PREDICTIVE RELATIONSHIP OF POSITIVE LIFESTYLE CHOICES WITH EMOTIONAL DISTRESS OF UNDERGRADUATE COLLEGE STUDENTS: AN ANALYSIS OF AMERICAN COLLEGE HEALTH ASSOCIATION DATA

by

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Abstract

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Undergraduate student reports of anxiety and depression have risen each year since 2012 to the most recent report of 17% experiencing anxiety and 14% experiencing depression (ACHA, 2016). Experiencing anxiety and depression in this population is significant because these two emotional responses are the most frequently reported factors affecting academic attrition (ACHA, 2016).

The purpose of this study was to examine the predictive relationship of three healthy lifestyle behaviors and emotional distress among undergraduate college students. The three healthy lifestyle choices examined were nutrition, exercise, and rest. The prevalence of emotional distress and depression within

each of year of study also was examined and the prevalence of academic performance being impeded by stress, anxiety, or depression.

This study, a descriptive correlational design, was a secondary data analysis of data collected by the American College Health Association (ACHA) during the spring 2008 semester. The data included 68,588 undergraduate student responses. The data were collected using the National College Health Assessment (NCHA) tool (ACHA, 2008). Emotional distress was measured with a scale embedded within the NCHA. Hamilton (2006) performed confirmatory factor analysis on this scale.

The predictor variables were measured as student reports of number of servings of fruits and vegetables consumed, days participated in aerobic and strengthening exercise, and days awakened feeling rested, per week. Nutrition, exercise and rest were found to explain 4.9% ($p < 0.001$) of the variance of emotional distress in this population.

Students enrolled in five or more years of undergraduate college study were found to have higher reports of emotional distress ($F(4, 67448) = 29.452$, $p = <0.001$) than students enrolled in years one through four. Overall, 14.3% of the students reported depression with the highest percentage occurring among students who were in year five or higher of their study. The primary academic impairment resulted from stress and was most commonly reports of a lower grade on an assignment.

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Chapter 1

Introduction

Emotional distress occurs when stress begins to affect the quality of a person's life (Drapeau, Marchand, & Beaulieu-Pŕevost, 2012). Emotional distress among undergraduate college students is a leading concern of college health providers. When stress becomes distress, students are at risk of decreased academic performance, academic attrition, and depression (Kadison & DiGeronimo, 2004; Melnyk, et al., 2015). Therefore, it is imperative to examine predictors of emotional distress among college students. The American College Health Association (ACHA) (2008) provided data to examine predictors of emotional distress within this population.

Background and Significance

Emotional distress occurs when the stress experienced by undergraduate college students overwhelms their tolerance of it. Feelings of excessive stress, sadness, loneliness, anxiety, and depressive thoughts are expressions of emotional distress (Chow & Flynn, 2016; Hamilton, 2006; Murray 1995). The highest risk of developing emotional distress occurs during times of transition or following traumatic events (Melnyk et al., 2015; Murray, 1995). Undergraduate college students leave the familiarity of their homes, families and secondary schools to attend college concurrently during transition from adolescent into adulthood. As they progress through their programs of study, both positive and negative events

occur increasing their perception of stress. These transitions and events may result in emotional distress.

The negative outcomes of emotional distress include impairment of academic performance and clinical depression. In a large national survey, stress experienced by college students was the top-reported factor affecting academic performance (ACHA, 2014). Depressed students reported lower grades and higher attrition (ACHA, 2016). Enhancing factors that limit the amount of time students experience emotional distress may prevent the negative outcomes of emotional distress among this population.

The ACHA (2012) published *Healthy Campus 2020* to guide educational programs in improving the health of college students. *Healthy Campus 2020* is a companion document to *Healthy People 2020*. *Healthy Campus 2020* includes five overarching goals. These goals are to promote good health, reduce disparities, prevent health concerns, promote positive health behaviors, and support academic success. Objectives addressing reduction of distress and the early recognition and treatment of depression are included in the *Healthy Campus 2020* plan. ACHA researchers propose reducing distress may influence the incidence and prevalence of depression (ACHA, 2012).

Mental Health Concerns on College Campuses

Academic programs and life on college campuses increase the amount of stress experienced by students (Kadison & DiGeronimo, 2004; Melnyk et al.,

2015). When this stress becomes distress, students are at risk of failing to succeed in their coursework and for developing depression. Unfortunately, the studies examining the factors that reduce emotional distress and depression are sporadic and lack an organizing theory.

Depression as a preventable condition and receptive to treatment in primary care is a relatively new idea. Results from previous studies support that nutrition, exercise, and rest elevate mood. Although researchers have studied these concepts, there is a paucity of evidence in the undergraduate college student population. There also are no studies examining the predictive relationship these three positive lifestyle choices have on emotional distress among undergraduate college students. In order to meet effectively, the *Healthy Campus 2020* goals, college health providers need more information as to predictors of emotional distress in this population.

Conceptual Framework

Murray (1995), of the Royal College of Psychiatrists under the direction of the Department of Health, reviewed the theoretical, epidemiological and applied research literature to determine mediating and moderating factors to prevent depression in vulnerable groups. From her review, she identified factors for preventing depression among these groups. Emotional distress was found to be a precursor to depression. She defined emotional distress as stress that affects the quality of a person's life. Anxiety and negative events were the stressors that at

times led to emotional distress. However, depression did not always occur in persons experiencing stress or emotional distress. Although stressors can lead to emotional distress, other factors moderate the amount of emotional distress experienced or mediate whether depression will be the end-result of that distress.

Additionally, she found that life transitions provoked emotional distress, especially in persons predisposed to depression (Murray, 2005). Although Murray's review did not address college students, it did address vulnerable groups. Undergraduate college students have some vulnerability. Transitioning from high school to college and leaving family and social support groups increases their vulnerability (Melnyk et al., 2015). The stressors of academic programs and the progression to adulthood add to the risk of students experiencing emotional distress and depression (Melnyk et al., 2015).

A review of the literature on factors diminishing emotional distress in college-aged students provided details on the positive lifestyle behaviors that may have an effect on this population's development of emotional distress. Nutrition (Alhaj et al., 2012; Feder et al., 2011), exercise (Szuhany, Bugatti, & Otto, 2014; Wipli et al., 2011) and rest (Vargus & Lopez-Duran, 2013) were three factors supported as reducing the perception of emotional distress in college-aged students. The conceptual model depicting the moderator role these three factors have on emotional distress is shown in figure 1.1.

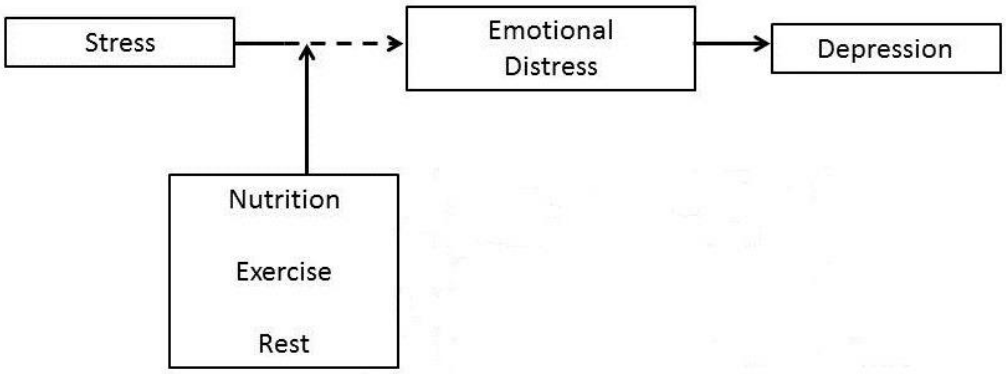

Figure 1-1 Framework Model

For this study, three factors were examined: nutrition, exercise, and rest. The review of literature disclosed how these factors moderate stress from becoming emotional distress. Plant sources of tryptophan and antioxidants elevate serotonin effects thereby elevating mood (Alhaj et al., 2012; Feder et al., 2012). Exercise reduces serotonin receptors on the post-synaptic brain cells preventing reuptake of the serotonin and promotes brain neurotropic factor that increases cell activity promoting mood elevations (Szuhany, Bugatti, & Otto, 2015). Chaotic sleep patterns involve the same chemical pathway as stress reactions; therefore rest reduces the effect of stress on mood (Doane, Gress-Smith, & Breitenstein, 2014; Williams, Cribbet, Rau, Gunn, & Czajkowski, 2013). These findings provided the rationale for including these three factors in the study.

Purpose

One purpose of the study was to examine the predictive relationship of three healthy lifestyle choices with emotional distress of undergraduate college

students. The lifestyle choices of interest in this study were nutrition, exercise, and rest. Another purpose was to describe the prevalence rates of emotional distress and depression by years of study and the rates of students experiencing academic impairment resulting from stress, anxiety or depression. The third purpose was to determine if there was any difference in rates of emotional distress by years of study.

The specific questions of this study were:

1. What is the prevalence within each of the five years of study that undergraduate college students report emotional distress?
2. What is the prevalence within each of the five years of study that undergraduate college students report feeling depressed within the last school year and having ever being diagnosed with depression?
3. Is there a difference by year of study in the prevalence of undergraduate college students reporting emotional distress?
4. What is the prevalence of undergraduate college students reporting impediment of academic performance due to stress or depression/anxiety?
5. Is there a predictive relationship between recommended lifestyle choices and emotional distress among undergraduate college students?

Assumptions

Assumptions of the study were:

1. Emotional distress may increase attrition among undergraduate college students.
2. Emotional distress may develop or increase in the undergraduate college student during transition into the college environment.
3. Transitions in life are stressors capable of causing emotional distress.
4. Undergraduate college students are developmentally mature enough to be self-motivated.
5. The stress experienced by undergraduate college students is sufficient to promote emotional distress.

Chapter Summary

Academic stressors experienced by undergraduate college students can lead to emotional distress. Emotional distress occurs when a person can no longer effectively manage the stressors. It leads to poor academic performance and depression. Murray (1995) provides a model that supports depression is preventable through the moderation of emotional distress. Results from previous studies support that nutrition, exercise, and rest elevate mood. Although these concepts have been studied, there is a paucity of evidence in the undergraduate college student population. There also are no studies examining the predictive

relationship these three positive lifestyle choices have on emotional distress among undergraduate college students. The next chapter reports what is known about each one of the positive lifestyle choices in regards to reducing emotional distress and the gaps in that knowledge.

Chapter 2

Review of Relevant Literature

There exists a small body of literature on the predictive relationship of nutrition, rest, or exercise with mood, anxiety or depressive symptoms. None of the studies specifically measured emotional distress. Most of this research was not conducted specifically in the undergraduate college population either. However, it does support that the variables of consumption of fruits and vegetables, awakening rested, and exercise protect from the development of emotional distress.

The American College Health Association – National College Health Assessment (ACHA-NCHA) survey that provided the data for this study included an emotional distress rating scale. One researcher used the scale to study predictive relationships between lifestyle choices and emotional distress in the undergraduate college population (Hamilton, 2006). This is the only study that used the emotional distress scale. In that study, the researcher examined negative lifestyle choices prediction of emotional distress in undergraduate college students.

There are no studies on the incidence or prevalence of stress or emotional distress during progression through students' programs of study. There are a few studies on mood, anxiety or depression during life transitions (Bernat, Merrill, Braithwaite, Van Orden, & Joiner, 2000; Dyson & Renk, 2006; Leino & Kisch,

2005; Melnyk et al., 2015). Transitioning from high school to college increased risk of anxiety and depression.

Relevant Literature

Emotional Distress within the ACHA-NCHA Data

Hamilton (2006) examined health, lifestyle, and life event predictors of emotional distress in college students. This is the only study to examine predictors of emotional distress using the ACHA-NCHA emotional distress scale. Hamilton (2006) examined predictor variables between two groups with data for one group coming from the ACHA-NCHA national database and the other from data collected using the ACHA-NCHA tool. In both groups, the predictor variables explained 32% of the variance of emotional distress (R^2=0.32, p<0.05). However, the predictor variables were not the same for both groups. In the national sample, there were 17 predictors and in the private sample, there were eight predictors of emotional distress. The lifestyle behaviors found to be predictive in both groups included internet use/games, sleep difficulty, emotional abuse, and relationship difficulty. All of these variables had a positive relationship to emotional distress. She did not examine the predictive relationship of positive lifestyle choices with emotional distress (Hamilton, 2006). This study provided information about predictive factors of emotional distress in the undergraduate college population. These findings prompted the question of whether positive lifestyle choices would protect from emotional distress in this population.

The remainder of the literature reviewed addressed the chosen possible descriptive and predictor variables included in the study. Each variable had minimal, but quality, research support for inclusion in the study.

Nutrition Relationship to Emotional Distress

Fruits and vegetables contain tryptophans and antioxidants theorized to elevate mood. Tryptophans (Schaechter & Wurtman, 1990) and the antioxidants: carotenoids (Milanesci et al., 2012) and ferulic acid (Chen et al., 2014), have been shown to increase tissue serotonin and brain-derived neurotropic factor (BDNF) that produces mood elevations. However, two of these studies were performed on mice.

Schaechter and Wurtman (1990) examined both tryptophan depletion and supplementation and found tryptophan increased tissue serotonin and BDNF. Chen et al. (2014) examined varied doses of ferulic acid given to mice and found elevated serotonin levels in the brain tissue (Chen et al., 2014). In the other study, researchers, however, failed to find mood changes after consumption of these substances (Townsend, Chen, Jeffrey, & Johnson, 2014). Broccoli is a source of both tryptophan and antioxidants. Dietary broccoli was found to decrease slightly neuro-inflammation in aged mice, but did not change social behavior among the mice (Townsend et al., 2014).

The research on human consumption of plant sources of tryptophan and antioxidants is scarce. The population of two of these studies was older persons

and two studies included a population of younger persons, although not specifically college students. The two studies on older persons included repeated measures and the two on younger persons included the variable of a personal or family history of depression.

In a longitudinal study, baseline plasma samples of carotenoids at the third and sixth year were compared to self-reported consumption of fruits and vegetables. The consumption of these nutrients was associated with lower depression symptoms in older persons (n=958; OR= 0.72, p=0.04) (Milanesci et al., 2012).

In another study, older adults ingested twice a day tryptophan-enriched cereals. The researchers found a decreased in state anxiety and depression symptoms (n=35; p<0.05) (Bravo et al., 2013). The effect on state anxiety and depression symptoms occurred one week after ingestion and was demonstrated by comparison to pre-intervention scores. Only the experimental group experienced the decrease in anxiety and depression symptoms. The experimental group also had a significant increase in total antioxidant capacity (p<0.05) (Bravo et al., 2013)

The effect of consumption of tryptophan or antioxidants on emotional distress has not been studied in the college student population. Two groups of researchers, however, studied the effect of tryptophan on mood in young adults. Both groups used a random, double-blind crossover design with two groups.

Neither study included consumption of fruits and vegetables. Both studies included young adults with a strong family history of depression, but no personal history of depression (Alhaj et al., 2012; Feder et al., 2011).

In one study, young adults with and without a family history of depression were stratified into two groups based on family history (Feder et al., 2011). Each group consumed a capsule that lowered tryptophan levels and a placebo. There was no difference in reported mood effects. However, during the time the two groups took the tryptophan-depleting drug, there was a significant difference in an affective go/no-go activity between the group with a strong family history of depression and the group without this risk ($F(1,23)=4.43$, $p=0.047$). The young adults with a stronger family history of depression primarily were more likely to experience a higher number of inappropriate responses to sad images than they did to happy images ($t(12)=1.93$, $p=0.08$) (Feder et al., 2011).

In the second study, each participant ($n=18$) lacked a personal history of depression, but had a strong family history of it (Alhaj et al., 2012). Each group received a drink with 1.15 g of tryptophan and one without. There was no significant difference in mood change, although there were significant differences in the plasma levels of free tryptophan after consuming the tryptophan drink (Alhaj et al., 2012)

Although support for the hypothesis that the consumption of fruits and vegetables will lower emotional distress is scarce, there is evidence that the

substances within these plant sources that may have this effect are tryptophans and antioxidants. Given the current dietary recommendations to consume more fruits and vegetables for overall well-being and the findings that these substances can reduce neuro-inflammation, increase tissue levels of serotonin, and increase BDNF, it was feasible to include this variable in the study.

Exercise Relationship to Emotional Distress

Researchers identified that exercise reduces serotonin receptors on the post-synaptic brain cell, preventing reuptake of the serotonin (Wipfli, Landers, Nagoshi, & Ringenbach, 2011) and promoted brain neurotropic factor that increased the cell activity, thus promoting mood elevations (Szuhany, Bugatti, & Otto, 2015). These findings provide the theoretical basis for including regular exercise as a moderator of emotional distress. Wipfli et al. (2011) performed a study on young adults (18-30 years of age) examining the relationship exercise had with anxiety and depression. The methodology was a random-control trial of 65 volunteers, with the control group stretching and the treatment group cycling. There were no differences between pre-tests scores of anxiety or depression between the two groups, but the cycling group had lower depression scores post-intervention ($F(1,63) = 4.22$, $p<0.05$). However, they did not experience a significant reduction in anxiety. The serum serotonin levels significantly decreased in the cycling group as compared to the control group ($F(1,58) = 5.57$, $p<0.05$) (Wipfli et al., 2011). This provides support that exercise has a similar

effect as selective serotonin reuptake inhibitors (SSRIs) used to treat anxiety and depression.

Wipfli et al. (2011) theorized that brain-derived neurotropic factor (BDNF) would mediate the effect exercise has on mood. Previous studies had confirmed that BDNF promotes mood elevations in rats. However, Hopkins, Davis, Vantieghem, Whalen, and Bucci, (2012) attempted to show that persons with BDNF allelic status who exercised had higher mood elevations than those that do not have BDNF allelic status. They found that persons who had the BDNF gene and exercised regularly over four weeks had lower perceived stress, but the difference was not statistically significantly. They proposed future research comparing persons with and without the gene who exercise over longer periods of time (Hopkins et al., 2012).

Research conducted on whether regular exercise raised the BDNF levels does exist. Szuhany, Bugatti, and Otto (2015) performed a meta-analytic review of the effects exercise had on BDNF. Eight studies were examined to determine the effect regular exercise had on BDNF levels and 13 studies were examined to determine the effect regular exercise had on resting BDNF levels. The findings of both analyzes were statistically significant (Hedges' g = 0.59, z=2.35, p=0.02; Hedges' g = 0.27, z=2.81, p=0.005) (Szuhany et al., 2015). These results support the hypothesis that regular exercise boosts BDNF levels and that the elevated

levels were sustained over time. Other studies examined whether exercise affected emotional distress.

There are numerous studies examining the effect exercise had on reducing emotional distress, however few were conducted on college students and only the Szuhany et al.(2015) meta-analysis and one other study (Wipli et al., 2011) examined regular exercise's effect had on any form of psychological functioning among college-aged participants. These studies support that regular exercise can reduce serum serotonin and can increase the mood elevating BDNF levels in young adults. A gap existed as to whether the exercise students reported were predictive of emotional distress.

Rest Relationship with Emotional Distress

Chaotic sleep patterns involve the same chemical pathway as stress reactions (Vargus & Lopez-Duran, 2013). Stress increases salivary levels of cortisol, known as the stress hormone. Cortisol rises at the moment of awakening known as the cortisol awakening response. The relationship between sleep time, cortisol awakening response, and perceived stress was studied among college students (Vargus & Lopez-Duran, 2013). The findings indicate that total sleep time was the strongest predictor of cortisol levels (n=58; t=4.84, p<0.001) with anticipatory stress not related to awakening cortisol levels (Vargus & Lopez-Duran, 2013). This indicates that sleep quantity may affect the stress response in college-aged persons.

Two research teams have provided evidence that sleep loss or disturbance affects mood. Paterson et al. (2010) studied the effect sleep loss had on young adults to understand the structural aspects of mood. In a laboratory study, they found two nights of disturbed sleep resulted in less positive moods, but not necessarily higher depression (n=43, t=5.7, p<0.001). A three-point scale measured the changes in mood and the researchers felt the scale lacked sensitivity in determining depression (Paterson et al., 2010). Kahn, Fridenson, Lerer, Bar-Haim, and Sadeh (2014) performed a pilot study of 61 young adults examining the effect of one night's sleep disturbance on mood. This study was performed on Hebrew speaking participants using a scale translated from English to Hebrew (Kahn et al., 2014). They used a five-point mood scale and discovered one night of having sleep disrupted over an eight hour period resulted in higher perceived depression and dejection (F(1,57)=14.88, p<0.0005).

In similar fashion, Williams, Cribbet, Rau, Gunn, and Czajkowski (2013) studied the affect sleep disturbances had on distress. They created sleep disturbances within a lab on 98 college students and measured the relationship the prior month's perception of sleep quality had with current perceived stress. They found a weak, significant correlation of 0.30 (p<0.05); however, this does suggest that chaotic sleep patterns specifically within the college student population results in worsening moods. The following year another group of researchers examined the predictive relationship between rest and anxiety in students as they

transitioned from high school to college (Doane, Gress-Smith, & Breitenstein, 2014).

Doane et al. (2014) studied the relationship between sleep problems and anxiety in high school students as they transitioned through their first year of college. These researchers found that subjective sleep problems predicted anxiety (n=82; β=0.29, p=0.001) during transition into the first semester. After that point, it appears anxiety predicted sleep problems (Doane et al., 2014).

Despite these researchers not examining the same aspects of emotional distress, they did provide evidence for the relationship between rest and emotional distress in young adults and college students. The findings provide support for including the variable in the model.

Strength and weaknesses of literature on predictive variables.

One of the challenges of synthesizing these findings was that the researchers did not define the variables in the same way. Emotional distress was the construct each team examined but operationalized with measurements of anxiety, mood, depression, and stress. Another limitation of the available evidence was that there was only one study that examined emotional distress in college students in the manner the ACHA-NCHA survey measured emotional distress. Additionally, some of the studies used mice as an animal model and had populations other than college students.

Strengths of the review of literature were that the studies provided adequate evidence to warrant including the selected variables in the model. The findings of these studies explained how the consumption of fruits and vegetables, rest and exercise were related to emotional distress. These explanations were included in the conceptual model that framed the study.

Anxiety, Depression and Emotional Distress

The incidence and prevalence of emotional distress as a condition is not reported. Instead, there are reports of anxiety and depression. Since the induction of the ACHA National College Health Assessment (ACHA-NCHA) in 2000, the ACHA-NCHA data has become the benchmark for rates of anxiety and depression among college students. ACHA began reporting the rates of anxiety and depression among undergraduate college students in the fall semester of 2011. Before that semester, the reports included graduate students. Since that time, undergraduate student reports of having a clinical diagnosis of anxiety have increased from 11.8% in fall 2011 to 17% in spring 2016, with a pattern of steady increases beginning in spring 2013 (ACHA, 2011; ACHA, 2013b; ACHA, 2016). Clinical depression reports from the same time show a fluctuating rate ranging from 10.4% to 14%, with the highest rates in spring 2016 of 14% and fall 2013 of 13.2% (ACHA, 2013a; ACHA, 2016).

Emotional Distress and Academic Performance

Emotional distress and depression lead to attrition. Students reported that stress (33%), anxiety (24.4%), and depression (16.2%) lowered their academic performance (ACHA, 2016). Stress was the top reported factor and depression was the fourth reported factor affecting academic performance (ACHA, 2016). NAMI (2012) reported 64% of students stated they were no longer attending collage due to a mental health reason with students reporting anxiety (11%) and depression (27%) as the primary reason they left.

In a study over 10 years ago, 15 predictors of academic performance produced a multiple linear regression model explaining 21.8% of the variance (Larson, Orr, & Warne, 2016). Of the 15 predictors, nine were stressors, including diagnosis with a mental illness, ability to handle stress, and level of stress (Larson et al., 2016).

Only one study examined the effect mood has on academic performance. Chronically happy students had higher grade point averages; however, only if they occasionally experienced unhappiness (*simple effect* = 0.105, *SE* = 0.047, *p* = 0.025; at least 1.25 additional days of negative affect in a 2-week period) (Barker, Howard, Galambos, & Wrosch, 2016). These researchers also found that GPA was lower during the first year of study, but rebound by completion of the second year (Barker et al., 2016).

Previous researchers measured mental health concerns and emotional distress in a variety of ways, which limits the ability to compare the results. The findings do support that emotional and affective disorders can be a factor in impairing academic performance.

Life Transitions and Emotional Distress

Theoretically, college students are at a higher risk of developing emotional distress during times of transition into the program of study and while progressing through the program of study (Melnyk et al., 2015; Murray, 1995). There are no studies focusing on life's transitions and emotional distress in college students. There are a few studies examining life transitions and mood, affective disorders or depression in college students. .

Four groups of researchers discovered that certain family characteristics and negative life events were related to the development of emotional distress or depression. A lack of family understanding of the culture of college was related to a higher incidence of PTSD symptoms ($F(1,1642)=5.05$, $p=0.02$), but not depression symptoms ($F(1,1642)=3.12$, $p=0.08$) (Jenkins, Belanger, Connally, Boals, & Durón, 2013). Family life and stress in college predicted depressive symptomatology in college freshmen ($F(5,68) = 4.73$, $p < 0.0009$) (Dyson & Renk, 2006). Bernat, Merrill, Braithwaite, Van Orden, and Joiner (2000) also found that family life and stress in college predicted depression ($\beta = 0.14$, $t(110) = 1.96$, $p = 0.05$). The development of depression after enrollment was associated

with negative life events such as substance use and being in an abusive relationship ($p < 0.001$) (Leino & Kisch, 2005).

These studies support that life transitions affect mood and depression. Although it is known that life transitions have an effect on the emotional well-being of this population, it is not known if that effect is more likely to occur during the first year or continue throughout the programs of study.

Chapter Summary

Consumption of plant tryptophans and antioxidants and exercise increases tissue levels of serotonin and BDNF all of which elevates mood. Rest lowers the stress response. This explains how nutrition, exercise and rest moderate emotional distress.

A gap in knowledge existed about whether there is a predictive relationship of these variables on emotional distress in undergraduate college students. Published studies that examined the predictive relationship of all three of the variables with perceived emotional distress among this population were not found.

Life transitions increase college students' susceptibility to mood disorders. It is unknown if that effect primarily occurs during the first year or continues throughout the programs of study.

Chapter 3

Methods and Procedure

The purpose of the study was to examine the predictive relationship of three healthy lifestyle choices with emotional distress of undergraduate college students. Another purpose was to describe the prevalence of emotional distress, stress, anxiety, and depression among these students. A descriptive correlational design using secondary data obtained from the American College Health Association (ACHA) was used for the study. This chapter addresses methods and procedures used in performing the study.

Research Design

A descriptive correlational design was used to conduct a secondary data analysis from data obtained from ACHA. The data set chosen for this study was the American College Health Association-National College Health Assessment II (ACHA-NCHA) collected for spring 2008.

The specific questions of this study were:

1. What is the prevalence within each of the five years of study that undergraduate college students report emotional distress?
2. What is the prevalence within each of the five years of study that undergraduate college students report feeling depressed within the last school year and having ever being diagnosed with depression?

3. Is there a difference by year of study in the prevalence of undergraduate college students reporting emotional distress?
4. What is the prevalence of undergraduate college students reporting impediment of academic performance due to stress or depression/anxiety?
5. Is there a predictive relationship between recommended lifestyle choices and emotional distress among undergraduate college students?

The rationale for using a descriptive correlational design was to determine the predictive relationship the lifestyle choices of consuming fruits and vegetables, obtaining restful sleep, and completing regular exercise had with the amount of emotional distress experienced by these students.

Emotional distress is theorized to occur due to negative events that occur through transitions in a person's life (Melnyk et al., 2015; Murray, 1995). This is the rationale for describing the prevalence of emotional distress, anxiety, stress, and depression by year of school and examining if there is any difference between the prevalence of emotional distress by year of school.

The ACHA collects data each semester from colleges across the United States and Canada to assist college health providers and researchers to improve the health of college students. The advantages of using a nationally collected data set are the extensiveness of the data set and reduced time and cost to collect the

data (Polit & Beck, 2012). In addition, secondary analysis may assist the researcher in clarifying the research question and generating new insights about the population (Polit & Beck, 2012). The ACHA-NCHA data sets often are used to provide descriptive insights about the population. The data sets have been used less often to report predictive relationships among the variables. The size and breadth of the sample collected was an advantage of using this data set. The disadvantages of using a nationally collected data set were no control over the quality of the data, decreased familiarity with the data; time lag between data collected and analyzed, and decreased specificity to the researcher's needs (Polit & Beck, 2012).

Sample

The participants of this data set were undergraduate college students across the United States and Canada. The ACHA required students to be at least 18 years of age to complete the survey (ACHA, 2009). The survey was developed only in English; therefore, all participants spoke and read this language. The ACHA-NCHA data set included both undergraduate and graduate students. However, the data from the graduate students were deleted from the data set for this study. Undergraduate student was defined as a student who self-identifies as a college student in the first year, second year, third year, fourth year, or fifth year or more of study. The data set includes 68,588 undergraduate student responses. Colleges and universities self-selected to participate in the data collection process.

College students randomly chosen from the participating colleges and universities completed the survey developed by the ACHA. Random selection of classrooms also was used as a sampling method. The data collected were de-identified and were shared with the researcher upon approval of the ACHA.

The data set was large; therefore, the probability level was set at 0.01 with a power level of 0.95. No studies had been published examining the variables of this study; therefore, effect sizes had not been reported. Hamilton (2006) performed a study examining the predictive relationship of some of the negative lifestyle variables and emotional distress within an ACHA-NCHA data set. However, Hamilton (2006) did not report the effect sizes in the study; therefore, a small effect size of 0.02 was used in the a priori sample size estimation for this study.

The researcher used the explanation provided by Faul, Erdfelder, Buchner, and Lang (2009) to conduct the power analysis using the G*Power 3.1.9.2 program for the predictive analysis for research question 5. There were three predictor variables. Fruits and vegetables consumption and awakened feeling rested were measured at the discrete level. Exercise frequency was measured at the continuous level. Awakened feeling rested and the number of servings of fruits and vegetables consumed each day were measured at the ordinal level. A sample size of 1140 observations were required to detect an effect of f^2=0.02 at

alpha=0.01, beta=0.05, with three predictors. The data were collected from 68,588 undergraduate college students.

Setting

The data were collected by the ACHA in the spring semester of 2008 from students on 106 college and university campuses. Participating institutions represented schools from across the United States and four schools located in Canada. More public institutions participated than private ones. Institutions in the South and West participated slightly more than institutions in the North and West (Table 3-1). Campuses with at least 10,000 students had greater participation than campuses of smaller sizes. Campuses from very large cities, small cities and large towns participated more than campuses from small towns or large cities. Most of the campuses that participated were master's-level colleges, universities, and research institutions within the Carnegie classification system. Table 3-1 includes additional details about the demographic characteristics of the settings.

Table 3-1 Demographic Characteristics of the 106 US Postsecondary Institutions Included in the Spring 2008 ACHA-NCHA Undergraduate Reference Group

	Campus Characteristic	*n*
Type of institution	Public	65
	Private	41
	2-year	5
	4-year or above	101
Location of campus	Northeast (CT, ME, MA,NH,NJ,NY,PA,RI, VT)	17

Table 3-1 *continued*

	Midwest (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI)	18
	South (AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV)	35
	West (AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY)	32
	Canada	4
Campus size	<2,500 students	16
	2,500-4,999 students	12
	5,000-9,999 students	18
	10,000-19,000 students	35
	20,000 students or more	25
Campus setting	Very large city (population greater than 500,000)	27
	Large city (population 250,000-499,999)	8
	Small city (population 50,000-249,999)	36
	Large town (population 10,000-49,999)	27
	Small town (population 2,500-9,999)	4
	Rural community (population less than 2,500)	4
Carnegie classification	Associates college	3
	Baccalaureate colleges	17
	Master colleges and universities	31
	Research institutions	49
	Special focus institutions	2
	Miscellaneous not classified (located outside the United States)	4

(ACHA, 2009)

Measurement Methods

The ACHA-NCHA spring 2008 database consists of data collected from over 68,000 undergraduate students (ACHA, 2009). The tool contains over 300 questions. The ACHA reports the data in data sets by semester and year (ACHA,

2006.) Table 3-2 displays the conceptual and operational definitions of each variable analyzed in this study.

Table 3-2 Conceptual and Operational Definitions of the Study Variables

Variable	Conceptual Definition	(Item number) Operational Definition
Emotional distress	Stress that overwhelms personal tolerance (Murray, 1995)	(40a-e) Sum of 5 items on a seven-point scale (1 to 7) with a range of 5 to 35. Each item asks about the experience of emotional distress.
Fruits/vegetables	Dietary consumption of fruits and vegetables	(38) Number of servings per day measured with four categories (0, 1-2, 3-4, 5 or more)
Morning restfulness	Adequate sleep to feel restful in the morning.	(39c) Number of days in the past week obtained sufficient sleep to feel rested in the morning.
Exercise	Aerobic and strength-building activities	(39a&b) Sum of 2 items on an eight-point scale (0-7) with a range of 2 to 16. Each item asks about exercise. One asks about intensity of aerobic and one asks about strength training.
Year in school	Year enrolled in the student's pursuit of an undergraduate degree	(49) 1st to 5th year or more of enrollment.
Feeling depressed	Perceptions of being depressed	(43g) Perception of whether experienced depression within the last year.
Impediments to academic performance	Emotional disorders that effect academic retention	(44l&aa) Emotional state of depression/anxiety disorder (l) and stress (aa) lowering academic performance Each question asks if the condition led to a course incomplete or dropped course.
Depression diagnosis	Clinical diagnosis of depression	(4a) Report of having received a diagnosis of depression.

The ACHA developed the NCHA in 1998 and revised it in 2000 and 2008. Revisions in to the tool included items derived from the National College Health Risk Behavior Survey (NCHRBS), Student Health Survey, the Core Survey, the College Health Alcohol Study, Annual Student Health Behavior Assessment, Monitoring the Future study, and the National Health Outcomes as included in *Healthy People 2000* (ACHA, 2004). An interdisciplinary team of college health professionals developed the tool, but the number of panelists and the credentials of these professionals were not identified (ACHA, n.d). Pilot testing of the tool occurred in 1998-1999 and in 2000, including reliability and validity analyses of the tool (ACHA, n.d.). This analysis included 28 U.S. post-secondary institutions who randomly selected students to participate in the survey (ACHA, n.d.). The association completed reliability and validity analyses from this data collection and in comparison to data from other national data sets (ACHA, n.d.).

The measure of emotional distress was the Emotional Distress Scale within the ACHA-NCHA. Hamilton (2006) developed the scale from the ACHA-NCHA survey tool. It consisted of five items with a reliability of 0.86 and 0.88 in two samples (Hamilton, 2006). In the current study, the reliability was 0.88. Confirmatory factor analyses in two samples showed factor loadings of the items ranging from 0.73 to 0.86 (Hamilton, 2006). This scale included seven Likert-type choices summed with higher scores indicating higher levels of emotional distress.

The possible scores range from 5 to 35. The ACHA-NCHA spring 2008 data set was the final data set to include this scale.

The predictor variable of exercise consisted of the sum of two items on the ACHA-NCHA to provide an estimate of the amount of exercise the student completed each week. One of the two items examined the number of days participating in aerobic activities and the other examined the number of days participating in muscle toning or strengthening activities. The theoretical framework for the study proposes that exercise in any form completed regularly improves mood. Combining the two forms of exercise was believed to enhance the ability of exercise to improve mood.

Procedure

The institutions who chose to participate in the survey (ACHA, n.d.) randomly selected students individually to participate or they selected students from classrooms that were randomly selected (ACHA, n.d.). The survey was administered in paper form and via the web. Of the 106 participating institutions, 96 administered a paper survey and 10 administered a web-based survey (ACHA, 2009). ACHA researchers provided information regarding mean response proportions for the entire sample, which included graduate responses as well as undergraduate responses. Table 3-3 lists the number of students that participated and the mean response proportions.

Table 3-3 Mean Response Proportion from Spring 2008 Administration of the ACHA-NCHA

Students	All Institutions	Paper Survey Administration	Web Survey Administration
Number of institutions	106	96	10
Number of students*	80,121	72,893	7,228
Mean response proportions*	29%	91%	9%

*Not limited to undergraduate responses.

(ACHA, 2009)

The ACHA-NCHA data set was chosen based on its suitability to the research question of the relationship of nutrition, rest and exercise to emotional distress in undergraduate college students. The ACHA-NCHA data sets provide the most comprehensive information regarding the health of college students (ACHA, n.d.). The procedure for using the data is displayed in Figure 3-1.

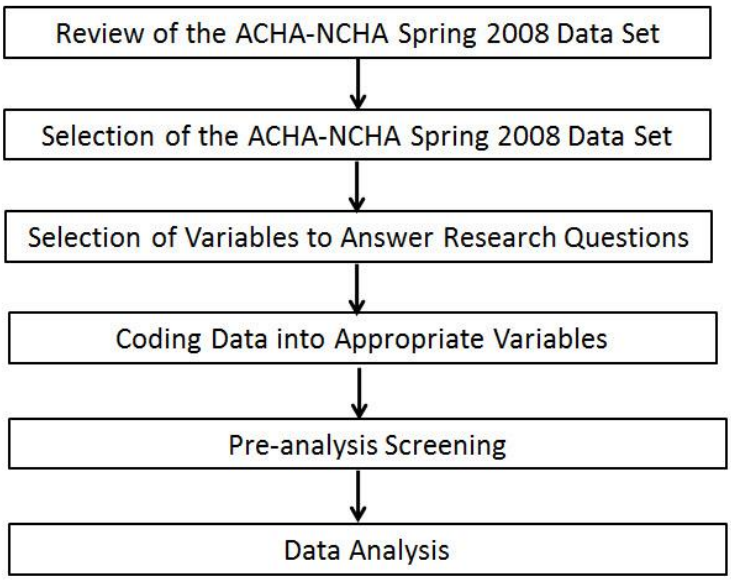

Figure 3-1 Flowchart of Data Selection and Preparation

The study variables were coded as indicated in Table 3-4. The variable of interest, emotional distress, was coded as indicated by Hamilton (2006), the researcher who performed the initial validity and reliability analysis on the scale. Exercise was coded as the sum of two variables. The other variables were coded by ACHA-NCHA coders.

Table 3-4 Coding of Each of the Study Variables

(Item #) Variable [Research Question]	Codes	Level of Measurement
(40) Emotional distress [1, 3, & 5]	(a) Felt things were hopeless (b) Felt overwhelmed by all had to do (c) Felt exhausted (not from physical activity) (d) Felt very sad (e) Felt so depressed that it was difficult to function Never – 1 1-2 times – 2 3-4 times – 3 5-6 times – 4 7-8 times – 5 9-10 times – 6 11 or more times – 7	5 items summed ordinal with possible score 5-35
(38) Fruits/vegetables [5]	0 servings per day – 1 1-2 servings per day – 2 3-4 servings per day – 3 5 or more servings per day – 4	Ordinal
(39c) Morning restfulness [5]	0 days – 1 1 day – 2 2 days – 3 3 days – 4 4 days – 5 5 days – 6 6 days – 7 7 days – 8	Ordinal
(39a&b) Exercise [5]	0 days – 1 1 day – 2 2 days – 3 3 days – 4 4 days – 5 5 days – 6 6 days – 7 7 days – 8	2 items summed ordinal with possible score 2 to 16

Table 3-4 *continued*

(49) Year in school [1 & 2]	1st year undergraduate – 1 2nd year undergraduate – 2 3rd year undergraduate – 3 4th year undergraduate – 4 5th year or more undergraduate – 5	Ordinal
(43g) Feeling depressed within the last year [2]	Yes or No	Nominal
(44l&aa) Impediments to academic performance [4]	2 items (depression/anxiety disorder) (stress) This did not happen /not applicable – 1 Experienced but did not affect academic performance – 2 Received a lower grade on an exam or important project – 3 Received a lower grade in the course – 4 Received an incomplete or dropped a course – 5	Ordinal
(41a) Diagnosed with depression [2]	1 item (Ever diagnosed with depression) Yes or No	Nominal

Ethical Considerations

Permission to use the data was obtained from the ACHA on September 29, 2009 (Appendix A). Written permission to conduct the study was obtained from the University of Texas at Arlington Institutional Review Board (IRB). The IRB approved this study as exempt from coverage under the federal guidelines for protection of human subjects as all data were reported to ACHA without identifiers (ACHA, n.d.) (Appendix B). The participating institutions obtained

informed consent in accordance to their institutions' review board protocols (ACHA, 2004).

The database was sent by ACHA without any student or university identifiers. The database was stored on the CD sent by ACHA in a locked cabinet in the researcher's locked office. The database was downloaded into the statistical software program, *Statistical Package for Social Sciences (SPSS) version 22*, and stored on the researcher's password protected computer in her locked office. Only the researcher had access to these files.

Data Analyses

Data were screened prior to analysis. There were less than 5% missing data in each of the study variables. Due to the low percentage of missing data, the missing data were removed from the predictive analysis using the listwise default (Mertler & Vanlatta, 2001). Frequency and exploratory distributions were performed to ensure values recorded were within the possible options presented by the tool.

Demographic Variables

Tables 3-5 list the demographic variables reported in this study. Each of these variables was chosen to provide information regarding the demographic composition of undergraduate college students, the students' perceptions of their own health, and their perceptions of impediments to academic success.

Table 3-5 Demographic Variables from the ACHA-NCHA Spring 2008 Dataset

(Item #) Demographic Variable	Codes	Level of Measurement	Data Analysis
(45) Age	18 or older	Interval	Frequency distribution, mean and standard deviation
(46) Gender	Female – 1 Male – 2	Nominal	Frequency and percentages
(51a-f) Self-description	7 items (Yes=1, no=2) White Black or African-American Hispanic or Latino/a Asian or Pacific Islander American Indian, Alaskan Native, or Native Hawaiian Other	Nominal	Frequency and percentages
(52) International student	Yes – 1 No – 2	Nominal	Frequency and percentages
(53) Relationship status	Single – 1 Married/partnered – 2 Separated – 4 Divorced – 5 Widowed - 6 Engaged/committed – 3	Nominal	Frequency and percentages
(54) Home	Campus residence hall – 1 Fraternity or sorority house - 2 Other college housing - 3 Parent/guardian's home - 5 Other off-campus housing - 4 Other – 6	Nominal	Frequency and percentages

Table 3-5 *continued*

(1) General health perception	Excellent – 1 Very good – 2 Good – 3 Fair – 4 Poor – 5 Don't know – 6	Ordinal	Frequency, percentages
(58) Health insurance	Yes – 1 No - 2 Not sure – 3	Nominal	Frequency, percentages
(50) Enrollment status full-time	Yes – 1 No – 2	Nominal	Frequency and percentages
(55) Social fraternity/sorority	Yes – 1 No – 2	Nominal	Frequency and percentages
(56) Hours/week work	0 hours – 1 1-9 hours - 2 10-19 hours - 3 20-29 hours - 4 30-39 hours - 5 40 hours - 6 More than 40 hours – 7	Ordinal	Frequency, percentages
(57) Hours/week volunteer	0 hours – 1 1-9 hours - 2 10-19 hours - 3 20-29 hours - 4 30-39 hours - 5 40 hours - 6 More than 40 hours – 7	Ordinal	Frequency, percentages

Research Question 1

What is the prevalence within each of the five years of study that undergraduate college students report emotional distress?

The prevalence within each of the five years of undergraduate study that college students report emotional distress was analyzed using descriptive statistics. Means and standard deviations were reported for each year. Emotional

distress was measured as a continuous variable with a possible score of 5 to 35. The years of study were measured on a five-point nominal scale

Research Question 2

What is the prevalence within each of the five years of study that undergraduate college students report feeling depressed within the last school year and having a diagnosis of depression?

The prevalence within each of the five years of study that students report feeling depressed within the last year and having a diagnosis of depression was analyzed using descriptive statistics. The percent of students indicating a feeling of depression and having a diagnosis of depression were reported.

Research Question 3

Is there a difference by year of study in the prevalence of undergraduate college students reporting emotional distress?

The exploration of whether there was a difference by year of study in the expression of emotional distress was analyzed using an analysis of variance (ANOVA). Emotional distress was measured as a continuous variable and years of study as an ordinal variable. The alpha level was set at 0.01. The Scheffé post-hoc test was used to determine which groups were different.

The assumptions for ANOVA are met if the variable of interest, emotional distress, comprises of continuous data and the variable is collected among three or more independent groups (Mertler & Vannatta, 2001). The variable of interest

should be normally distributed with equal variances (Mertler & Vannatta, 2001). The testing of these assumptions is addressed in chapter four.

Research Question 4

What is the prevalence of undergraduate college students reporting impediment of academic performance due to stress or depression/anxiety?

The prevalence of students reporting stress or depression/anxiety impeding academic performance was analyzed using descriptive statistics. The results were reported as percentages.

Research Question 5

Is there a predictive relationship between recommended lifestyle choices and emotional distress among undergraduate college students?

Exploratory analysis was performed to examine measures of central tendency of the study variables. The means and standard deviations of emotional distress and amount of exercise were reported. Additionally, the frequency, percentages and medians of the consumption of fruits and vegetables and feeling rested were reported.

Multiple linear regression with three predictor variables and one variable of interest was performed to determine the predictive relationship nutrition, exercise and rest had with emotional distress. Due to the large number of participants, the alpha was set at 0.01.

The assumptions for multiple linear regression include research design issues, linearity, homoscedasticity, and normality (Mertler & Vannetta, 2001). The assumptions associated with the research design include fixed predictor variables, absence of measurement error, and means of zero over time on residual variables (Mertler & Vannetta, 2001). The assumptions that address linearity include linear relationship between predictor variables and the variable of interest, absence of multicollinearity, and non-correlation between the errors and the predictor variables (Mertler & Vannetta, 2001). The assumption of homoscedasticity is met if equal variances of the residuals across all predictor variables exists (Mertler & Vannetta, 2001). The assumption of normality is met if the errors are normally distributed (Mertler & Vannetta, 2001).

The method used to test the assumptions regarding the research design was to ensure the recorded values were as error-free as possible, through pre-analysis data screening procedures such as examining for missing data, univariate outliers, univariate normality, multivariate outliers, multivariate linearity and normality, and multivariate homogeneity of variance (Mertler & Vannetta, 2001). Linearity and normality were assessed through examination of various bivariate and residual scatter plots. Normality also was assessed by examining for skewness, kurtosis, and Kolmogorov-Smirnov statistics (Mertler & Vannetta, 2001). An interpretation of residuals plot was used to assess homoscedasticity (Mertler & Vannetta, 2001).

Delimitations

This study concerns undergraduate college students; therefore, the data analyzed includes only students classified as undergraduates. The sample was comprised of English speaking students who were at least 18 years of age and attended colleges and universities who chose to participate in the survey. The ACHA required students to be at least 18 years of age to complete the survey (ACHA, 2009). The survey was developed only in English; therefore, all participants spoke and read this language.

Chapter Summary

The research design chosen for the study was descriptive correlational because the purpose of the study was two-fold. One purpose was to examine the predictive relationship of three healthy lifestyle choices with emotional distress of undergraduate college students. A multiple linear regression analysis of secondary data provided by the spring 2008 data set of the ACHA-NCHA survey was conducted to address the first study purpose. Descriptive analysis was performed to analyze the second study purpose of describing prevalence of emotional distress and depression by year in school.

The data were reported without individual identification. The university's IRB deemed the data exempt from human subjects protection. Pre-analysis data screening was completed to ensure the data were accurate and met the assumptions of multiple linear regression analysis.

Chapter 4

Findings

The results of a secondary analysis from the ACHA-NCHA Spring 2008 database are presented in this chapter. The results provide information regarding the predictive relationship of consuming fruits and vegetables, exercising, and awakening feeling rested with emotional distress in undergraduate college students. Information also was gained about the prevalence of emotional distress and depression within each year in program and whether the students' perceived depression caused them to not complete a course or program. The chapter begins with a description of the sample and progresses to address each of the study questions.

Study Results

Sample Description

The sample included undergraduate students in their first year to fifth year or more of study at a college or university. Twenty-nine cases were deleted from the database based on multivariate outlier Mahalanobis distance analysis (Mertler & Vannatta, 2001). These cases were determined to be extreme and could have had too large an impact on the regression solution (Tabachnick & Fidell, 1996). This left a sample size of 68,559. None of the study variables had a percentage of missing data over 5%, therefore missing data were listwise deleted from the

predictive analysis (Mertler & Vannatta, 2001). The data were considered missing at random and the sample size was large enough that statistical power was not negatively affected (Mertler & Vannatta). The mean age of the students was 21.04 years (*SD*=4.26) with a range of 18 to 90 years. The variable of age had less than 1% of data missing. Further descriptions of the sample are presented in table 4-1, 4-2, 4-3, and 4-4.

Table 4-1 Description of the Sample Demographic Variables from the ACHA-NCHA 2008 Database (n=68,559)

Variable	Frequency	Percent
Gender		
Males	23,517	34.3
Females	44,403	64.8
Missing	639	0.9
Self-description		
White	50,234	73.3
Black	3,044	4.4
Hispanic	4,036	5.9
Asian	7,194	10.5
Indian	966	1.4
Other	2,607	3.8
Missing	478	0.7
International student		
Yes	2219	3.2
No	65,765	95.9
Missing	575	0.8
Home		
Residence hall	29,302	42.7
Fraternity/sorority house	1,628	2.4
Other university housing	3,985	5.8
Off campus	23,539	34.3

Table 4-1 *continued*

With parents	7,632	11.1
Other	2,202	3.2
Missing	271	0.4
Relationship status		
Single	39,551	57.7
Married	3,196	4.7
Engaged	25,009	36.5
Separated	164	0.2
Divorced	345	0.5
Widowed	38	0.1
Missing	356	0.4

Table 4-2 Description of the Sample School Variables from the ACHA-NCHA 2008 Database (n=68,559)

Variable	Frequency	Percent
Year in school		
1st year	18,177	26.5
2nd year	16,120	23.5
3rd year	16,722	24.4
4th year	13,666	19.9
5th year or more	3874	5.7
Enrollment status		
Full-time	65,813	96.0
Part-time	2,133	3.1
Missing	613	0.9
Fraternity/sorority		
Yes	7,612	11.1
No	60,354	88.0
Missing	593	0.9

Table 4-3 Description of the Sample Work Variables from the ACHA-NCHA 2008 Database (n=68,559)

Variable	Frequency	Percent
Hours week/work		
0 hours	28,486	41.5
1-9 hours	13,604	19.8
10-19 hours	13,860	20.2
20-29 hours	7,503	10.9
30-39 hours	2,546	3.7
40 hours	1,288	1.9
>40 hours	905	1.3
Missing	1,272	1.8
Hours week/volunteer		
0 hours	41,199	60.1
1-9 hours	24,153	35.2
10-19 hours	1,897	2.8
20-29 hours	417	0.1
30-39 hours	101	0.0
40 hours	56	0.0
>40 hours	79	0.0
Missing	657	0.1

Table 4-4 Description of the Sample Health Variables from the ACHA-NCHA 2008 Database (n=68,559)

Variable	Frequency	Percent
General health		
Excellent	11,432	16.7
Very good	30,967	45.2
Good	20,412	29.8
Fair	4,728	6.9
Poor	698	1.0
Don't know	125	0.2
Missing	202	0.3

Table 4-4 *continued*

Health insurance		
Yes	56,593	82.5
No	4,816	7.0
Don't know	3,245	4.7
Missing	3,905	5.7

Study Variables Descriptive Statistics

The measures of central tendency of the continuous variables are presented in Table 4-5. The frequency distributions of the categorical variables are presented in Table 4-6.

Table 4-5 Measures of Central Tendency of Continuous Study Variables

Variable	N	Mean	Standard deviation	Minimum value	Maximum value
Emotional distress	67,453	16.6	7.9	5	35
Exercise	67,826	6.3	1.9	2	16

Table 4-6 Frequency Distributions of Ordinal Study Variables (n=68,559)

Variable	Frequency	Percent
Fruits/vegetables		
Don’t eat	2100	3.1
1-2 servings	38,352	55.9
3-4 servings	22,173	32.3
5 or more servings	5413	7.9
Missing	521	0.8
Awakened feeling rested last week		
0 days	6257	9.1
1 day	7113	10.4
2 days	11,272	16.4
3 days	12,155	17.7
4 days	11,483	16.7

Table 4-6 *continued*

5 days	10,463	15.3
6 days	5,104	7.4
7 days	4,270	6.2
Missing	442	0.6

The means and standard deviations of the individual items on the emotional distress scale are presented in Table 4-7.

Table 4-7 Means and Standard Deviations of Individual Items on the Emotional Distress Scale

Item	*N*	Minimum	Maximum	Mean	SD
Hopelessness last school year	68,211	1	7	2.61	1.899
Overwhelmed last school year	68,220	1	7	4.48	2.006
Exhausted last school year	68,185	1	7	4.36	2.058
Very sad last school year	68,099	1	7	3.14	1.974
Depressed last school year	68,141	1	7	2.09	1.747

Research Questions

Research question 1.

What is the prevalence within each of the five years of study that undergraduate college students report emotional distress?

The prevalence of students reporting emotional distress (n = 67,453) is depicted in figure 4-1. Year 1 had the lowest mean rating score of emotional distress and year 5 or more had the highest.

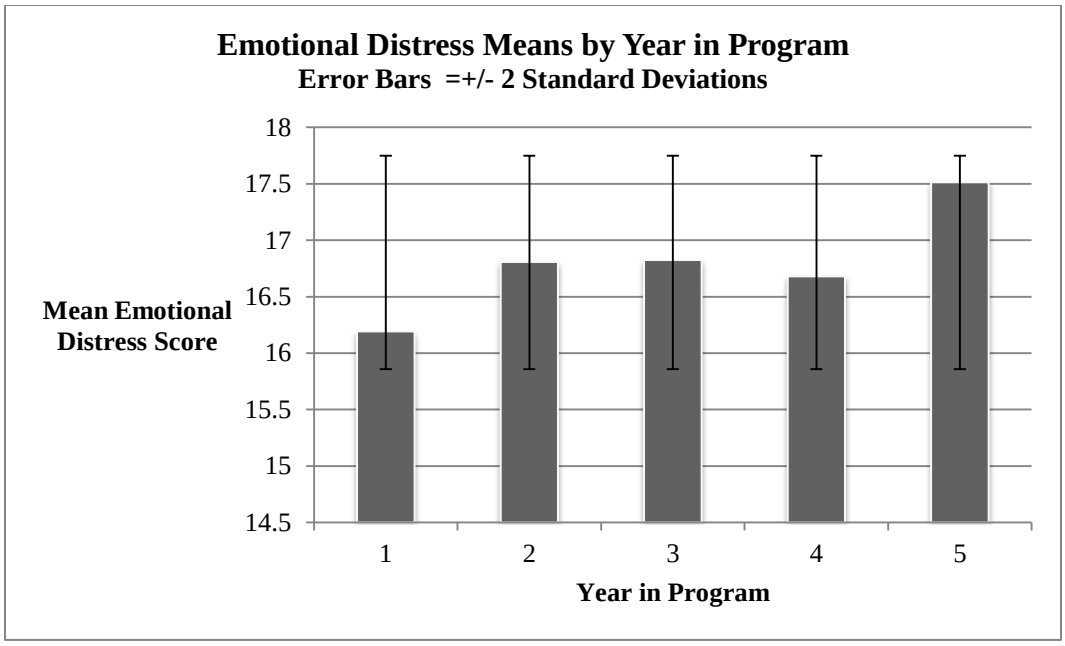

Figure 4-1 Emotional Distress by Year in Program

Research question 2.

What is the prevalence within each of the five years of study that undergraduate college students report feeling depressed within the last year and having ever been diagnosed with depression?

Figure 4-2 presents the percentages (n = 67,453) by year of program of students reporting feeling depressed within the last school year and ever having been diagnosed with depression. Year 1 had the lowest percent reporting feeling depressed and being diagnosed with depression and year 5 had the highest of both.

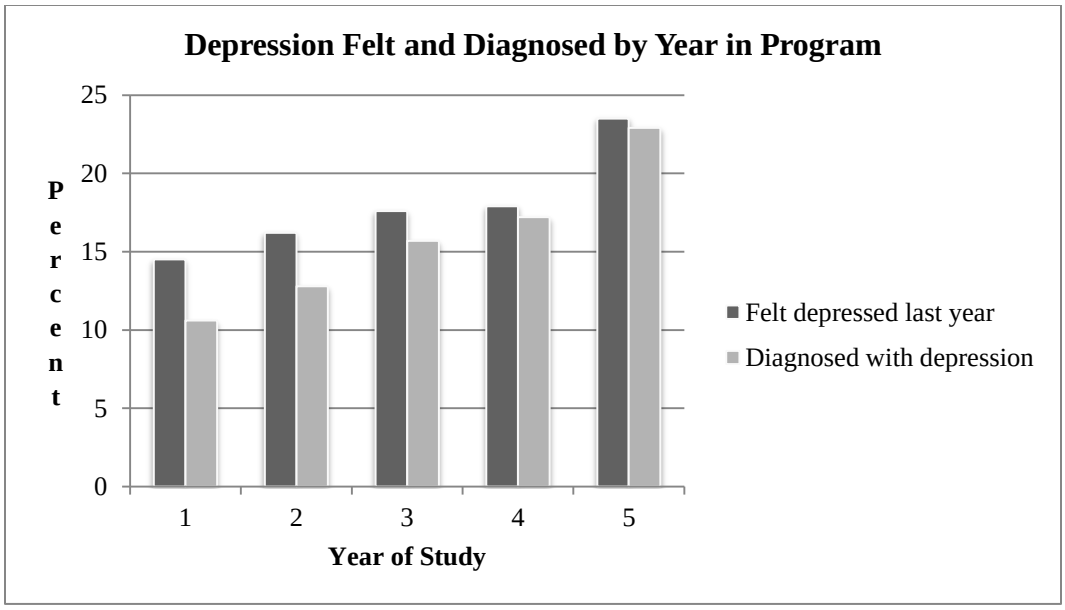

Figure 4-2 Depression Felt and Diagnosed by Year in Program

Research question 3.

Is there a difference by year of study in the prevalence of undergraduate college students reporting emotional distress?

An ANOVA was conducted to investigate if there was a difference in prevalence of emotional distress by year in of study. Results showed a significant difference between the groups ($F(4, 67448) = 29.452$, $p = <0.001$). The means and standard deviations for each year is presented in table 4-8. The Scheffé post hoc test was conducted to determine which years were different from the others. Results revealed the first and fifth year were significantly different from all the other years. These results are displayed in table 4-9.

Table 4-8 Means and Standard Deviations of Emotional Distress Scores by Year in School

Year in School	N	Mean	Standard Deviation
1st year	17872	16.1916	7.92163
2nd year	15883	16.8063	7.95548
3rd year	16468	16.8241	7.96224
4th year	13422	16.6815	7.95374
5th or more years	3808	17.5144	8.40524

Table 4-9 Scheffé Post-hoc Multiple Comparisons with Emotional Distress

					99% Confidence Interval	
(I) Year in School	(J Year in School	Mean Difference (I-J)	Standard Error	Sig.	Lower Bound	Upper Bound
1st year	2nd year	-.61475*	.08695	<.001	-.9316	-.2979
	3rd year	-.63250*	.08613	<.001	-.9464	-.3186
	4th year	-.48991*	.09108	<.001	-.8218	-.1580
	5th or more years	-1.32286*	.14233	<.001	-1.8415	-.8043
2nd year	1st year	.61475*	.08695	<.001	.2979	.9316
	3rd year	-.01775	.08868	1.000	-.3409	.3054
	4th year	.12484	.09349	.776	-.2158	.4655
	5th or more years	-.70811*	.14338	<.001	-1.2324	-.1838
3rd year	1st year	.63250*	.08613	<.001	.3186	.9464
	2nd year	.01775	.08868	1.000	-.3054	.3409
	4th year	.14259	.09273	.669	-.1953	.4805
	5th or more years	-.69036*	.14338	<.001	-1.2128	-.1679

Table 4-9 *continued*

4th year	1st year	.48991*	.09108	<.001	.1580	.8218
	2nd year	-.12484	.09349	.776	-.4655	.2158
	3rd year	-.14259	.09273	.669	-.4805	.1953
	5th or more years	-83295*	.14641	<.001	-1.3664	.2995
5th or more years	1st year	1.32286*	.14232	<.001	.8043	1.8415
	2nd year	.70811*	.14388	<.001	.1838	1.2324
	3rd year	.69036*	.14338	<.001	.1679	1.2128
	4th year	.83295*	.14641	<.001	.2995	1.3664

Research question 4.

What is the prevalence of undergraduate college students reporting impediment of academic performance due to stress or depression/anxiety?

The survey had two questions that inquired about the effect stress or depression/anxiety had on academic performance. Of the 67,993 students who answered the question if stress had lowered their academic performance, 35.8% (*n* = 24,354) indicated it had. Of the 67,934 students who answered the question regarding depression lowered their academic performance, 16.7% (*n* = 11,374) indicated it did. Figure 4-3 presents the students' report of how these affected their performance.

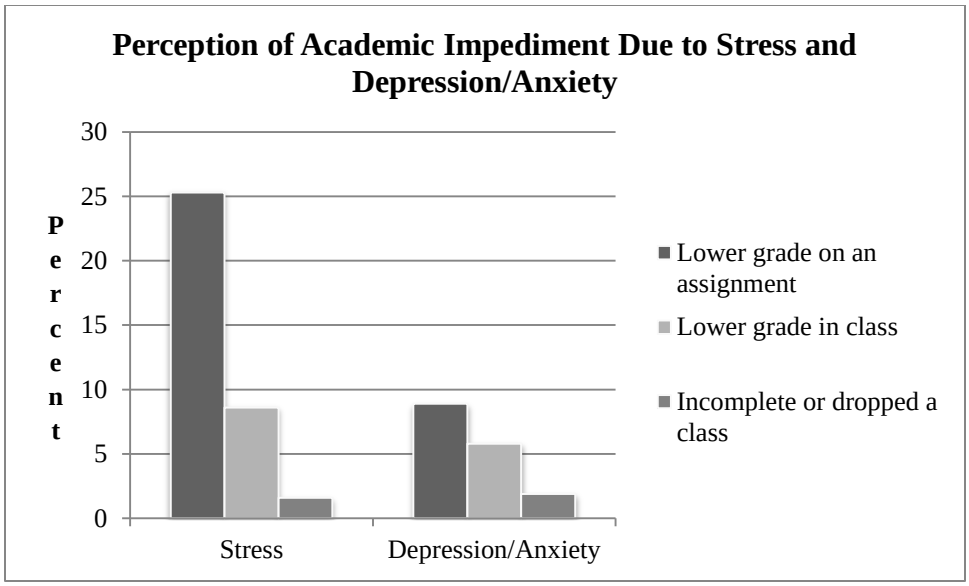

Figure 4-3 Perception of Academic Impairment due to Stress and Depression/Anxiety

Research question 5.

Is there a predictive relationship between recommended lifestyle choices and emotional distress among undergraduate college students?

The two ordinal independent predictors had small category splits when compared to emotional distress. On the lowest end of servings of fruits and vegetables, 3.1% indicated they "did not eat" and on the highest end, 6.2% indicated they ate "5 or more". On the lowest end of awakening feeling rested, 9.1% indicated did on "0 days" and on the highest end, 6.2% indicated did on "7 days." These splits were not large enough to warrant deleting the variables from the analysis (Mertler & Vannatta, 2001).

The stem and leaf plots and box plots indicated a small to moderate number of outliers. Exercise score level 14 had 76 extreme values that were 35 or larger when compared to emotional distress. Awakening feeling rested had 302 extreme values at day 5, 195 at day 6, and 163 at day 7 that were larger than 34 or greater when compared to emotional distress. These outliers were replaced with the accepted maximal value (Mertler & Vannatta, 2001).

Kolmogorov-Smirnov test was conducted to assess for normality on each of the variables. The test was statistically significant indicating the distributions were not normally distributed (Mertler & Vannatta, 2001). Within a large sample, significant results occur even when the deviation from normality is slight (Ghasemi & Zahediasl, 2012). Awakening feeling rested was normally distributed. Transformations were performed in an attempt to improve the skewness and kurtosis of the distribution. Performing a square root transformation on the exercise variable improved skewness, but worsened kurtosis. Performing a square root transformation on servings of fruits and vegetables improved both skewness and kurtosis of the distribution. A log10 transformation on emotional distress improved skewness, but worsened kurtosis. The transformed data were used in the predictive analysis. However, the data were analyzed with only the dependent variable transformed and with none of the variables transformed. Transformation of the dependent variable improved normality (Figure 4-2). However, transformation of the independent variables made almost no difference

in the findings. The results of the two other analyses are presented in Appendix C. Table 4-10 presents the before transformation skewness and kurtosis values and both following transformation.

Table 4-10 Skewness and Kurtosis of Variable Distributions Pre- and Post-transformation

Variable	Before transformation skewness	After transformation skewness	Before transformation kurtosis	After transformation kurtosis
Emotional distress	0.691	-0.189	-0.334	-0.686
Servings fruits/ vegetables	0.622	0.243	-0.063	0.043
Exercise	0.617	0.171	-0.431	-0.978
Awakening rested	0.067	N/A	-0.804	N/A

When conducting multiple linear regression analysis the dependent variable must be approximately normally distributed (Plichta & Kelvin, 2013). This was evaluated using a histogram, Q-Q plot, detrended Q-Q plot, and box plot both before and after transformation. The dependent variable was not normally distributed; however, with large sample size that assumption is not essential (Mertler & Vannatta, 2001).

The Mahalanobis distance test, with an alpha of 0.01, was performed to test for multivariate outliers. Twenty-nine cases were determined to be outliers and were removed from the analysis (Mertler & Vannatta, 2001).Multivariate

normality and linearity were evaluated using a scatterplot matrix. The matrix illustrated that there are weak linear relationships between the variables and the variables were moderately lacking normal distribution. In addition to the pre-analysis screening to assess and correct for assumptions, multicollinearity was assessed from tolerance produced by collinearity statistics analysis (Mertler & Vannatta, 2001). Collinearity statistics indicated tolerance ranging from 0.910 to 0.957. The possible range of tolerance is 0 to 1. Because values closest to 1 indicate a lack of multicollinearity, the predictor values were assessed to have little to no multicollinearity.

Homoscedasticity was assessed with a residuals by predicted values plot The residuals scatterplot (Figure 4-4) shows a somewhat rectangular-shaped distribution falling between three standard deviations. The scatterplot illustrates slight homoscedasticity and non-normality.

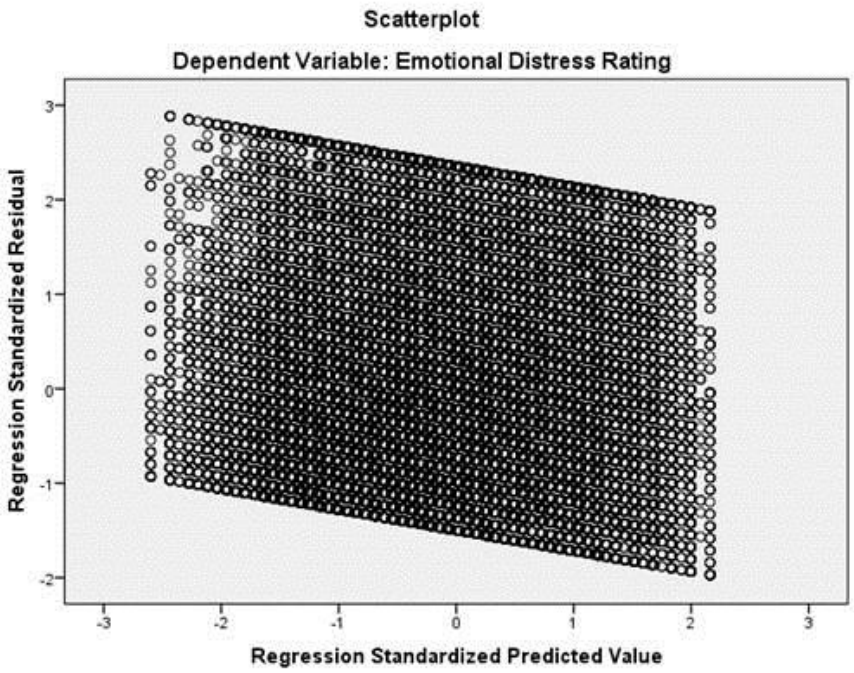

Figure 4-4 Residuals by Predicted Values

Standard multiple linear regression was conducted to determine which predictor variables (servings of fruits/vegetables [fruit/vegetables], exercise [exercise], and awakening feeling rested [rested]) were predictors of emotional distress. Data screening led to the elimination of 29 cases. Evaluation of normality led to square root transformation of fruit/vegetables and exercise and to log10 transformation of emotional distress. Regression results indicate an overall model that included all three predictors (R^2=0.049, R^2_{adj}=0.049, F(3,66429)=1135.170, p<0.001). This model accounted for 4.9% of variance in emotional distress.

Exercise and rest had a negative correlation with emotional distress. Consumption of fruits and vegetables had a positive correlation with emotional distress. In addition, bivariate and partial correlation coefficients between each predictor and the dependent variable are presented in Table 4-11. The review of the beta weights of the three predictor variables showed that awakening feeling rested was the strongest predictor compared to exercise and consumption of fruits and vegetables.

Table 4-11 Coefficients for Final Model

	B	β	T	Bivariate r	Partial r	*p*
Exercise	-0.020	-0.065	-16.431	-0.099	-0.062	<0.001
Fruit/vegetables	0.025	0.025	6.328	-0.014	0.024	<0.001
Rest	-0.022	-0.202	-52.103	-0.212	-0.198	<0.001

Chapter Summary

This chapter included a description of secondary data analyses of the ACHA-NCHA Spring 2008 database to determine if three positive lifestyle choices predicted emotional distress. The sample consisted of 68,559 undergraduate college students. Descriptions of the sample were provided and a multiple linear regression model was computed. The assumption of normality of the dependent variable was moderately violated; however, the large sample size lessened the significance of that assumption. All three predictors (servings of fruits and vegetables, exercise, and awakening feeling rested) were predictive of

emotional distress. The relationships were weak, but statistically significant, with 4.9% of the variance explained.

Chapter 5

Findings

Analysis of the ACHA-NCHA Spring 2008 data set resulted in a predictor model of emotional distress. Additionally, descriptive analysis highlighted information about prevalence of emotional distress and stress, anxiety and depression in undergraduate college students. Interpretation of these findings and comparisons to the findings within the literature is included in this chapter. The chapter concludes with implications of the findings and recommendations for nurses and nurse researchers.

Interpretation of Major Findings

Representativeness of Sample

Approximately 17.3 million undergraduate students are enrolled in degree-granting post-secondary institutions in the United States (Snyder, de Brey, & Dillow, 2016). ACHA collects data every semester from institutions across the United States. The NCHA-ACHA databases contain the most comprehensive collected data on student health. Student participation occurs from random selection of the students or their enrolled courses (ACHA, 2009). This sampling methodology was selected to obtain a representative sample; however, due to the institutions not being selected randomly, sample bias may have occurred. Additionally, there is a fee to become a participating institution, which results in a small list of participating institutions from among all the institutions in the United

States. In this sample, 203 associate degree or higher degree-granting institutions participated out of the 4,627 institutions within the United States (ACHA, 2009; Snyder et al., 2016). Institutions from all 50 states were represented in the database and four from Canada (ACHA, 2009). The sample size was 68,559 after 29 cases were deleted due to multivariate outliers.

Demographic comparisons between the students who participated in the survey and student data from the Department of Education disclosed that the sample had a higher percentage of younger and White students and a higher number enrolled full-time than the national data (ACHA, 2009; Snyder et al., 2016). The reporting mechanisms were different between the national and ACHA agencies, which may account for some of the differences. These national data, except for ethnicity and race, were reported combining undergraduate and graduate student enrollment. The national data were collected from official reporting mechanisms from the institutions, whereas the sample data were collected from students directly. Table 5.1 compares the demographic characteristics from three samples, the ACHA-NCHA Spring 2008, and the Department of Education 2010 and 2015 reports. The rationale for comparing the student characteristics to the national data reported in 2010 was that these data were reported closest to the spring 2008 data of the study and the 2015 report was the most recent. They do not report race and ethnicity in the same manner;

however, it was clear that the sample had more students selecting “white” than the national sample.

Table 5.1 Demographic Characteristics of Sample Compared to National Reports

	ACHA-NCHA (Spring 2008)	United States Department of Education (Fall 2010)	United States Department of Education (Fall 2015)
	%	*%*	*%*
Age*			
18-19 years old	35.8	19.3	19.1
20-21 years old	39.5	19.5	21.1
22-24 years old	16.6	17.8	19.5
25-29 years old	4.0	15.4	14.5
30-34 years old	1.5	8.5	7.2
35 years old and older	2.1	18.2	17.0
Gender			
Females	64.0	57.0	57.3
Males	34.3	42.0	41.7
Race/Ethnicity			
White	73.3	61.6	56.5
Black	4.4	15.1	14
Hispanic	5.9	12.9	12.3
Asian	10.5	6.3	6.6
Pacific Islander	-	6.0	6.3
American Indian/Alaskan Native	-	0.3	0.3
Indian	1.4	-	-
Other	3.8	-	-
Two or more	-	1.0	0.8
International	3.2	-	-
Non-resident alien	-	1.6	3.3
Full-time status*	96.0	62.3	61.5

*Undergraduate and graduate student numbers combined in the national statistics (Snyder et al., 2016)

The differences in age and full-time status may be accounted for by the national statistics combining undergraduate and graduate enrollment. Graduate students generally are going to be older than undergraduate students are and less likely to be enrolled full-time. Although the 96% enrolled full-time within the ACHA-NCHA, data was surprising. Full-time status was defined as anywhere from 12 to 15 hours per semester. In 2013, approximately 50% of the students were enrolled in less than 15 semester hours (Complete College American, 2013). The ACHA-NCHA survey dichotomously asks students if they are enrolled full-time. The U.S. Department of Education data comes from official reports from the institutions (Synder et al., 2016). It is possible the students were classifying full-time status differently than the institutions.

Nationally since the recession beginning in 2007, 62% of undergraduate students have been employed while attending classes, similarly in the sample 58% were employed (Kena et al., 2015). Nationally, 26% of full-time and 35% of part-time students work 20 or more hours a week (Kena et al., 2015). From the sample data, 18% worked 20 or more hours. The students in the sample reported higher percentage of full-time status; therefore, the sample was similar in numbers of students working more than 20 hours a week. National Survey of Student Engagement (NSSE) (2012) data disclosed that students perceived financial concerns as lowering their academic performance. They reported that at times they did not buy course materials due to these concerns (NSSE, 2012). A study of

the effect financial stressors had on academic performance showed that students who had financial stressors were more likely to work longer hours (p=00003) and have a lower grade point average (GPA) (p=0.001), than students with fewer financial stressors (Bennett, McCarty, & Carter, 2015). Of the 231 students who participated in this study, 62% were employed working on average 25 hours per week. Of the students who participated in the study, 67.7% were White and 53.7% were female (Bennett et al., 2015). The characteristics of Bennett et al. (2015) study were similar to the sample characteristics of the current study.

Analysis Discussion

Research question 1.

What is the prevalence within each of the five years of study that undergraduate college students reported emotional distress?

The analysis of the data indicated that the students enrolled in their first year of undergraduate study had lower levels of emotional distress than students enrolled in any of the other years. Inversely, students enrolled in their fifth or more year of study had the highest degree of emotional distress.

Prevalence of emotional distress by year of study has not been studied. Most of the studies focused on the transition period between high school and college. Some researchers suggest that students are at a higher risk of developing emotional distress and depression during transitioning periods (Bernat et al., 2007; Dyson & Renk, 2006; Leino & Kisch, 2005). The transitional factor leading

to emotional stress during the freshman year may be a lack of family understanding of the culture of college that first generation students frequently experience (Jenkins et al., 2013)

Students not only transition into the college environment, but also into the discipline of study. If emotional distress and depression are more likely during periods of transition, then as a student transitions towards graduation, emotional distress could occur. There are no studies on students in the United States examining college student transition through programs and emotional distress. A group of Canadian researchers examined mood and academic success as students moved from Year 1 to Year 4 (Barker, Howard, Galambos, & Wrosch, 2016). They found that freshman had higher stress than any of the other years (Barker et al., 2016). They did not include students enrolled in five or more years. The findings of the current study in comparison to the literature supports that more research is needed to determine the degree of stress that promotes learning compared to when it increases the students' risks of emotional distress.

Research question 2.

What is the prevalence within each of the five years of study that undergraduate college students reported feeling depressed within the last school year and having ever been diagnosed with depression?

Analysis of the data showed that feelings of being depressed were more common than a diagnosis of depression. It also showed incrementally higher

percentages within each year of study of students feeling depressed within the last year. The percent of students reporting feeling depressed within the last year increased sharply for students enrolled in year five or more. This could be due to either delays in completing programs increased feelings of depression or feelings of depression led to academic impediments delaying graduation.

Overall, 14.3% of students had been diagnosed with depression. Within each year of study, incrementally higher percentages reported being diagnosed with depression. This could indicate that students were experiencing more depression as they progressed through their programs of study or that the available mental health professionals and services were more sensitive to recognizing and diagnosing depression.

The literature did not definitively support that students experienced depression more frequently as they progressed through their studies, or that the institutions were recognizing and diagnosing them. No studies were found on the prevalence of depression by year of study. A study by the National Alliance on Mental Illness (NAMI) included 765 college students from 48 states and the District of Columbia (NAMI, 2012). Twenty-seven percent reported depression and 55% had accessed their campus' mental health services. NAMI (2012) concluded that some institutions were effective in recognizing and intervening in student mental health concerns, while many others were not.

Research question 3.

Is there a difference by year of study in the prevalence of undergraduate college students reporting emotional distress?

Students enrolled in year one had lower emotional distress scores than students enrolled in any other year. Students enrolled in year five or more had the highest degree of emotional distress. Statistically, year one and five or more were different than any of the other years. As discussed above, there is a paucity of literature to explain the significance of this finding. It is possible extending the degree plan beyond four years increases emotional distress. It also is possible, emotional distress decreases academic performance, thereby extending the degree plan beyond four years. There is no published literature to compare to this finding.

Examination of each of the five items on the emotional distress scale showed higher means for feeling overwhelmed and exhausted in the last year than feeling hopelessness, very sad, or depressed. These findings were similar to the findings of another study in which feeling overwhelmed and exhausted had higher mean scores in two groups than feeling very sad, hopeless or depressed (Hamilton, 2006). Given the findings of a study where students performed better if there were periods of transient negative mood, it may be a positive indicator of academic performance for students to experience fluctuations of perception of

stress, but remains unclear the relationship between stress and emotional distress (Barker et al., 2016).

Research question 4.

What is the prevalence of undergraduate college students reporting impediment of academic performance due to stress or depression/anxiety?

Students reported that stress often led to a lowered a grade on an assignment. Much less commonly, it led to a lowered grade in a course or taking an incomplete in or dropping a course.

Academic impairment was reported in a variety of ways in the literature limiting the ability to compare this finding to the literature. NAMI (2012) reported 64% of students stated they were no longer attending collage due to a mental health reason with students reporting anxiety (11%) and depression (27%) as the primary reason they left. Only 1.9% of the students surveyed for this study indicated depression/anxiety had led to dropping a course. However, this study collected data on students who remained enrolled; whereas, the NAMI (2012) study examined students who had dropped out of school.

In a study over 10 years ago, 15 predictors of academic performance produced a multiple linear regression model explaining 21.8% of the variance (Larson, Orr, & Warne, 2016). Of the 15 predictors, nine were stressors, including diagnosis with a mental illness, ability to handle stress, and level of stress (Larson et al., 2016). Mental health concerns and emotional distress were not measured

the same in these studies, which limits the ability to compare the results. Further research is indicated to determine if stress, anxiety or depression are risk factors for lowered academic performance.

Research question 5.

Is there a predictive relationship between recommended lifestyle choices and emotional distress among undergraduate college students?

Analysis of the predictive value of consumption of fruits and vegetables, feeling rested when awakening, and exercise in explaining emotional distress in undergraduate college students produced a model that explained only 4.9% of the variance. Each predictor variable had an association with emotional distress.

Exercise and rest had a negative relationship, so that as exercise and rest increased, emotional distress decreased. This was predicted by the theoretical model for the study.

Consuming fruits and vegetables had a negative bivariate correlation with emotional distress; however, had a positive partial correlation with emotional distress. When comparing the consumption of fruits and vegetables to emotional distress, the relationship was a negative one in that as consumption increased, emotional distress decreased. However, after controlling for the other variables through the procedure of the multiple linear regression, the relationship between the two was a positive one indicating that as consumption increased so did emotional distress. Therefore, it is inconclusive as to the relationship this variable

has to emotional distress. The partial correlation squared (r^2=0.00) indicates if the variable was removed from the analysis, there would be almost no change to the overall model (Mertler & Vannatta, 2001).

The review of the beta weights of the three predictor variables showed that awakening feeling rested (β=-0.202, t(66,429)=-52.103, p=0.000) was the strongest predictor compared to exercise (β=-0.064, t(66,429)=-16.431, p=0.000) and consumption of fruits and vegetables (β=0.025, t(66,429)=6.328, p=0.000). None of the published research findings suggested which predictor variable would be the strongest in reducing emotional distress so no comparison can be made.

The results indicated there were other variables that more significantly predict emotional distress in this population. A small effect size had been predicted a priori. Hamilton (2006) had examined negative lifestyle choices and identified predictors of emotional distress that explained 32% of the variance. The Hamilton (2006) study and this study measured emotional distress using the same scale and are the only two studies found to do so.

The analysis contributed minimally to the explained variance of the development of emotional distress in this population. However, it was the first time the predictive influence of positive lifestyle choices on emotional distress had been studied.

Findings Related to the Conceptual Model

This study evaluated the predictive value of three positive lifestyle choices with emotional distress of undergraduate college students. Findings partially supported the conceptual model, although the relationships only explained 4.9% of the variance. The findings suggested that consuming fruits and vegetables was a predictor of emotional distress; however, it is inconclusive if the relationship was a positive or negative one. Awakening feeling rested and exercise were predictors of lower levels of emotional distress.

Descriptive analysis of the variables of emotional distress, depression, and academic impairment provided support for future examination of the relationships among these variables in this population. The model proposed that stress led to emotional distress. This relationship was supported by the descriptive analysis showing that 35.8% of the sample reported that their stress impaired their academic performance. Stress that disrupted a person's daily life was considered emotional distress.

Additionally, the model proposed that emotional distress would lead to depression. This relationship was not supported by this analysis. Although 14.4% of the students reported a diagnosis of depression, information was lacking on the timing of the diagnosis relative to the beginning of their college years. The lack of information prevented a greater understanding of the potential effect of the

transition into and through college on emotional distress that may result in depression.

The model proposed that there were factors that moderated and mediated emotional distress. The analysis weakly supported that awakening feeling rested and exercise moderated emotional distress. It was inconclusive as to whether consuming fruits and vegetables predicted higher or lower levels of emotional distress. In an older study with college students, negative life events, student characteristics, and lifestyle choices explained 32% of the variance in the development of emotional distress in this population (Hamilton, 2006). The current analysis further explained 4.9% of the variance.

Other Possible Explanations of Emotional Distress

Other studies have examined the relationships of moderators and mediators on anxiety, stress tolerance and depression in this population. Family and social support were the most frequently studied moderators of emotional distress. Family support was associated with higher stress tolerance and lower depressive feelings (Bland et al., 2012; Perlman, 1998; Wodka & Barakat, 2004). Lacking family support was associated with loneliness and that loneliness was associated with higher anxiety (Mounts, Valentiner, Anderson, & Boswell, 2006). Differentiating self from the family of origin was predictive of decreased depression symptomology (Hooper & Doehler, 2011). Social support was associated with higher stress tolerance (Bland et al., 2012; Chao, 2011; Pengully

& Dowd, 2003). Social support was associated with less depression symptomology in first generation college students (Jenkins et al., 2011).

Coping styles, self-esteem and hardiness also were factors in higher stress tolerance and lowered anxiety and depressive feelings. Coping styles was associated with higher stress tolerance (Chao, 2011; Sarid, Anson, Yaari, & Margality, 2004; Wodka & Barakat, 2004) and lower reports of anxiety and depressive feelings (Brown & Schiraldi 2004). Higher levels of self-esteem were associated with lower anxiety (Godbey & Courage, 1994; Hughes et. al., 2003) and depressive feelings (Roberts & Monroe, 1992). Hardiness (Pengully & Dowd, 2003) and resilience (Klibert et al., 2012) had a positive relationship with stress tolerance.

Study Limitations

This study was an analysis of secondary data. Limitations associated with secondary data analysis included the lack of control over the wording and format of the survey questions. Out of the over 300 questions on the survey, only four asked about the three predictor variables relevant to the study problem. The data collected about race and ethnicity did not match the categories used when universities report these data to the Department of Education. These differences in categories made a comparison of the race and ethnicity of the sample to the race and ethnicity of the larger population of college students impossible. A time lag existed between the time survey data were collected and the data analysis for this

study occurred. These factors decreased the usefulness of the data in addressing the research problem identified by the researcher.

Another limitation was that this was only the second study to measure the dependent variable using the emotional distress questions within the survey tool. Internal reliability of the five items combined as an emotional distress scale (r=0.88) was supported; however, it was difficult to compare the results to other studies. Additionally, emotional distress has been measured as anxiety, stress intolerance, and depression symptoms in multiple studies. A threat to construct validity was the lack of a standardized definition of emotional distress and how it differs from anxiety, stress intolerance, and depression symptoms. Without stronger construct validity, the findings must be critically considered and the ability to compare the findings to a larger body of literature is limited.

Although students in all 50 states were represented in the sample, sampling occurred among institutions that volunteered for participation and paid a fee to do so. The researchers collecting the original data disclosed that the sample had a higher percentage of White students and students enrolled full-time than the national reports (Snyder et. al., 2016). This limits the generalizability of the study findings. The sample size was large enough to reject the null hypothesis, but the correlations were weak.

The data collected were of student perceptions rather than health care provider diagnosis of emotional distress or actual measurement of the number of

servings of fruits and vegetables, hours the students slept per week, and the amount of time spent exercising. Students made have over- or underestimated their commitment to these variables.

Despite these limitations, the NCHA-ACHA II data sets are the most comprehensive collection of data on college student health. The data are used as the benchmark for many of the comparisons made of other college student studies. The ACHA-NCHA Spring 2008 data set provided information on student emotional distress and allowed for testing the predictive value of three positive lifestyle behaviors on emotional distress. The selection of these three behaviors was made after a thorough review of the literature and in consideration of a conceptual model. The findings make an initial contribution to knowledge in the area of moderators of emotional distress in undergraduate college students.

Conclusion

The current study presented three positive lifestyle choices as predictor variables of emotional distress in undergraduate college students explaining 4.9% of the variance. Another study discovered negative life events and lifestyle choices predicted 32% of the variance (Hamilton, 2006).

The body of literature on predictors of emotional distress in college students is growing. The current study specifically included positive lifestyle choices, whereas most other studies examined negative life events, transitions, support, resilience, and hardiness.

The results of the current study included discovery that emotional distress, stress, anxiety, and depression were more prevalent in year 5 or more of program of study. Examination of emotional distress and depression prevalence throughout the years of study had not been studied previously.

The results of the current study also presented that students within this population felt stress lowered their performance on an assignment; however, did not overall lead to not completing the course. This finding conflicted with the small body of literature on the effect of emotional distress and depression has on academic performance.

Implications for Nursing

Nurses working in college health need strategies for reducing emotional distress of college students and its adverse effects on their education and quality of life. The results of this study showed that students who exercise and rest were slightly more likely to have lower levels of emotional distress. The explained variance was small, but strategies to promote obtaining sleep and participating in regular exercise would be low cost, potentially high volume, solutions. Even small colleges have the resources to promote healthier lifestyles. Realization that a healthier lifestyle may result in diminished emotional distress in this population is a significant finding.

Future Research

The results of this study provide additional information on predictors of emotional distress in undergraduate college students. Another study found that negative lifestyle choices, student characteristics, and life events explained 32% of the variance of emotional distress (Hamilton, 2006). The current study examined three additional variables explaining an additional 4.9% of the variance. Future studies examining the predictive nature of lifestyle choices, life events, health characteristics, and student characteristics using the emotional distress scale found in the ACHA-NCHA Survey would enhance model building and knowledge of factors predicting emotional distress in this population. Additionally, replicating this study using the five questions on the Emotional Distress Scale could improve generalizability of these findings. Establishing a theoretical model that clearly defines the attributes of emotional distress and differentiates it from anxiety, stress intolerance, and depression symptoms would provide a framework for better understanding predictors of emotional distress in this population.

More research is needed examining the development of emotional distress and depression as students transition into college and as they progress through their programs of study. The current study examined groups within each of five categories representing years of study. Longitudinal analysis of student

development of stress, emotional distress, and depression as the student progresses through college is needed.

Chapter Summary

Three positive lifestyle behaviors were found to be predictive of emotional distress among undergraduate college students. The correlations were weak; however, all three variables contributed to the model. Additional findings were that the prevalence of high emotional distress was proportionately higher in 5th year or more students than the other years. The findings added information to what lifestyle choices are predictive of emotional distress; however, much of the variance remains unknown. Study limitations included loss of data collection control, lack of a model that defines emotional distress, and slightly limited generalizability. The findings are useful to nursing as they provide support for low cost, high volume strategies to ease student risk of emotional distress. Future research is needed to explain more of the variance, enhance generalizability, and further develop the model.

Appendix A

Permission to Use the ACHA-NCHA Spring 2008 Data Set

American College Health Association

P.O. Box 28937
Baltimore, MD 21240-8937
Tel: (410) 859-1500
Fax: (410) 859-1510
www.acha.org

September 29, 2009

Robin Lockhart
University of Texas at Arlington
3410 Taft Blvd
Bridwell 308d
Wichita Falls, TX 76308

Dear Robin,

Thank you for submitting a request to utilize ACHA-NCHA data in your study, "Impact Positive Lifestyle Choices have on Emotional Distress in Undergraduate College Students." Your request has been approved and enclosed you will find a CD containing the Spring 2008 ACHA-NCHA Reference Group Dataset.

I have enclosed a copy of our data use guidelines and agreement for your information. Your signed copy is on file in my office.

As stated in the agreement, we would appreciate a copy of any final products that result from your research.

Please don't hesitate to contact me if you have any questions.

Best of luck in your efforts,

Mary Hoban

Mary Hoban, PhD, CHES
Director, ACHA-NCHA Program Office

Enclosure: ACHA-NCHA Data Use Guidelines and Agreement

ACHA NCHA
American College Health Association National College Health Assessment

Data Use Guidelines

The ACHA-NCHA data contain information about high-risk behaviors, and all data are confidential. ACHA will not release data on any institution, nor will it release data sets where it is possible to identify any participating schools. Individuals who are granted access to any ACHA-NCHA data must adhere to ACHA's data use guidelines, which follow. Failure to sign or to adhere to the attached agreement will result in immediate termination of data use privileges.

The accuracy of the users' statistical analyses and the findings they report are not the responsibility of the American College Health Association. ACHA shall not be held liable for improper or incorrect use of the data.

Data Use Agreement

Signing this agreement does not guarantee your request will be approved; however, this section must be complete for your application to be considered.

By signing below, I agree to the following:

- I will reference the American College Health Association when reporting any data obtained from the ACHA-NCHA utilizing the following standard format (items in Arial font are specific to the data you receive and must be completed appropriately):
  American College Health Association. American College Health Association-National College Health Assessment, Fall 2005 & Spring 2006. Baltimore, MD: American College Health Association ; (2/17/2009).
- I will grant access to ACHA-NCHA data to only those individuals specified in this *Data Use Request Form*. Should the need to grant access to additional individuals arise, I will contact the ACHA Research Director immediately.
- If my institution requires, I will obtain all necessary Institutional Review Board (IRB) approval for secondary data analysis prior to beginning my research. and I will provide ACHA with appropriate documentation of IRB approval.
- I will provide ACHA with any final products produced using ACHA-NCHA data, which include but are not limited to: professional journal manuscripts, professional conference presentations, student theses/dissertations, book chapters, policy documents, fact sheets, and brochures.

Signed copy on file at ACHA. 9/3/09

Appendix B

Institutional Review Board Approval From the University of Texas at Arlington

UNIVERSITY OF TEXAS ARLINGTON | OFFICE OF RESEARCH ADMINISTRATION
REGULATORY SERVICES

February 20, 2017

Robin Lockhart
Dr. Jennifer Gray
College of Nursing
University of Texas at Arlington

IRB Approval Inquiry

Ms. Lockhart,

Thank you for contacting the Office of Research Administration; Regulatory Services regarding a study to be conducted using deidentified secondary data (Spring 2008 ACHA-NCHA Reference Group Dataset) that are available through the American College Health Association (ACHA). Upon reviewing the procedures involved with the study, it appears they would not meet the definition of, "research with human subjects" as defined by the Office for Human Research Protections (OHRP) and would therefore not be subject to review or approval by the Institutional Review Board (IRB) at UT Arlington. OHRP defines research as:

- A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. A human subject in research is defined as, "A living individual about whom an investigator conducting research obtains data through intervention or interaction with the individual, or identifiable private information."

From the description of procedures provided, it appears that the existing dataset to be used for your analysis from the American College Health Association (ACHA) will not be identifiable to any specific individual person(s). Since you will not be intervening nor interacting with any human subjects due to the exclusive use of pre-existing data, and the dataset itself contains no identifiable private information about specific individuals, your study does not meet the above definition and is not subject to IRB review.

Please note that although IRB review is not required for this study, there may be other institutional requirements such as Data Use Agreements that pertain to this existing dataset. Please contact Dan Vincenzo, UT Arlington's Agreements Manager, at vincenzo@uta.edu for assistance in processing legal agreements pertaining to the transfer of data between institutions.

I have included the link for decision charts provided from OHRP from which this determination is made for your reference. If the procedures that have been outlined and provided to our office change such that IRB approval might be necessary or you have any questions regarding this determination please do not hesitate to contact us at RegulatoryServices@uta.edu .

Thank You,

Alyson Stearns

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Appendix C

Predictive Analysis With and Without Dependent Variable Transformation Using LOG10

Table C-1 and C-2 present the predictive analysis results with the dependent variable of emotional distress transformed using a log10. A histogram and P-P plot of the standardized residuals follow the table.

Table C-1

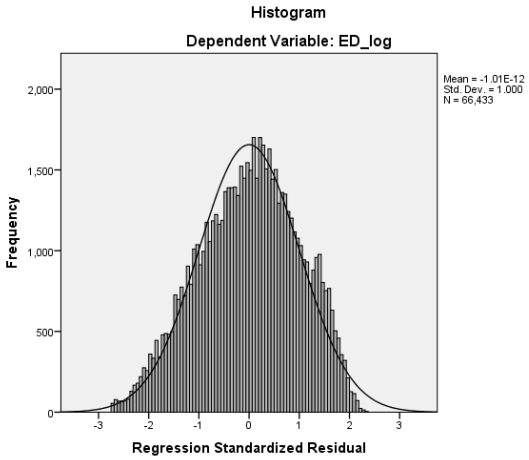
Model Summary with Transformed Dependent Variable (n=66,433)

Model	R	R^2	R^2_{adj}	ΔR^2	F_{chg}	p	df_1	df_2
2	0.221	0.049	0.049	0.049	1136.062	0.000	3	66429

Table C-2

Coefficients for Second Model with Transformed Dependent Variable

	B	B	T	Bivariate r	Partial r
Exercise	-0.004	-0.065	-16.445	-0.098	-0.064
Fruit/vegetables	0.008	0.026	6.756	-0.012	0.026
Rest	-0.022	-0.202	-52.171	-0.212	-0.198



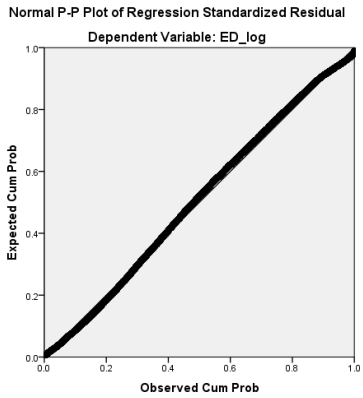


Table C-3 and C-4 present the predictive analysis results with none of the variables transformed. A histogram and P-P plot of the standardized residuals follow the table.

Table C-3

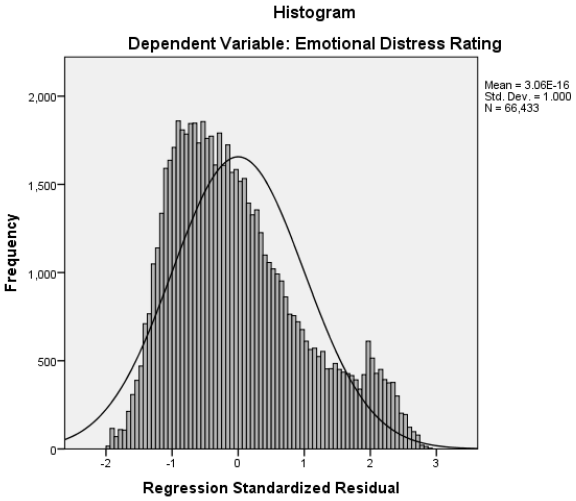
Model Summary without Transformed Data (n=66,433)

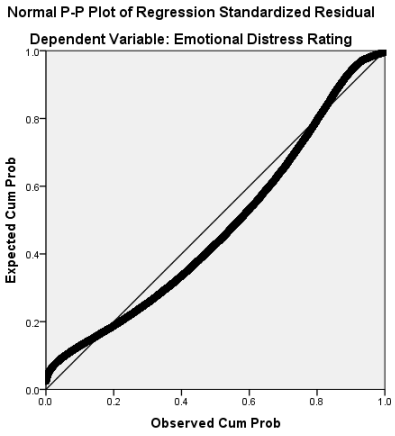
Model	R	R^2	R^2_{adj}	ΔR^2	F_{chg}	p	df_1	df_2
3	0.214	0.046	0.046	0.046	1059.138	0.000	3	66429

Table C-4

Coefficients for Third Model without Transformed Data

	B	B	T	Bivariate r	Partial r
Exercise	-0.137	-0.062	-15.470	-0.094	-0.060
Fruit/vegetables	0.025	0.025	6.328	-0.013	0.024
Rest	-0.022	-0.202	-52.103	-0.205	-0.192


Histogram
Dependent Variable: Emotional Distress Rating
Mean = 3.06E-16
Std. Dev. = 1.000
N = 66,433
Frequency
2,000
1,500
1,000
500
0
-2
-1
0
1
2
3
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Emotional Distress Rating
Expected Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob

Appendix D

ACHA – NCHA Survey

American College Health Association

National College Health Assessment

Instructions:

The following questions ask about various aspects of your health.

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

Select only one response unless instructed otherwise.

Use a No. 2 pencil or blue or black ink pen only. Do not use pens with ink that soaks through the paper. CORRECT: ● INCORRECT: ✓ ✗ ◒ ⊙

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

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

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

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

PAGE ONE

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

1. **Considering your age, how would you describe your general health?**
   ○ Excellent ○ Very good ○ Good ○ Fair ○ Poor ○ Don't know

2. **On which of the following health topics have you ever received information from your college or university? (Select all that apply)**
   ○ Tobacco use prevention
   ○ Alcohol and other drug use prevention
   ○ Sexual assault/relationship violence prevention
   ○ Violence prevention
   ○ Injury prevention and safety
   ○ Suicide prevention
   ○ Pregnancy prevention
   ○ AIDS or HIV infection prevention
   ○ Sexually transmitted disease (STD) prevention
   ○ Dietary behaviors and nutrition
   ○ Physical activity and fitness
   ○ None of the above

(Please mark the best response for each question to the right)	3. Use the scale below to record the BELIEVABILITY of each source of health information. Believable	Neither Believable nor Unbelievable	Unbelievable	4. Do you usually get health-related information from any of the following sources? No	Yes
Leaflets, pamphlets, flyers	○	○	○	○	○
Campus newspaper articles	○	○	○	○	○
Health center medical staff	○	○	○	○	○
Health educators	○	○	○	○	○
Friends	○	○	○	○	○
Resident assistants/advisors	○	○	○	○	○
Parents	○	○	○	○	○
Religious center	○	○	○	○	○
Television	○	○	○	○	○
Magazines	○	○	○	○	○
Campus peer educators	○	○	○	○	○
Faculty/coursework	○	○	○	○	○
Internet/world wide web	○	○	○	○	○
Other: (please specify) _____	○	○	○	○	○

5. Within the **last school year**, how often did you: (Please mark the appropriate column for each row)	Always	Most of the time	Sometimes	Rarely	Never	N/A didn't do this within the last school year
Wear a seatbelt when you rode in a car?	○	○	○	○	○	○
Wear a helmet when you rode a bicycle?	○	○	○	○	○	○
Wear a helmet when you rode a motorcycle?	○	○	○	○	○	○
Wear a helmet when you were inline skating?	○	○	○	○	○	○

6. Within the **last school year**, were you:	Yes	No
In a physical fight?	○	○
Physically assaulted (do not include sexual assault)?	○	○

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	Yes	No
7. Within the **last school year**, have you experienced:		
Verbal threats for sex against your will?	○	○
Sexual touching against your will?	○	○
Attempted sexual penetration (vaginal, anal, oral intercourse) against your will?	○	○
Sexual penetration (vaginal, anal, oral intercourse) against your will?	○	○
8. Within the **last school year**, have you been in a relationship that was:		
Emotionally abusive?	○	○
Physically abusive?	○	○
Sexually abusive?	○	○

The next 11 questions ask about alcohol, tobacco, and drugs.

9. Within the **last 30 days**, on how many days did you use: (Mark one for each row)	Never used	Have used, but not in last 30 days	1-2 days	3-5 days	6-9 days	10-19 days	20-29 days	All 30 days
Cigarettes	○	○	○	○	○	○	○	○
Cigars	○	○	○	○	○	○	○	○
Smokeless tobacco	○	○	○	○	○	○	○	○
Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○	○
Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○
Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○
Amphetamines (diet pills, speed, meth, crank)	○	○	○	○	○	○	○	○
Rohypnol (roofies), GHB or Liquid X (intentional use)	○	○	○	○	○	○	○	○
Other drugs	○	○	○	○	○	○	○	○

10. Within the **last 30 days**, how often do you think the typical student at your school used: State your best estimate. (Mark one for each row)	Never used	One or more days	Used daily
Cigarettes	○	○	○
Cigars	○	○	○
Smokeless tobacco	○	○	○
Alcohol (beer, wine, liquor)	○	○	○
Marijuana (pot, hash, hash oil)	○	○	○
Cocaine (crack, rock, freebase)	○	○	○
Amphetamines (diet pills, speed, meth, crank)	○	○	○
Rohypnol (roofies), GHB or Liquid X (intentional use)	○	○	○
Other drugs	○	○	○

One drink or alcoholic beverage is defined as a 12 oz. beer, a 4 oz. glass of wine, a shot of liquor, or a mixed drink.

11. Within the **last 30 days**, did you: (Mark one for each row)	Not applicable/Don't drink	Not applicable/Don't drive	No	Yes
Drive after drinking any alcohol at all			○	○
Drive after having 5 or more drinks			○	○

12. The last time you "partied"/socialized, how many **hours** did you drink alcohol? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

HOURS

00	○
01	○
02	○
03	○
04	○
05	○
06	○
07	○
08	○
09	○

13. The last time you "partied"/socialized, how many alcoholic **drinks** did you have? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

DRINKS

00	○
01	○
02	○
03	○
04	○
05	○
06	○
07	○
08	○
09	○

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

TIMES

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

DRINKS

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

○ None ○ 1 time ○ 2 times ○ 3 times ○ 4 times ○ 5 times ○ 6 times ○ 7 times ○ 8 times ○ 9 or more times

(Please mark the appropriate column for each row)

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

	Always	Usually	Sometimes	Rarely	Never	Not applicable/Don't drink
Alternate non-alcoholic with alcoholic beverages	○	○	○	○	○	○
Determine, in advance, not to exceed a set number of drinks	○	○	○	○	○	○
Choose not to drink alcohol	○	○	○	○	○	○
Use a designated driver	○	○	○	○	○	○
Eat before and/or during drinking	○	○	○	○	○	○
Have a friend let you know when you've had enough	○	○	○	○	○	○
Keep track of how many drinks you were having	○	○	○	○	○	○
Pace your drinks to 1 or fewer per hour	○	○	○	○	○	○
Avoid drinking games	○	○	○	○	○	○
Drink an alcohol look-alike (non-alcoholic beer, punch etc.)	○	○	○	○	○	○

(Please mark the appropriate column for each row)

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

	Yes	No	Not applicable/Don't drink
Physically injured yourself	○	○	○
Physically injured another person	○	○	○
Been involved in a fight	○	○	○
Did something you later regretted	○	○	○
Forgot where you were or what you did	○	○	○
Had someone use force or threat of force to have sex with you	○	○	○
Had unprotected sex	○	○	○

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

% Used Cigarettes

% Used Alcohol

% Used Rohypnol or GHB

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The next 11 questions ask about sex behavior, perceptions, and contraception.

20. Within the **last school year**, with how many partners, if any, have you had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.) → PARTNERS

21. Within **last school year**, were your sexual partner(s), if any,
- ○ N/A
- ○ Female
- ○ Male
- ○ Both Male and Female

22. Within the **last school year**, with how many partners do you think **the typical student at your school** has had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.) → PARTNERS

(Please mark the appropriate column for each row)

23. Within the **last 30 days**, if you are sexually active, how many times did you have:	Never did this sexual activity	Have not done this during **last 30 days**	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?	○	○	○	○	○	○	○	○
Vaginal intercourse?	○	○	○	○	○	○	○	○
Anal intercourse?	○	○	○	○	○	○	○	○

(Please mark the appropriate column for each row)

24. How many times within the **last 30 days** do you think **the typical student at your school** has had:	0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?	○	○	○	○	○	○	○
Vaginal intercourse?	○	○	○	○	○	○	○
Anal intercourse?	○	○	○	○	○	○	○

(Please mark the appropriate column for each row)

25. Within the **last 30 days**, if you are sexually active, how often did you or your partner(s) use a condom during:	Never did this sexual activity	Have not done this during **last 30 days**	Never	Rarely	Sometimes	Mostly	Always
Oral sex?	○	○	○	○	○	○	○
Vaginal intercourse?	○	○	○	○	○	○	○
Anal intercourse?	○	○	○	○	○	○	○

(Please mark the appropriate column for each row)

26. Within the **last 30 days**, how often do you think **the typical student at your school** has used a condom during:	The typical student at my school does not participate in this sexual activity	Never	Rarely	Sometimes	Mostly	Always
Oral sex?	○	○	○	○	○	○
Vaginal intercourse?	○	○	○	○	○	○
Anal intercourse?	○	○	○	○	○	○

CONDOM USE

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(Please mark the appropriate column for each row)

27. If you are sexually active, did you use a condom the last time you had:

	Never did this sexual activity	No	Yes	Don't know/Don't remember
Oral sex?	○	○	○	○
Vaginal intercourse?	○	○	○	○
Anal intercourse?	○	○	○	○

28. If you have had vaginal intercourse, what method did you or your partner use to prevent pregnancy the last time? (Select all that apply)
- Have not had vaginal intercourse
- Birth control pills
- Depo Provera (shots)
- Norplant (implant)
- Condoms (male or female)
- Diaphragm/Cervical cap/Sponge
- Spermicide (e.g. foam)
- Fertility awareness (calendar, mucous, basal body temperature)
- Withdrawal
- Other method
- Nothing

29. Within the **last school year**, if you are sexually active, have you or your partner(s) used emergency contraception ("morning after pill")?
- No
- Yes
- Don't know
- Not sexually active

30. Within the **last school year**, have you **unintentionally** become pregnant or gotten someone else pregnant?
- Have not had vaginal intercourse within the last school year.
- No
- Yes
- Don't know

31. Have you ever been tested for HIV infection?
- No
- Yes
- Don't know

32. Which of the following best describes you?
- Heterosexual
- Gay/Lesbian
- Bisexual
- Transgendered
- Unsure

33. If you have a credit card(s) how much total credit card debt did you carry last month? That is, what was the total unpaid balance on all of your credit cards (that **you** are responsible for paying)?
- None, I don't have any credit cards/I'm not responsible for paying
- None, I pay the full amount each month
- $1 - $99
- $100 - $249
- $250 - $499
- $500 - $999
- $1,000 - $1,999
- $2,000 - $2,999
- $3,000 - $3,999
- $4,000 - $4,999
- $5,000 - $5,999
- $6,000 or more

34. What is your approximate cumulative grade average?
- A
- B
- C
- D/F
- N/A

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

35. How do you describe your weight?
- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

36. 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

37. Within the **last 30 days**, did you do any of the following? (Select all that apply)
- Exercise to lose weight
- Diet to lose weight
- Vomit or take laxatives to lose weight
- Take diet pills to lose weight
- I didn't do any of the above

38. How many servings of fruits and vegetables do you usually have **per day** (1 serving = 1 medium piece of fruit, 1/2 cup chopped, cooked or canned fruits/vegetables, 3/4 cup fruit/vegetable juice, small bowl of salad greens, or 1/2 cup dried fruit)?
- I don't eat fruits and vegetables
- 1-2
- 3-4
- 5 or more

(Please mark the appropriate column for each row)

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

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Participate in vigorous exercise for at least 20 minutes or moderate exercise for at least 30 minutes?	○	○	○	○	○	○	○	○
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	○	○	○	○	○	○	○	○
Get enough sleep so that you felt rested when you woke up in the morning?	○	○	○	○	○	○	○	○

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The next 4 questions ask about mental and physical health.

(Please mark the appropriate column for each row)

40. Within the **last school year** 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
Felt things were hopeless	○	○	○	○	○	○	○
Felt overwhelmed by all you had to do	○	○	○	○	○	○	○
Felt exhausted (not from physical activity)	○	○	○	○	○	○	○
Felt very sad	○	○	○	○	○	○	○
Felt so depressed that it was difficult to function	○	○	○	○	○	○	○
Seriously considered attempting suicide	○	○	○	○	○	○	○
Attempted suicide	○	○	○	○	○	○	○

41. Have you ever been diagnosed with depression?

○ Yes ○ No

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

	Yes	No
If Yes: Have you been diagnosed with depression within the last school year?	○	○
Are you currently in therapy for depression?	○	○
Are you currently taking medication for depression?	○	○

(Please mark the appropriate column for each row)

42. Have you:

	Yes	No	Don't Know
Been vaccinated against hepatitis B?	○	○	○
Been vaccinated against meningococcal disease (meningococcal meningitis)?	○	○	○
Been vaccinated against varicella (chicken pox)?	○	○	○
Been vaccinated with measles, mumps, rubella (2 shots)?	○	○	○
Been vaccinated against influenza (the flu) in the last year?	○	○	○
Had a dental exam and cleaning in the last year?	○	○	○
(Males) Performed testicular self exam in the last month?	○	○	○
(Females) Performed breast self exam in the last month?	○	○	○
(Females) Had a routine gynecological exam in the last year?	○	○	○
Had your blood pressure checked in the last 2 years?	○	○	○
Had your cholesterol checked in the last 5 years?	○	○	○
Used sunscreen daily?	○	○	○

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

	Have you **ever** been diagnosed with any of the following? Yes	Have you **ever** been diagnosed with any of the following? No	**Within the last school year**, have you had any of the following? Yes	**Within the last school year**, have you had any of the following? No
Allergy problems	○	○	○	○
Anorexia	○	○	○	○
Anxiety Disorder	○	○	○	○
Asthma	○	○	○	○
Bulimia	○	○	○	○
Chronic Fatigue Syndrome	○	○	○	○
Depression	○	○	○	○
Diabetes	○	○	○	○
Endometriosis	○	○	○	○
Genital herpes	○	○	○	○
Genital warts/HPV	○	○	○	○
Hepatitis B or C	○	○	○	○
High blood pressure	○	○	○	○
High cholesterol	○	○	○	○
HIV infection	○	○	○	○
Repetitive stress injury (e.g. carpal tunnel syndrome)	○	○	○	○
Seasonal Affective Disorder	○	○	○	○
Substance abuse problem	○	○	○	○
Back pain	○	○	○	○
Broken bone/fracture	○	○	○	○
Bronchitis	○	○	○	○
Chlamydia	○	○	○	○
Ear infection	○	○	○	○
Gonorrhea	○	○	○	○
Mononucleosis	○	○	○	○
Pelvic Inflammatory Disease	○	○	○	○
Sinus infection	○	○	○	○
Strep throat	○	○	○	○
Tuberculosis	○	○	○	○

The next question asks about impediments to academic performance.

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

44. Within the **last school year**, have any of the following affected your academic performance? (Please select the most serious outcome for each item below)

- Alcohol use
- Allergies
- Assault (physical)
- Assault (sexual)
- Attention Deficit Disorder
- Cold/Flu/Sore throat
- Concern for a troubled friend or family member
- Chronic illness (diabetes, asthma, etc.)
- Chronic pain
- Death of a friend or family member
- Depression/Anxiety Disorder/ Seasonal Affective Disorder
- Drug use
- Eating disorder/problem
- HIV infection
- Injury
- Internet use/computer games
- Learning disability
- Mononucleosis
- Pregnancy (yours or your partner's)
- Relationship difficulty
- Sexually transmitted disease
- Sinus infection/ear infection/bronchitis/strep throat
- Sleep difficulties
- Stress
- Other _____

The last questions ask about demographic characteristics.

45. How old are you? Years

46. What is your sex?
- Female
- Male

47. What is your height in feet and inches? Ft. / Inch

48. What is your weight in pounds? Pounds

49. Year in school:
- 1st year undergraduate
- 2nd year undergraduate
- 3rd year undergraduate
- 4th year undergraduate
- 5th year or more undergraduate
- Graduate or professional
- Adult special
- Other

50. Are you a full-time student?
- Yes
- No

51. How do you usually describe yourself? (Mark all that apply)
- White - not Hispanic (includes Middle Eastern)
- Black - not Hispanic
- Hispanic or Latino
- Asian or Pacific Islander
- American Indian or Alaskan Native
- Other

52. Are you an international student?
- Yes
- No

53. What is your current relationship status?
- Single
- Married/domestic partner
- Engaged or committed dating relationship
- Separated
- Divorced
- Widowed

54. Where do you currently live?
- Campus residence hall
- Fraternity or sorority house
- Other university/college housing
- Off-campus housing
- Parent/guardian's home
- Other

55. Are you a member of a social fraternity or sorority? (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)
- Yes
- No

56. How many hours a week do you **work for pay**?
- 0 hours
- 1-9 hours
- 10-19 hours
- 20-29 hours
- 30-39 hours
- 40 hours
- more than 40 hours

57. 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

58. Do you have **any kind** of health insurance (including prepaid plans such as HMOs - health maintenance organizations)?
- Yes
- No
- Not sure

337 spine part

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THANK YOU FOR COMPLETING THIS SURVEY

SERIAL #

PLEASE DO NOT WRITE IN THIS AREA

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Biographical Information

Robin Lockhart received her ADN and BSN from Midwestern State University in Wichita Falls, Texas in 1985 and 1989. She received her MSN with a Nurse Administrator focus from the University of Texas at Arlington in 1992. She received her PhD from the University of Texas at Arlington in 2017.

For the past 24 years, Robin Lockhart has taught at Midwestern State University in the BSN, RN to BSN, and MSN programs. Currently she is the BSN Programs' Coordinator at Midwestern State University. She has taught in the RN to BSN and MSN programs at Kaplan University for the last five years. She has held the CNE since 2008.

Robin Lockhart practiced for six years in the Emergency Department at Kell West Regional Hospital in Wichita Falls, Texas. Before that, she practiced since 1985 at area hospitals in areas such as medical-surgical, critical care, cardiac care, and emergency care and served as house supervisor.

Robin Lockhart's research interests include student retention, NCLEX-RN success, and connecting classroom, clinical and simulation experiences. She served as the research coordinator for an innovation grant in 2004 that lead to the initiation of the simulation center at Midwestern State University. She also was co-director of an innovation grant in 2014 expanding the capacity of the simulation center. She plans to continue with her research interests in improving learning conditions for nursing students.