no official or formal therapy to help them cope with their depression or stress may exacerbate their feelings of stress. In addition, perhaps

students cannot distinguish between feelings of depression and feelings of stress. This finding was substantiated by the logistic regression. The odds ratio for having moderate to high levels of stress and having perceived depression was very high (i.e. 20 times more likely) than for having real depression (about 2 times more likely).

Similar results were found by Larson and others (Adams & Colner, 2008; Marshall et al., 2008; Taliaferro et al., 2008; Sreeramareddy et al., 2007; Dyson & Renk, 2006; Larson, 2006), on levels of stress and onset of negative mental states (perceived depression). Larson noticed that all participants in her research experienced some degree of stress, as it was in this study. She recruited 48 undergraduate students to participate, all females aged 18-29 years old (mean age of 22 years). Participants answered survey questions via email pagers at various times throughout the day. Questions from the survey entailed what activity each participant was doing at the time of being paged, the complexity of the activity, what level of demand and skill it required (their level of involvement in the activity), and how stressful they rated it (Larson, 2006). Most of her subjects felt only mild levels of stress, whereas a majority of the college students in this study reported moderate to high levels of stress. These stress levels were caused by school activities, academics, socially challenging situations (i.e. friendships and relationships), lack of sleep, working for pay, and volunteering. In the Larson study, carrying a productive load, which is similar to being over-committed in this study, was also a strong stressor. The researcher reported that these stressors resulted in decreased focus and performance, (particularly in school and at work),

anxiety, social stress, relationship problems, and boredom (Larson, 2006). They also found that discomfort, feeling sadness and hopelessness were related to levels of stress (Larson, 2006). These outcomes were the same as the criteria for having perceived depression in this study.

Marshall and colleagues (2008) assessed the levels of stress and quality of life in third year undergraduate pharmacy students. They found that 62% of their students felt nervous or stressed every month, just as participants of this study felt moderate to high levels of stress within the last 30 days. Females reported having higher levels of perceived stress than their male counterparts, and affirmed that they had lower mental health. The researchers tested the mental health of nursing students versus the general population of the United States aged 18 and over. Nursing students (both genders) had significantly lower mental health levels than the general population due to high levels of stress from college. Main stressors consisted of school and academic demands, family and relationship issues, and work, which are the same as some of the stressors in this study. Marshall and colleagues even observed that many of these stress levels during the third year of college led to burnout in addition to the poor mental health (Marshall et al., 2008).

These findings add to the literature by verifying that high levels of stress in college students significantly influence experiencing depression. Having depression while in college can cause impediments in life, whether they are academic, social, physical, financial, or work related. The clear relationship observed between levels of stress and depression reinforces the need for clinicians to improve ways to help college students cope with stress.

The second main finding of this study was that certain health behaviors significantly influence the relationship between perceived stress and depression. Of all the health behaviors assessed, only substance abuse seemed to predict depression in this sample of college students. While prescription misuse and suicide were significant predictors for having real depression, the only behavior that significantly predicted perceived depression was substance use.

This study had results that partially supported the findings of Dyson and Renk (2006) in their experiment on depressive symptoms, stress, and coping in college students. They discovered that females use more emotion-based coping techniques, while males execute more problem-focused or avoidant-focused strategies to cope with stress. More importantly, they found that there was a significant combination of stress, coping strategies, and depressive symptomatology. It was shown that those who did not use any coping methods for high stress levels had higher depressive symptomatology than those who used various techniques. Avoidant coping strategies served as a strong predictor for increased stress levels. Using Dyson and Renk's definitions, the health behaviors of smoking, substance use, prescription misuse, poor nutrition habits, and sports participation found in this study, would be classified as problem-focused coping techniques (Dyson & Renk, 2006). Thus being more related to depressive symptomatology.

Another study by Sreeramareddy and colleagues (2007) on stressors, coping techniques, and psychological morbidity in students indicated that 20.9% of their study population experienced psychological morbidity, which included

decreased mental health, reduced focus ability, and increased depression.

However, those who engaged in health behaviors (even alcohol consumption) had no or a reduced level of psychological morbidity (Sreeramareddy et al., 2007). In their study as in the present study, causes of stress were similar (i.e. family expectation, issues with classes, exams, and beginning a career). The most common types of coping strategies reported in their research were self distraction, blaming, denial, venting, alcohol consumption, planning, and positive reframing. The results of this study seem to substantiate the current findings. Some health behaviors do mediate the relationship between perceived stress and depression.

The results from the current study showed low but significant inverse correlations between real depression with nutrition habits, prescription misuse, and suicide. These results may mean that poor nutrition habits (consuming a healthy diet, whole grains, low fat, drinking water, taking vitamins and supplements), taking prescription drugs that were not prescribed, or having thoughts of suicide significantly related to having depression. Additionally, levels of general health also had a significant inverse correlation to having real depression, meaning that as the level of general health decreases, the prevalence of having real depression increases. The logistic regression did not show any health behaviors that significantly predicted having real depression.

However, health behaviors seemed to influence perceived depression to a greater extent. Total physical activity level, the amount of sleep consumed each night, smoking, substance use, participation in sports, and attempting or thinking of suicide were all significantly correlated with perceived depression. It was

expected that physical activity would mediate the relationship between stress and depression, but this was not the outcome. In fact, physical activity levels were not predictive of perceived depression according to the logistic regression model. A possible explanation for may be that those who engage in physical activity also engage in behaviors that affect and confound their levels of stress, such as lack of sleep due to exams. Significant positive correlations were seen between physical activity level, sports, and perceived depression. In contrast, inverse relationships were shown between perceived depression and smoking, substance use, and suicide. Therefore, the results indicated that perhaps participants used coping behaviors such as smoking and using drugs as a way to successfully manage their depression. The finding that physical activity and sports had a weak but direct positive relationship to depression suggests that exercise or physical activity has little or no relationship in mediating or preventing perceived depression. In fact, these data suggest that those who report more physical activity are more likely to be depressed. Perhaps those who participate in high levels of physical activity or sport are overtraining, thereby increasing their level of stress and depression. The only significant behavior for having perceived depression in the logistic regression model was substance use. Thus, those who either use or misuse drugs/substances are more likely to be in the perceived depression category.

It is important to note that too few subjects reported having attempts or thoughts of suicide to make it a clinically meaningful variable to identify depression. A surprising result was that alcohol use was not a significant predictor for either type of depression. Since a majority of students drink (78.5%)

to cope with stress (87.4% reported being stressed), it is not clear why this variable was not predictive of depression or stress. Similar to physical activity, the students may engage in other behaviors that might have confounded the influence of drinking as a coping mechanism for stress. This can result in stress levels to remain high. Often the literature does discuss non-significant findings. Thus, it is not known if others have found similar results and just did not report them.

This study was unique in that in addition to responding to the standard ACHA-NCHA questions, participants also received an additional questionnaire from ASU Wellness. These supplemental questions assessed some factors in more detail (such as nutritional intake and physical activity levels) and allowed for more specific results that were related to ASU students. The questions determined that the students most commonly felt sadness, hopelessness, and loneliness as symptoms of perceived depression. They also confirmed in addition to the results of the ACHA-NCHA that causal factors of stress were academic responsibilities, current living situation, finances, and being overcommitted. Lastly, the questions verified that ASU students were less physically active than students in other studies.

The study by Taliaferro and colleagues was very comparable to this one. However, they observed that 65.4% of their subjects felt hopeless, in comparison to 93.4% of participants in this study that reported feeling sadness, hopelessness, loneliness, or being overwhelmed. The number of students classified in the depression category was 46.1% in their study, whereas only 29.7% of the students

attending ASU were classified as having real depression. Lastly, 11% of their (Taliaferro et al., 2008) subjects affirmed having suicidal behavior, while 9% of participants in this study had attempted or thought of suicide. The differences in results may be due to the way that the study identified depression. In this study, real depression was defined as anyone who had been diagnosed or clinically treated for depression, whereas perceived depression was anyone who reported feeling sadness, hopelessness, lonely, and overwhelmed. Clearly, if the real depressed were included in the perceived depressed, the numbers would be exaggerated.

Students cope with stress using various behaviors, but the results indicate that these factors do not seem to relieve their feelings of depression. The outcomes of this study demonstrate that regardless of coping behaviors, stress is very predictive of being categorized as feeling sad, lonely, overwhelmed, or hopeless.

Out of all of the variables that were significant with either real or perceived depression, only general health, levels of stress, gender, and substance use were predictive for putting a subject in either the real or perceived depression category (using the logistic regression model). Those with high levels of stress had an odds ratio of almost 2 times more likely to be considered clinically depressed. High stress was almost 21 times more likely to predict that a student will be in the perceived depression category. This may be due to students thinking that they had more stress than they do and were not using effective coping techniques. This can cause students to perceive stressors to have more of

an impact on their health than they actually did. Whereas those who have clinical depression received therapy and possibly medication, so their perception of stress is not embellished. In addition, they may cope with stressors better than those who are not receiving therapy or medication. As for gender, female students had about 2 times the chance of being in the perceived depression group than males. Females are known to be more reflective than males when it comes to interpreting their areas of stress (Dyson & Renk, 2006). It may be that females perceive their stressors as worse than they actually are, whereas perhaps males are more realistic about their cause of stress. However, it may be that males are either oblivious to their stress, or are reluctant to report it. Thus, although they have stress, they do not admit that they do.

While the relationships reported in this study were statistically significant, unfortunately, they may not have any clinical meaning or significance. In fact, there were very weak correlations between most of the behavioral outcomes and the dependent variables in this study. The outcomes of these overall logistic regression models showed that stress, general health, and substance use are important predictors for depression. Then perhaps depression levels in college students could be prevented or reduced by addressing the levels of stress, improving general health, and reducing substance abuse in this population.

Limitations

One of the major limitations to this study was that it only represented data from a single university population. This decreases the generalizability of results to other institutions or to different populace, as a majority of the general public do

not experience the same environment and stressors as college students, have different backgrounds, and various motivational factors. Since the sample only included young adults who currently attend college, therefore it excluded individuals who did not attend college. Administering a web-based survey via email also excluded the number of students who had not signed up for or accessed university email accounts. Using a retrospective cross-sectional study design presented only a one-time view of the relationships among all of the variables that were determined, eliminating the ability to observe these associations over a long period of time as a longitudinal study could. It also prevented the establishment of causal relationships through the analyses. The use of self-report questionnaires allowed for bias or distortion which may have affected the results of the research. Participants may not have remembered the accurate answers to particular questions or could have been influenced to answer in the same way as their friends (recall and social desirability biases). These are always consequences of using and relying on self-report questionnaires for collecting data.

Conclusions

The primary focus of this study was to determine the relationship between perceived stress and depression in an undergraduate student population. A second focus was to evaluate if the influence of health behaviors would mediate that relationship between stress and depression in college students. Both objectives were achieved, as this study found that there was a significant association between levels of stress and both real clinical depression and perceived depression. As the levels of stress increased, the prevalence of students who had

depression also increased. However, this relationship was displayed as an inverse correlation throughout this study due to the fact that all of the variables were recoded from a negative to positive numeric form. In addition, it was affirmed that certain variables did mediate the relationship between stress and depression. Levels of general health, nutrition habits, prescription misuse, and suicide altered the relationship between stress and real clinical depression. Other behaviors that correlated with perceived depression included smoking, substance use, and sports participation. Although engaging in physical activity and consuming alcohol while partying are common health behaviors that are frequently seen in college students to cope with stress, they did not result in significantly predicting depression. The overall outcomes of the study imply that students who have high levels of stress, misuse substances, and have poor general health are more likely to be depressed.

These findings support the use of developing and improving stress coping techniques for college students as a way to prevent and perhaps treat depression in college students. It is important to encourage students to carry out positive health behaviors for coping as opposed to negative ones. Aiding young people in developing these coping techniques to use during stressful situations can provide the opportunity to look and feel good, increase body image and self-esteem, academic and work performance, reduce the risk of depression and suicide, and improve quality-of-life. Also these changes need to be developed before negative behaviors become engrained and executed permanently.

Future research should continue to identify factors that may mediate the relationship between perceived stress and depression in college students. Investigation should also employ objective measures of stress. This would decrease the biases inherent in self-report questionnaires. Previous studies have provided significant evidence of stress being detrimental to one's health and can lead to depression and other negative outcomes. These preliminary results suggest that developing effective stress coping techniques is critical for reducing the incidence of depression in college students.

REFERENCES

- Adams, T. B., & Colner, W. (2008). The association of multiple risk factors with fruit and vegetable intake among a nationwide sample of college students. *Journal of American College Health, 56*(4), 455-461.
- American College Health Association. (2009). American College Health Association National College Health Assessment (ACHA-NCHA), Spring 2005 Reference Group Data Report (Abridged). *Journal of American College Health, 55*(1), 5-16.
- Andrews, B. & Wilding, J. M. (2004). The relation of depression and anxiety to life-stress and achievement in students. *British Journal of Psychology, 95*, 509-521.
- Angst, J. & Dobler-Mikola, A. (1984). The definition of depression. *Journal of Psychiatric Research, 18*(4), 401-406.
- Araas, T. (2008). *Associations of mindfulness, perceived stress, and health behaviors in college freshmen*. Arizona: Mesa.
- Arizona State University Wellness Department. (2009). Additional questions ACHA-NCHA. *Arizona State University*, 1-4.
- Arnett, J. (2004). *Emerging adulthood*. New York: Oxford University Press.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Boswell, W. R., Olson-Buchanan, J. B., & LePine, M. A. (2004). Relations between stress and work outcomes: the role of felt challenge, job control, and psychological strain. *Journal of Vocational Behavior, 64*, 165-181.
- Burke, J. (1991). Identity process and social stress. *American Sociological Review, 56*(6), 836-849.
- Chang, E. C. (1998). Does dispositional optimism moderate the relation between perceived stress and psychological well-being?: a preliminary investigation. *Personality and Individual Differences, 25*, 233-240.
- Cohen, S. (1996). Psychological stress, immunity, and upper respiratory infections. *Current Directions in Psychological Science, 5*(3), 86-90.

- Cohen, S. & Herbert, T. B. (1996). Health psychology: psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annual Review of Psychology, 47*, 113-142.
- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *JAMA, 298*(14). 1685-1687.
- Cohen, S., & Kamarck, T., Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396).
- Dyson, R., & Renk, K. (2006). Freshman adaptation to university life: depressive symptoms, stress, and coping. *Journal of Clinical Psychology, 62*(10), 1231-1244.
- Furr, S. R., Westefeld, J. S., McConnell, G. N., & Jenkins, J. M. (2001). Suicide and depression among college students: a decade later. *Professional Psychology: Research and Practice, 32*(1), 97-100.
- Gist, M. E., Mitchell, T. R. (1992). Self-Efficacy: A theoretical analysis of its determinants and malleability. *The Academy of Management Review, 17*(2), 183-211.
- Gochman, D. (1997). *Handbook of Health Behavior Research, Volume 1*. New York: Plenum Press.
- Goodman, E.D. (1993). *How to handle the stress of being a student*. Imprint, 40, 43.
- Halamandaris, K. F., & Power, K. G. (1999). Individual differences, social support and coping with the examination stress: a study of the psychosocial and academic adjustment of first year home students. *Personality and Individual Differences, 26*, 665-685.
- Hall, N. C., Chipperfield, J. G., Perry, R. P, Ruthig, J. C., & Goetz, T. (2006). Primary and secondary control in academic development: gender-specific implications for stress and health in college students. *Anxiety, Stress, and Coping, 19*(2), 189-210.
- Hayhoe, C. R., Leach, L. J., Turner, P. R., Bruin, M. J., & Lawrence, F. C. (2000). Differences in spending habits and credit use of college students. *The Journal of Consumer Affairs, 24*(1), 113-133.
- Jones, T. L. (2001). Definition of Stress. *Psychological Abstracts, 88*, 4964.

- Kasl, S. V. & Cobb, S. (1966). Health behavior, illness behavior and sick-role behavior. *Archives of Environmental Health, 12*, 246-266.
- Kunkel, A. (2008). Stress and academics: how demanding majors increase student stress. *Initial Forays into Psychological Science, 4*, 11-14.
- Larson, E. A. (2006) Stress in the lives of college women: “lots to do and not much time”. *Journal of Adolescent Research, 21(6)*, 579-606.
- Le Fevre, M., Kolt, G. S., & Matheny, J. (2006). Eustress, distress and their interpretation in primary and secondary occupational stress management interventions: which way first? *Journal of Managerial Psychology, 21(6)*, 547-565.
- Marshall, L. L., Pharm, D., Allison, A., Nykamp, D., Lanke, S. (2008). Perceived stress and quality of life among doctor of pharmacy students. *American Journal of Pharmaceutical Education, 72(6)*, 137-144.
- McEwen, B.S., & Sapolsky, R. M. (1995). Stress and cognitive function. *Current Opinion in Neurobiology, 5*, 205-216.
- Misra, R., & Castillo, L. (2004). Academic stress among college students: comparison of american and international students. *International Journal of Stress Management, 11(2)*, 132-148.
- Misra, R., & McKean, M. (2000) College students’ academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies, 16(1)*, 41-51.
- Murff, S. H. (2005). The impact of stress on academic success in college students. *Journal of the Association of the Black Nursing Faculty, 16(5)*, 102-104.
- Nonis, S. A., Hudson, G. I., Logan, L. B., & Ford, C. W. (1998). Influence of perceived control over time on college student’s stress and stress-related outcomes. *Research in Higher Education, 39(5)*, 587-605.
- Oppenheimer, B. T. (1984). Short-term small group intervention for college freshmen. *Journal of Counseling Psychology, 31(1)*, 45-53.
- Pruessner, J. C., Hellhammer, D. H., & Kirschbaum, C. (1999). Burnout, perceived stress, and cortisol responses to awakening. *Psychosomatic Medicine, 61*, 197-204.

- Reibel, D. K., Greeson, J. M., Brainard, G. C. & Rosenzweig, S. (2001). Mindfulness-based stress reduction and health-related quality of life in a heterogeneous patient population. *General Hospital Psychiatry*, 23, 183-192.
- Robert-McComb, J. (2001). *Eating disorders in women and children, prevention, stress, and treatment*. Florida: Boca Raton.
- Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: action self-efficacy and coping self-efficacy. *Health-Psychology*, 19, 487-495.
- Seligman, M. E., Friedman, R. J., & Katz, M. M. (1974). *Depression and learned helplessness. The psychology of depression: Contemporary theory and research*. Oxford: John Wiley & Sons.
- Selye, H. (1956). *The stress of life*. New York: McGraw-Hill Book Company.
- Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*, 21(6), 581-599.
- Sloan, R. P. & Bagiella, E. (2002). Claims about religious involvement and health outcomes. *Annals of Behavioral Medicine*, 24(1), 14-21.
- Sreeramareddy, C. T., Shankar, P.T., Binu, V.S., Mukhopadhyay, C., Ray, B., Menezes, R.G. (2007). Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of nepal. *BMC Medical Educational*, 7, 26-33.
- Suedfeld, P. (1997). Reactions to societal trauma: distress and/or eustress. *Political Psychology*, 18(4), 849-861.
- Taliaferro, L. A., Rienzo, B. A., Pigg, M., Miller, D., & Dodd, V. (2008). Associations between physical activity and reduced rates of hopelessness, depression, and suicidal behavior among college students. *Journal of American College Health*, 57(4), 427-435.
- Thoits, P. A. (1995). Stress, coping, and social support processes: where are we? what next?. *Journal of Health and Social Behavior*, 35, 53-79.
- Tice, D. M., & Baumeister, R. F. (1997). Longitudinal study of procrastination, stress, and health: the costs and benefits of dawdling. *Psychological Science*, 8(6), 454-458.

- Torres, J. B., & Solberg, V. S. (2001). Role of self-efficacy, stress, social integration, and family support in latino college student persistence and health. *Journal of Vocational Behavior*, 59, 53-63.
- Van Eck, M. Berkhof, H., Nicolson, N., & Sulon, J. (1996). The effects of perceived stress, traits, mood states, and stressful daily events on salivary cortisol. *Psychosomatic Medicine*, 58, 447-458.
- Vredenburg, K., O'Brien, E., & Krames, L. (1988). Depression in college students: personality and experimental factors. *Journal of Counseling Psychology*, 35(4), 419-425.
- Westefeld, J. S., & Furr, S. R. (1987). Suicide and depression among college students. *Professional Psychology: Research and Practice*, 18(2), 119-123.

APPENDIX A

HUMAN SUBJECTS INSTITUTIONAL REVIEW APPROVAL FORM



Box 873503
Tempe, AZ 85287-3503
480-965-6788 FAX: 480-965-7772

ARIZONA STATE UNIVERSITY
Office of Human Research Administration
Vice President for Research and Economic Affairs

HS# 06542-02

Principal Investigator: **KAREN MOSES**

Co-Investigator(s): Original Approval Date: **3 /22/2000**

Department: **Student Health and Wellness Center** Most Recent Approval Date **3 /31/2004**

Title: **NATIONAL COLLEGE HEALTH ASSESSMENT/STUDENT HEALTH ASSESS**

From: Dr. Carol Nemeroff, Chair
Thursday, April 01, 2004

The Human Subjects Institutional Review Board has approved your request for continuation of the above-referenced project, with the understanding there have been no substantive changes since previously approved by the Board.

The IRB would like to remind you that federal regulations require investigators to immediately report to the Board any complaints, incidents, or injuries that may occur as part of the project.

Project directors are responsible for maintaining auditable files. Please sign below indicating your willingness to comply with these procedures, and return one copy with original signature to Karol Householder at the Office of Human Research Administration (mail code 3503) for our files.

Thank you for your cooperation.

vsc

Karen J Moses
Signature

8-19-04
Date

APPENDIX B
EMAIL RECRUITMENT LETTER

Dear ASU Student:

You have been randomly selected to participate in the National College Health Assessment Web survey (NCHA-Web) sponsored by the American College Health Association (ACHA). The NCHA-Web is a survey designed to assess student health behaviors in order to provide better services and support for Arizona State University (ASU) students. You may benefit by knowing that you have assisted in providing accurate information regarding health behaviors on your campus. The information will be used to develop health and wellness programs at ASU and may be used in reports, presentations, and publications, but you will not be identified.

The NCHA-Web is completed online via the Internet. You may scroll through the survey as you fill it out. We encourage you to complete the survey in one sitting, which typically takes about 20-30 minutes.

Your participation is completely voluntary and confidential. Your name or email address will never be associated with your survey responses. You may answer only some questions, or you may choose not to participate in the survey at all.

You have been assigned a unique ID number in order for the secure Internet server to manage your online survey input. This number is imbedded in your URL address. To ensure your confidentiality, the file associating unique ID numbers with e-mail addresses is destroyed before data are compiled and shared with ASU.

Upon submission of your survey, you will automatically be entered in a prize drawing. Prizes include:

- **(10) - \$200 added to your ASU Sun Card.**

(Please visit <http://www.suncard1.com/> for a list of places you can use your Sun Card.)

If you are drawn as a winner in the prize drawing, you will be emailed directions on how to claim your prize at the Wellness and Health Promotion office on the Tempe Campus. Even as a prize winner, there will be no connection between your personally identifiable information and your survey responses.

Your unique ID will be used for the prize drawing process. When the survey is closed, survey administrators will randomly select ten unique IDs. They will then go back to the file and identify the e-mail addresses associated with those unique IDs. Those students will be contacted via their email address informing them that they have been randomly selected as one of the winners for the drawing prizes. The file associating the unique IDs with email addresses is destroyed after surveying is completed. The unique ID is stripped from the survey data file before the data are compiled. Personally identifiable information will never be associated with your survey responses. If you do not want to participate in the prize drawing, please email wellness@asu.edu.

Data transmission is encrypted and firewall securities are in place. After you submit the survey to the secure server, you will receive a message thanking you for taking the NCHA-Web. **The final survey responses are housed at ACHA and the version of the data set that is forwarded to ASU does not include personal identification such as e-mail addresses or unique ID numbers.**

More directions follow as you link to the web site. By linking to the survey web site you are acknowledging that you are 18 years of age or older, and you are agreeing to participate in the NCHA-Web. Students that have not submitted the survey within one week of this invitation will receive an email reminder. Only one reminder will be sent out.

If you agree to participate in the ACHA NCHA-Web survey, click on the following Internet address to continue:

[URL HERE]

You can obtain further information from the principal investigator, Karen Moses, at ASU Wellness and Health Promotion, wellness@asu.edu or 480.965.4721. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Research Compliance Office, at 480. 965.6788.

There may be some personal discomfort with the content of certain questions. For example, there are questions regarding substance use and sexual behavior. The following ASU resources are available to assist you:

Counseling Centers at ASU

- <http://students.asu.edu/counseling>

ASU Health Services

- <http://students.asu.edu/health>

ASU Wellness & Health Promotion

- <http://www.asu.edu/studentaffairs/wellness>

Thank you for you cooperation!

ASU Wellness & Health Promotion &
American College Health Association

73 APPENDIX C

AMERICAN COLLEGE HEALTH ASSOCIATION NATIONAL COLLEGE
HEALTH ASSESSMENT (ACHA-NCHA)

73

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.

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!***



American College Health Association

National College Health Assessment

Copyright © 2008 American College Health Association

PAGE ONE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

Health, Health Education and Safety

1. How would you describe your general health?

- Excellent
 Very good
 Good
 Fair
 Poor
 Don't know

(Please mark the appropriate column for each question to the right)

2. Have you received information on the following topics from your college or university?

3. Are you interested in receiving information on the following topics from your college or university?

	No	Yes	No	Yes
Alcohol and other drug use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold/Flu/Sore throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression/Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating disorders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grief and loss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to help others in distress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutrition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pregnancy prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem use of Internet/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual assault/Relationship violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease/infection (STD/I) prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suicide prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Within the last 12 months, how often did you:

(Please mark the appropriate column for each row)

Always
 Most of the time
 Sometimes
 Rarely
 Never
 N/A, did not do this activity within the last 12 months

	Always	Most of the time	Sometimes	Rarely	Never	N/A, did not do this activity within the last 12 months
Wear a seatbelt when you rode in a car?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input 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"/>	<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"/>	<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"/>	<input type="radio"/>

5. Within the last 12 months:

(Please mark the appropriate column for each row)

Yes
No

	Yes	No
Were you in a physical fight?	<input type="radio"/>	<input type="radio"/>
Were you physically assaulted (do not include sexual assault)?	<input type="radio"/>	<input type="radio"/>
Were you verbally threatened?	<input type="radio"/>	<input type="radio"/>
Were you sexually touched without your consent?	<input type="radio"/>	<input type="radio"/>
Was sexual penetration attempted (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you sexually penetrated (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you a victim of stalking (e.g., waiting for you outside your classroom, residence, or office; repeated emails/phone calls)?	<input type="radio"/>	<input type="radio"/>

9. Within the last 30 days, how often do you think the typical student at your school used:

(State your best estimate; Please mark the appropriate column for each row)

	Have used, but not in last 30 days	Never used	1-2 days	3-5 days	6-9 days	10-19 days	20-29 days	Used daily
--	------------------------------------	------------	----------	----------	----------	------------	------------	------------

Cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco from a water pipe (hookah)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigars, little cigars, clove cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smokeless tobacco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcohol (beer, wine, liquor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marijuana (pot, weed, hashish, hash oil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine (crack, rock, freebase)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methamphetamine (crystal meth, ice, crank)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other amphetamines (diet pills, bennies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedatives (downers, ludes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hallucinogens (LSD, PCP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anabolic steroids (Testosterone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opiates (heroin, smack)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhalants (glue, solvents, gas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MDMA (Ecstasy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other club drugs (GHB, Ketamine, Rohypnol)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

One drink of alcohol is defined as a 12 oz. can or bottle of beer or wine cooler, a 4 oz. glass of wine, or a shot of liquor straight or in a mixed drink.

10. The last time you "partied"/socialized how many drinks of alcohol did you have? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="text"/>
R	<input type="text"/>
I	<input type="text"/>
N	<input type="text"/>
K	<input type="text"/>
S	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>

11. The last time you "partied"/socialized over how many hours did you drink alcohol? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

H	<input type="text"/>
O	<input type="text"/>
U	<input type="text"/>
R	<input type="text"/>
S	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>

12. How many drinks of alcohol do you think the typical student at your school had the last time he/she "partied"/socialized? (If you think the typical student at your school does not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="text"/>
R	<input type="text"/>
I	<input type="text"/>
N	<input type="text"/>
K	<input type="text"/>
S	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>

13. Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?

- N/A, don't drink
 2 times
 5 times
 8 times
 None
 3 times
 6 times
 9 times
 1 time
 4 times
 7 times
 10 or more times

14. Within the last 30 days, did you:

(Please mark the appropriate column for each row)

	Yes	No	N/A, don't drink	N/A, don't drive
--	-----	----	------------------	------------------

Drive after drinking any alcohol at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive after drinking five or more drinks of alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sex Behavior and Contraception

19. Within the **last 12 months**, with how many partners have you had oral sex, vaginal intercourse, or anal intercourse? (If you did not have a sex partner within the last 12 months, please enter 00. If less than 10, enter 01, 02, 03, etc.)

P		
A	0	0
R	1	1
T	2	2
N	3	3
E	4	4
R	5	5
S	6	6
	7	7
	8	8
	9	9

20. Within **last 12 months**, did you have sexual partner(s) who were:

(Please mark the appropriate column for each row)

	Yes	No
Female	<input type="radio"/>	<input type="radio"/>
Male	<input type="radio"/>	<input type="radio"/>
Transgender	<input type="radio"/>	<input type="radio"/>

21. Within the **last 30 days**, did you have:

(Please mark the appropriate column for each row)

	Yes	No, have done this sexual activity in the past but not in the last 30 days	No, have never done this sexual activity
Oral sex?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Within the **last 30 days**, how often did you or your partner(s) use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

(Please mark the appropriate column for each row)

	Have not done this sexual activity during the last 30 days	N/A, never did this sexual activity	Never	Rarely	Sometimes	Most of the time	Always	CONDOM/BARRIER USE
Oral sex?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23A. Did you or your partner use a method of birth control to prevent pregnancy **the last time** you had vaginal intercourse?

- Yes (continue to item 23B)
- N/A, have not had vaginal intercourse (skip to item 24)
- No, have not had vaginal intercourse that could result in a pregnancy (skip to item 24)
- No, did not want to prevent pregnancy (skip to item 24)
- No, did not use any birth control method (skip to item 24)
- Don't know (skip to item 24)

23B. Please indicate whether or not you or your partner used each of the following methods of birth control to prevent pregnancy **the last time** you had vaginal intercourse. (Please mark the appropriate column for each row)

	Yes	No		Yes	No
Birth control pills (monthly or extended cycle)	<input type="radio"/>	<input type="radio"/>	Diaphragm or cervical cap	<input type="radio"/>	<input type="radio"/>
Birth control shots	<input type="radio"/>	<input type="radio"/>	Contraceptive sponge	<input type="radio"/>	<input type="radio"/>
Birth control implants	<input type="radio"/>	<input type="radio"/>	Spermicide (e.g., foam, jelly, cream)	<input type="radio"/>	<input type="radio"/>
Birth control patch	<input type="radio"/>	<input type="radio"/>	Fertility awareness (e.g., calendar, mucous, basal body temperature)	<input type="radio"/>	<input type="radio"/>
Vaginal ring	<input type="radio"/>	<input type="radio"/>	Withdrawal	<input type="radio"/>	<input type="radio"/>
Intrauterine device (IUD)	<input type="radio"/>	<input type="radio"/>	Sterilization (e.g., hysterectomy, tubes tied, or vasectomy)	<input type="radio"/>	<input type="radio"/>
Male condom	<input type="radio"/>	<input type="radio"/>	Other method	<input type="radio"/>	<input type="radio"/>
Female condom	<input type="radio"/>	<input type="radio"/>			

24. Within the last 12 months, have you or your partner(s) used emergency contraception ("morning after pill")?

- N/A, have not had vaginal intercourse in the last 12 months
- No
- Yes
- Don't know

25. Within the last 12 months, have you or your partner(s) become pregnant?

- N/A, have not had vaginal intercourse in the last 12 months
- No
- Yes, unintentionally
- Yes, intentionally
- Don't know

Weight, Nutrition, and Exercise

26. How do you describe your weight?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

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

- I am not trying to do anything about my weight
- Stay the same weight
- Lose weight
- Gain weight

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

- 0 servings per day
- 1-2 servings per day
- 3-4 servings per day
- 5 or more servings per day

29. On how many of the past 7 days did you:

(Please mark the appropriate column for each row)

- Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) for at least 30 minutes?
- Do vigorous-intensity cardio or aerobic exercise (caused large increases in breathing or heart rate, such as jogging) for at least 20 minutes?
- Do 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) 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 vigorous-intensity cardio or aerobic exercise (caused large increases in breathing or heart rate, such as jogging) for at least 20 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 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Mental Health

30. Have you ever:

(Please mark the appropriate column for each row)

- Felt things were hopeless
- Felt overwhelmed by all you had to do
- Felt exhausted (not from physical activity)
- Felt very lonely
- Felt very sad
- Felt so depressed that it was difficult to function
- Felt overwhelming anxiety
- Felt overwhelming anger
- Intentionally cut, burned, bruised, or otherwise injured yourself
- Seriously considered suicide
- Attempted suicide

	No, never	No, not in last 12 months	Yes, in the last 2 weeks	Yes, in the last 30 days	Yes, in the last 12 months
Felt things were hopeless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all you had to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt exhausted (not from physical activity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt so depressed that it was difficult to function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intentionally cut, burned, bruised, or otherwise injured yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seriously considered suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attempted suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. Have you ever received psychological or mental health services from your **current** college/university's Counseling or Health Service?
 No Yes

36. If in the future you were having a personal problem that was really bothering you, would you consider seeking help from a mental health professional?
 No Yes

37. Within the **last 12 months**, how would you rate the overall level of stress you have experienced?
 No stress
 Less than average stress
 Average stress
 More than average stress
 Tremendous stress

Physical Health

38. Within the **last 30 days**, did you do any of the following?
 (Please mark the appropriate column for each row)

	No	Yes
Exercise to lose weight	<input type="radio"/>	<input type="radio"/>
Diet to lose weight	<input type="radio"/>	<input type="radio"/>
Vomit or take laxatives to lose weight	<input type="radio"/>	<input type="radio"/>
Take diet pills to lose weight	<input type="radio"/>	<input type="radio"/>

39. Have you:
 (Please mark the appropriate column for each row)

	No	Yes	Don't know
Had a dental exam and cleaning in the last 12 months ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Males) Performed testicular self exam in the last 30 days ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Females) Performed breast self exam in the last 30 days ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Females) Had a routine gynecological exam in the last 12 months ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used sunscreen regularly with sun exposure?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ever been tested for Human Immunodeficiency Virus (HIV) infection?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. Have you received the following vaccinations (shots)?
 (Please mark the appropriate column for each row)

	No	Yes	Don't know
Hepatitis B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human Papillomavirus/HPV (cervical cancer vaccine)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influenza (the flu) in the last 12 months (shot or nasal mist)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Measles, Mumps, Rubella	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meningococcal disease (meningococcal meningitis)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Varicella (chicken pox)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Impediments to Academic Performance

(Please select the most serious outcome for each item below)

Significant disruption in thesis, dissertation, research, or practicum work
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

45. Within the last 12 months, have any of the following affected your academic performance?

Alcohol use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allergies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assault (physical)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assault (sexual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attention Deficit and Hyperactivity Disorder (ADHD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold/Flu/Sore throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concern for a troubled friend or family member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic health problem or serious illness (e.g., diabetes, asthma, cancer)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Death of a friend or family member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discrimination (e.g., homophobia, racism, sexism)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drug use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating disorder/problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gambling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Homesickness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury (fracture, sprain, strain, cut)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet use/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning disability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation in extracurricular activities (e.g., campus clubs, organizations, athletics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pregnancy (yours or your partner's)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roommate difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease/infection (STD/I)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sinus infection/Ear infection/Bronchitis/Strep throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work	<input type="radio"/>	<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"/>	<input type="radio"/>

Demographic Characteristics

<p>46. How old are you? →</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Years</td> <td style="width: 20px; border: 1px solid black; text-align: center;"> </td> <td style="width: 20px; border: 1px solid black; text-align: center;"> </td> </tr> <tr> <td><input type="radio"/> 1</td> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> </tr> <tr> <td><input type="radio"/> 2</td> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> </tr> <tr> <td><input type="radio"/> 3</td> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> </tr> <tr> <td><input type="radio"/> 4</td> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> </tr> <tr> <td><input type="radio"/> 5</td> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> </tr> <tr> <td><input type="radio"/> 6</td> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> </tr> <tr> <td><input type="radio"/> 7</td> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> </tr> <tr> <td><input type="radio"/> 8</td> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> </tr> <tr> <td><input type="radio"/> 9</td> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> </tr> </table>	Years			<input type="radio"/> 1	1	1	<input type="radio"/> 2	2	2	<input type="radio"/> 3	3	3	<input type="radio"/> 4	4	4	<input type="radio"/> 5	5	5	<input type="radio"/> 6	6	6	<input type="radio"/> 7	7	7	<input type="radio"/> 8	8	8	<input type="radio"/> 9	9	9	<p>49. What is your height in feet and inches? ▶</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 20px; text-align: center;">Ft.</td> <td style="width: 20px; text-align: center;">Inch</td> </tr> <tr> <td style="text-align: center;">HEIGHT</td> <td style="text-align: center;">HEIGHT</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> </tr> </table>	Ft.	Inch	HEIGHT	HEIGHT	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	<p>50. What is your weight in pounds? →</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">WEIGHT</td> <td style="width: 20px; border: 1px solid black; text-align: center;"> </td> <td style="width: 20px; border: 1px solid black; text-align: center;"> </td> <td style="width: 20px; border: 1px solid black; text-align: center;"> </td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> <td style="border: 1px solid black; text-align: center;">1</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> <td style="border: 1px solid black; text-align: center;">2</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> <td style="border: 1px solid black; text-align: center;">3</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> <td style="border: 1px solid black; text-align: center;">4</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> <td style="border: 1px solid black; text-align: center;">5</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> <td style="border: 1px solid black; text-align: center;">6</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> <td style="border: 1px solid black; text-align: center;">7</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> <td style="border: 1px solid black; text-align: center;">8</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> <td style="border: 1px solid black; text-align: center;">9</td> </tr> </table>	WEIGHT				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9
Years																																																																																														
<input type="radio"/> 1	1	1																																																																																												
<input type="radio"/> 2	2	2																																																																																												
<input type="radio"/> 3	3	3																																																																																												
<input type="radio"/> 4	4	4																																																																																												
<input type="radio"/> 5	5	5																																																																																												
<input type="radio"/> 6	6	6																																																																																												
<input type="radio"/> 7	7	7																																																																																												
<input type="radio"/> 8	8	8																																																																																												
<input type="radio"/> 9	9	9																																																																																												
Ft.	Inch																																																																																													
HEIGHT	HEIGHT																																																																																													
1	1																																																																																													
2	2																																																																																													
3	3																																																																																													
4	4																																																																																													
5	5																																																																																													
6	6																																																																																													
7	7																																																																																													
8	8																																																																																													
9	9																																																																																													
WEIGHT																																																																																														
1	1	1	1																																																																																											
2	2	2	2																																																																																											
3	3	3	3																																																																																											
4	4	4	4																																																																																											
5	5	5	5																																																																																											
6	6	6	6																																																																																											
7	7	7	7																																																																																											
8	8	8	8																																																																																											
9	9	9	9																																																																																											
<p>47. What is your gender?</p> <p><input type="radio"/> Female</p> <p><input type="radio"/> Male</p> <p><input type="radio"/> Transgender</p>																																																																																														
<p>48. What is your sexual orientation?</p> <p><input type="radio"/> Heterosexual</p> <p><input type="radio"/> Gay/Lesbian</p> <p><input type="radio"/> Bisexual</p> <p><input type="radio"/> Unsure</p>																																																																																														

51. What is your year in school?
- 1st year undergraduate
 - 2nd year undergraduate
 - 3rd year undergraduate
 - 4th year undergraduate
 - 5th year or more undergraduate
 - Graduate or professional
 - Not seeking a degree
 - Other
52. What is your enrollment status?
- Full-time
 - Part-time
 - Other
53. Have you transferred to this college or university within the last 12 months?
- No
 - Yes
54. How do you usually describe yourself?
(Mark all that apply)
- White, non Hispanic (includes Middle Eastern)
 - Black, non Hispanic
 - Hispanic or Latino/a
 - Asian or Pacific Islander
 - American Indian, Alaskan Native, or Native Hawaiian
 - Biracial or Multiracial
 - Other
55. Are you an international student?
- No
 - Yes
56. What is your relationship status?
- Not in a relationship
 - In a relationship but not living together
 - In a relationship and living together
57. What is your marital status?
- Single
 - Married/Partnered
 - Divorced
 - Other
 - Separated
58. Where do you currently live?
- Campus residence hall
 - Fraternity or sorority house
 - Other college/university housing
 - Parent/guardian's home
 - Other off-campus housing
 - Other
59. Are you a member of a social fraternity or sorority?
(e.g., National Interfraternity Conference, National Panhellenic Conference, National Pan-Hellenic Council, National Association of Latino Fraternal Organizations)
- No
 - Yes

60. How many hours a week do you work for pay?
- 0 hours
 - 1–9 hours
 - 10–19 hours
 - 20–29 hours
 - 30–39 hours
 - 40 hours
 - More than 40 hours
61. How many hours a week do you volunteer?
- 0 hours
 - 1–9 hours
 - 10–19 hours
 - 20–29 hours
 - 30–39 hours
 - 40 hours
 - More than 40 hours
62. What is your primary source of health insurance?
- My college/university sponsored plan
 - My parents' plan
 - Another plan
 - I don't have health insurance
 - I am not sure if I have health insurance
63. What is your approximate cumulative grade average?
- A
 - B
 - C
 - D/F
 - N/A
64. Within the last 12 months, have you participated in organized college athletics at any of the following levels?
- (Please mark the appropriate column for each row)
- | | Yes | No |
|-------------|-----------------------|-----------------------|
| Varsity | <input type="radio"/> | <input type="radio"/> |
| Club sports | <input type="radio"/> | <input type="radio"/> |
| Intramurals | <input type="radio"/> | <input type="radio"/> |
65. Do you have any of the following disabilities or medical conditions?
- (Please mark the appropriate column for each row)
- | | Yes | No |
|-----------------------------------------------------------------|-----------------------|-----------------------|
| Attention Deficit and Hyperactivity Disorder (ADHD) | <input type="radio"/> | <input type="radio"/> |
| Chronic illness (e.g., cancer, diabetes, auto-immune disorders) | <input type="radio"/> | <input type="radio"/> |
| Deaf/Hard of hearing | <input type="radio"/> | <input type="radio"/> |
| Learning disability | <input type="radio"/> | <input type="radio"/> |
| Mobility/Dexterity disability | <input type="radio"/> | <input type="radio"/> |
| Partially sighted/Blind | <input type="radio"/> | <input type="radio"/> |
| Psychiatric condition | <input type="radio"/> | <input type="radio"/> |
| Speech or language disorder | <input type="radio"/> | <input type="radio"/> |
| Other disability | <input type="radio"/> | <input type="radio"/> |

THANK YOU FOR COMPLETING THIS SURVEY

PAGE TWELVE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

APPENDIX D

ADDITIONAL QUESTIONNAIRE TO THE 2009 ACHA-NCHA

Arizona State University

1. Currently, at which ASU campus do you primarily attend classes?
 - a. Phoenix Downtown
 - b. Polytechnic
 - c. Tempe
 - d. West
 - e. Online only
 - f. Other, please specify:

2. What ASU College are you affiliated with?
 - a. Barrett, The Honors College
 - b. College of Design
 - c. College of Liberal Arts and Sciences
 - d. College of Nursing & Healthcare Innovation
 - e. College of Public Programs
 - f. College of Teacher Education and Leadership
 - g. College of Teacher Education and Leadership
 - h. College of Technology and Innovation
 - i. College of the Arts, Katherine K. Herberger
 - j. Graduate College
 - k. Ira A. Fulton School of Engineering
 - l. Mary Lou Fulton College of Education
 - m. Morrison School of Management and Agribusiness
 - n. New College of Interdisciplinary Arts and Sciences
 - o. Sandra Day O'Connor College of Law
 - p. School of Applied Arts and Sciences
 - q. School of Educational Innovation and Teacher Preparation
 - r. School of Letters and Sciences
 - s. School of Sustainability
 - t. University College
 - u. W. P. Carey School of Business
 - v. Walter Cronkite School of Journalism and Mass Communication
 - w. Other: please specify:

3. What is your major? If you have not chosen a major, please answer, "undecided".

4. Do you plan on returning to ASU in the Fall of 2009?
 - a. Yes
 - b. No
 - c. Not sure

Skip logic: If yes to question 4 – skip to question 8
If no or not sure to question 4 – skip to question 5

5. Do you plan on attending another university/college in the Fall of 2009?
 - a. Yes
 - b. No
 - c. Not sure

6. When did you decide to leave ASU?
 - a. Before arriving at ASU
 - b. After arriving at ASU
 - c. Have not decided yet

7. If leaving ASU, is it due to medical or mental health reasons?
 - a. No
 - b. Yes

8. Have you registered for Fall 2009 classes at ASU?
 - a. No
 - b. Yes
 - c. In process

9. Have you ever received information from ASU about developing a healthy body image?
 - a. No
 - b. Yes

10. Have you ever received information from ASU about HIV or AIDS prevention?
 - a. No
 - b. Yes

11. Within the last 12 months, have any of the following affected your academic performance? (Please select the most serious outcome for each item below):

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

- a. Back pain
 - b. Someone else's drinking/partying behavior
 - c. Video games
 - d. Over committed (not enough time for everything you need to do)
-
12. Within the last 12 months how many times have you:

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

 - a. Felt things were hopeless
 - b. Felt overwhelmed by all you had to do
 - c. Felt exhausted (not from physical activity)
 - d. Felt very lonely
 - e. Felt very sad
 - f. Felt so depressed it was difficult to function
 - g. Felt overwhelming anxiety
 - h. Felt overwhelming anger
 - i. Intentionally cut, burned, or otherwise injured yourself
 - j. Seriously considered suicide
 - k. Attempted suicide

13. Within the last 12 months, to what extent did the following make you feel stressed?

Did not experience this/ not applicable; I have experienced this, but it did not affect my stress level; Low effect on my stress level; Moderate effect on my stress level; High effect on my stress level; Very high effect on my stress level

- a. Academic processes (buying books, getting forms signed, etc.)
- b. Academic responsibilities
- c. Career related issues
- d. Concern about your physical appearance
- e. Current living situation
- f. Death of a family member or friend
- g. Family problems
- h. Finances
- i. Friends
- j. Intimate relationship(s)
- k. Over committed (not enough time for everything you need to do)
- l. Personal emotional issues
- m. Personal health issues
- n. Problem with drugs or alcohol
- o. Roommate difficulties
- p. Sleep difficulties
- q. Work commitments

14. Within the last school year, to what extent did you do a good job managing stress?

- a. Did not experience stress/ not applicable
- b. Did a poor job managing stress
- c. Did a fair job managing stress
- d. Did a good job managing stress
- e. Did an outstanding job managing stress

15. This year, how often did **you**:

Never; Rarely; Sometimes; Usually; Always

- a. Worry about your physical appearance
- b. Avoid foods and beverages with poor nutritional value
- c. Avoid saturated fats (meat and dairy fats)
- d. Eat a variety of nutritious foods from each food group daily
- e. Take a multivitamin daily
- f. Eat at least 6 servings of grain products a day
- g. Eat at least 3 servings of whole grain products a day
- h. Consume at least 3 servings of dairy a day (milk, cheese, yogurt)
- i. Take a calcium supplement daily

16. Do you think it is important to eat healthy daily?

- a. No
- b. Yes
- c. Not sure

17. Do you think it is important to engage in daily physical activity?
- No
 - Yes
 - Not sure
18. In general, when you look in the mirror and evaluate your body, are you:
- Pleased
 - Accepting
 - Disappointed
 - Disgusted
 - Other: please specify
19. Within the last 12 months, with how many partners do you think **the typical student at your school** had oral sex, vaginal intercourse, or anal intercourse with?
20. If you were sexually active within the last 30 days, did you use a condom or other protective barrier **the last time** you had:
- Have not done this activity during the last 30 days; No; Yes*
- Oral sex?
 - Vaginal intercourse?
 - Anal intercourse?
21. What percentage of the typical students at your school do you think had sex (oral sex, vaginal intercourse, or anal intercourse) within the last 30 days?
- Oral sex?
 - Vaginal intercourse?
 - Anal intercourse?
22. Of the typical students at your school who had sex within the last 30 days, what percentage do you think used a condom or other protective barrier **the last time** they had:
- Oral sex?
 - Vaginal intercourse?
 - Anal intercourse?
23. Have you made any plans or taken any action to prepare yourself for the pandemic flu? (For example, food and water storage, first aid kit including decongestants and fever reducers, communication plans.)
- No
 - Yes

24. Why did you choose to complete this health survey? Choose the reason that most affected your decision.
- a. To improve wellness and health programs and services for ASU students
 - b. For a chance to win a prize
 - c. To have my voice heard
 - d. Because research is important
 - e. Because I like surveys
 - f. Because it is my responsibility as an ASU student
 - g. Other: please specify:

APPENDIX E
LOGISTIC REGRESSION TABLES

Final model for binary logistic regression of real depression associated with attributing variables

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.
Age (years)	0.008	0.266	0.001	1	0.977	1.008	0.598-1.697
Gender	0.193	0.150	1.653	1	0.199	1.213	0.904-1.628
General Health	1.186	0.491	5.848	1	0.016	3.275	1.252-8.565
Level of Stress	0.609	0.244	6.250	1	0.012	1.839	1.141-2.966
Total Physical Activity	-0.126	0.205	0.376	1	0.540	0.882	0.590-1.318
Number of Fruits/Vegetables (per day)	-0.199	0.167	1.424	1	0.233	0.819	0.590-1.137
Nutrition Habits	0.272	0.152	3.181	1	0.075	1.312	0.973-1.769
Smoking	0.292	0.180	2.651	1	0.103	1.340	0.942-1.905
Substance Use	-0.105	0.175	0.357	1	0.550	0.901	0.639-1.269
Prescription Misuse	0.304	0.161	3.550	1	0.060	1.355	0.988-1.859
Frequency of Alcohol (in last 30 days)	-0.152	0.217	0.490	1	0.484	0.859	0.561-1.315
Participation in Sports	0.065	0.180	0.131	1	0.718	1.067	0.750-1.518
Work for Pay (hours per wk)	0.013	0.251	0.003	1	0.958	1.013	0.619-1.658

Note. B = value for the logistic regression equation. S.E. = the standard error. Wald = Wald chi-square value. df = the degree of freedom. Sig. = 2-tailed p-value. Exp(B) = odds ratio. C.I. = 95% confidence interval.

Final model for binary logistic regression of perceived depression associated with attributing variables

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.
Age (years)	0.524	0.474	1.221	1	0.269	1.688	0.667-4.273
Gender	0.776	0.309	6.307	1	0.012	2.172	1.186-3.979
General Health	18.4	8248.132	0.000	1	0.998	1.035E8	0.000-0.000
Level of Stress	3.037	0.390	60.600	1	0.000	20.837	9.700-44.760
Total Physical Activity	-0.538	0.507	1.126	1	0.289	0.584	0.216-1.578
Number of Fruits/Vegetables (per day)	0.307	0.312	0.968	1	0.325	1.359	0.737-2.506
Nutrition Habits	0.058	0.298	0.038	1	0.846	1.059	0.591-1.898
Smoking	0.078	0.341	0.052	1	0.820	1.081	0.554-2.110
Substance Use	1.060	0.373	8.080	1	0.004	2.885	1.390-5.990
Prescription Misuse	0.142	0.363	0.153	1	0.696	1.152	0.566-2.345
Frequency of Alcohol (in last 30 days)	0.195	0.374	0.271	1	0.603	1.215	0.584-2.529
Participation in Sports	-0.261	0.314	0.691	1	0.406	0.770	0.416-1.426
Work for Pay (hours per wk)	-0.078	0.529	0.022	1	0.882	0.925	0.328-2.608

Note. B = value for the logistic regression equation. S.E. = the standard error. Wald = Wald chi-square value. df = the degree of freedom. Sig. = 2-tailed p-value. Exp(B) = odds ratio. C.I. = 95% confidence interval.

