HEALTHY LIVING ENVIRONMENT IN THE PREDICTION OF STRESS AND DEPRESSION LEVELS OF UNDERGRADUATE COLLEGE STUDENTS

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A DISSERTATION

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ABSTRACT

This study was conducted to investigate if various independent variables could be used in the prediction of stress and depression levels of undergraduate college students. Ninety-eight percent of college students state they have experienced stress within the past year, with 53% reporting tremendous amounts of stress. The stressors faced by these students result in decreased academic performance, family problems, relationship problems, and job difficulties, to name a few (NCHA, 2011). Therefore, the timeliness of the topic seems most appropriate. The prediction variables used in the two multiple linear regression models were healthy living resident, student athlete, gender, ethnicity, and classification. The researcher sought to understand both the stress and depression levels of undergraduate college students through a survey administered to all undergraduate students attending a 4-year regional university in the fall of 2009 (N = 492). Three groups were identified from the sample, healthy living residents, student athletes, and the general student population. The responses from the survey plus the demographic data were analyzed using both descriptive and inferential statistics. The findings of the quantitative data analyzed from the survey yielded statistically significant models for both stress and depression. However, not all of the predictor variables independently contributed to the model. The stress model only had two independent variables which significantly contributed to the model; student athletes and gender, while the depression model only had one significant predictor in student athletes. The findings were unexpected in that the researcher’s initial hypothesis had healthy living residents providing the greatest contribution to both models. However, the findings of this study will assist student affairs personnel and administrators in the
development of new programs. The researcher concludes that there may be a law of diminishing return as students become too involved in programs and extracurricular activities outside of their academic endeavors (Astin, 1975). Developers of holistic programs should be aware of this finding in their establishment of such programs. Future research should focus on distinguishing at what point students’ affective skills, mainly stress and depression, become weakened with their level of involvement.
DEDICATION

This dissertation is dedicated to everyone who helped me and guided me through the trials and tribulations of creating this manuscript, in particular, my husband and daughter, parents, co-workers, and dissertation committee.
**LIST OF ABBREVIATIONS AND SYMBOLS**

- **B**: Unstandardized regression coefficients
- **β**: Beta, standardized regression coefficients
- **D**: Law of diminishing returns
- **df**: Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
- **∑**: Sigma, Summation
- **f^2**: Effect size
- **F**: F-distribution variable
- **H_o**: Null hypothesis
- **H_1**: Alternative hypothesis
- **k**: Number of groups within the independent variable
- **m**: Number of independent variables
- **M**: Mean: the sum of a set of measurements divided by the number of measurements in the set
- **n**: Sample size
- **N**: Population size
- **p**: The attained level of significance
- **r**: Pearson product-moment correlation
- **r^2**: Coefficient of determination
- **R**: Sample correlation coefficient
R² Multiple correlation coefficient

Adj. R² Serves the same purpose as the R-square but applies a statistical penalty for each added independent variable

SD Sample standard deviation

SE Standard errors of the regression coefficients

sr² Semi-partial correlation

t Tests the hypothesis that a population regression coefficient β is zero

VIF Variance inflation factor

x² Chi-square distribution

z z-score, standard normal variable

α Level of significance

> Greater than

< Less than

= Equal to

* Significant at the .05 level

** Significant at the .01 level

*** Significant at the .001 level
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## CONTENTS

ABSTRACT .................................................................................................................... ii

DEDICATION ................................................................................................................... iv

LIST OF ABBREVIATIONS AND SYMBOLS .............................................................. v

ACKNOWLEDGMENTS ............................................................................................... vii

LIST OF TABLES ......................................................................................................... xiii

LIST OF FIGURES ....................................................................................................... xiv

1. INTRODUCTION ...................................................................................................... 1
   a. Statement of Problem ....................................................................................... 11
   b. Purpose and Significance of the Study ......................................................... 12
   c. Organization of the Dissertation ................................................................. 15

2. LITERATURE REVIEW ............................................................................................ 16
   a. Development of the University Counseling Center ..................................... 18
   b. The Modern University .................................................................................. 20
   c. Astin’s Theory of Student Involvement ...................................................... 21
   d. Defining Stress ............................................................................................... 27
      i. Eustress vs. distress.................................................................................... 28
      ii. Fight or flight ............................................................................................ 29
   e. Stress as it Relates to College Students ..................................................... 30
   f. Defining Depression ....................................................................................... 31
   g. Perfectionism, Stress and Depression of College Students ..................... 34
h. The Benefits of Student Involvement ..........................................................35
i. Student involvement and stress....................................................................36
   1. The benefits of a healthy lifestyle ...............................................................37
   2. The benefits of establishing healthy relationships ....................................39
   3. The benefits of developing study skills ....................................................40
   4. The benefits of spiritual development programs ......................................42
j. The Benefits of a Holistic Approach to Student Development .................43
k. Stress and the Student Athlete ....................................................................44
l. The Benefits of a Healthy Living Residence Hall ........................................46
m. Conceptual Framework – SPICES Model of Wellness ...............................48
n. Summary of Literature Review ..................................................................51

3. METHODOLOGY ....................................................................................52
   a. Research Questions ..................................................................................53
   b. Null Hypothesis ......................................................................................54
   c. Population and Sample ...........................................................................54
   d. Instrument ...............................................................................................57
   i. Beck Depression Inventory-II .................................................................57
   ii. State-Trait Anxiety Inventory ................................................................59
   e. Procedures ..............................................................................................60
   i. Healthy living residents ..........................................................................60
   ii. Student Athletes .....................................................................................62
iii. Criterion Group..........................................................................................63
f. Analysis of Data ............................................................................................64
i. Analysis of Survey Questions........................................................................64
    1. Trait Anxiety Inventory ............................................................................64
    2. Beck Depression Inventory-II .................................................................66
ii. Cronbach’s Alpha .......................................................................................68
g. Conclusion .....................................................................................................68
4. RESULTS .......................................................................................................70
a. Descriptive Analysis ....................................................................................70
b. Stress and Depression Scale Analysis..........................................................71
c. Multiple Linear Regression Analyses ..........................................................73
i. Assumptions of Multiple Linear Regression .................................................74
    1. Sample size ...............................................................................................74
    2. Outlier analysis ..........................................................................................75
d. Multiple Linear Regression Analysis............................................................76
i. Stress Scores .................................................................................................77
ii. Depression Scores .........................................................................................80
e. Summary of Results .....................................................................................83
5. DISCUSSION ..................................................................................................85
a. Discussion of Results ...................................................................................90
b. Summary Statement ......................................................................................93
c. Implications for Future Research ...........................................................94

 d. Implications for Practice .................................................................97

 e. Relationship of Results to Theory ......................................................98

 f. Limitations of the Study ........................................................................103

 g. Conclusions ..........................................................................................104

 REFERENCES ........................................................................................107

 APPENDIX A. Health Risk Appraisal Tool ............................................117

 APPENDIX B. Data Dictionary ..............................................................135

 APPENDIX C. IRB Approval for Research ..............................................136
LIST OF TABLES

3.1 Sample to Population Comparison..............................................................55
4.1 Descriptive Statistics of the Sample .........................................................71
4.2 Crosstabs of Sample by Environment, Gender, Ethnicity, & Class ..........71
4.3 Descriptive Statistics of Stress and Depression Data ............................73
4.4 Standard Multiple Regression: Stress Score ............................................78
4.5 Standard Multiple Regression: Depression Score .....................................81
LIST OF FIGURES

2.1 Astin’s Input Environmental Outcome (I-E-O) Model ......................... 23
2.2 SPICES Model of Wellness ................................................................. 49
2.3 Conceptual Framework .................................................................... 50
3.1 SPICES Model of Wellness ................................................................. 61
4.1 Histogram of Stress Scores ................................................................. 79
4.2 Scatterplot of Residuals by Predicted Values of Stress ....................... 80
4.3 Histogram of Depression Scores ........................................................ 82
4.4 Scatterplot of Residuals by Predicted Values of Depression ............... 83
5.1 Conceptual Framework .................................................................... 100
5.2 Revised Conceptual Framework ........................................................ 102
CHAPTER 1
INTRODUCTION

Our lives have become extremely fast-paced and there just doesn’t seem to be enough time. The need to meet all of the demands of daily life can be overwhelming to some. Many individuals in the United States are experiencing stress and depression on a daily basis; it has been found that in a one-year period 18.8 million Americans will suffer from a depressive illness (Bellinir, 2002). Depression is defined as:

A medical illness that affects how you feel, think and behave causing persistent feelings of sadness and loss of interest in previously enjoyed activities.

Depression can lead to a variety of emotional and physical problems. Depression is a chronic illness that usually requires long-term treatment (Diagnostic and Statistical Manual of Mental Disorders-5, 2013, p. 296.21(F32.0)).

Stress and depression are not mutually exclusive events in an individual’s life. Stressful events can lead to depression and vice versa. Hammen and Cochran (1981) found that depressed college students experienced more stressors than non-depressed students indicating a correlation between stress and depression. The American Psychological Association (APA) conducted a survey in 2007 and found that a third of Americans suffer from extreme stress that affects their daily lives, which in turn accounts for the majority of individuals in our nation experiencing depressive symptoms (APA, 2007). High school graduates entering their first year of college, as well as the existing higher education community of students, are not excluded from these statistics.
Upon graduation from high school an individual, if he or she so chooses, is propelled into higher education without any knowledge of the environment. These new students are faced with a myriad of challenges and opportunities daily. They are immediately responsible for themselves and their actions. Most have left behind high school friends and are embarking on a journey alone. Some will move to a new location, away from their family and friends, and they must learn their way around a new city and establish an identity aside from what they have always known. The new environment and the changes they will experience can lead to extreme stress which can have a negative outcome for many areas of their lives including their physical, mental, social, and academic interests (Friedlander, Reid, Shupak, & Cribbie, 2007). However, before we delve into these stressors faced by college students we must first define the term stress.

Stress has been studied by many researchers and has many different definitions. However, one of the most influential authors on the topic is Hans Selye. Selye defines stress as “the nonspecific response of the body to any demand made upon it” (Selye, 1936, p. 32). Another distinguished researcher in the field, Cohen, defines stress as a process in which, “environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease” (Cohen, Kessler, & Gordon, 1997, p. 3). Although the majority of Cohen’s focus is on the physiological outcomes of stress, he does discuss the emotional and social consequences as well. Multiple stressful situations increase the demands upon the person thus increasing the possibility for biological, physiological, and mental vulnerability. Stress is not only the environmental circumstances individuals encounter, but how they interpret the situation and how well they believe they are equipped to handle it are important in defining stress as well (Cohen, Kessler, & Gordon, 1997). Cohen focuses much of his research on social support and how it can reduce
stress levels. He states (Cohen, 1992; Cohen, 2004; Cohen & Wills, 1985), that individuals with good social support systems are less prone to stress than those that lack these resources, with the latter becoming more susceptible to anxiety and depression. He goes on to posit that social networks may assist in preventing undesirable consequences. Cohen’s hypothesis could very well be applied to a college atmosphere, insinuating that students who have strong social networks are more likely to perform better academically. Wilcox, Winn, and Fyvie-Gauld (2006) found this to be true with results indicating that first-year freshmen who develop a social network early on did better academically and had a higher retention rate than those who did not get involved in a social network. Interestingly enough the individual who is experiencing a stressful event does not necessarily have to receive support to lessen the stress but only needs to know it’s available (Cohen, Gottlieb, & Underwood, 2000). This has major implications in the higher education field. This insinuates that the stressful transition from high school to college life could be somewhat alleviated by only the knowledge of resources being available, whether they are actually utilized or not.

College students are faced with many new experiences, opportunities, and challenges throughout their college career. First-time freshmen are thrust into a new environment and are faced with unfamiliar experiences daily. These students must learn how to make decisions largely on their own, regarding their time management, financial responsibilities, and their overall well-being (Wilcox, Winn, & Fyvie-Gauld, 2006). In conjunction with attending classes and studying, they must establish a new social network. Studies have found an increase in stress levels of incoming freshmen throughout their first year of college (D’Zurilla & Sheedy, 1991; Pritchard, Milligan, Elgin, Rush, & Shea, 2007; Towbes & Cohen, 1996). Britz and Pappas (2010) found that 50% of their freshmen sample reported high levels of stress, mainly in the
areas of time management and excess course work. Humphrey’s (2003) research coincides with these findings and states there are three major stressors placed upon college students: academic problems, time constraints, and finances. Furthermore, Broughman, Zail, Mendoza, and Miller (2009) concur with these findings and state that the following are major stressors experienced by college students: desire to make good grades, lack of income, family pressures, personal relationships, and everyday disturbances. The effects of these stressful events, as reported by college students, brought feelings of anxiety, fear and frustration, as well as, less sleep, stomach issues, and headaches (Humphrey, 2003). Much of the current literature focuses on first time freshmen and stress, with little research focusing on stress at varying levels of college. However, the above research could be related to all students regardless of classification due to the fact that all deal with time management issues and high levels of academic coursework. The current research assessed this assumption in hypothesizing that while freshmen students do experience elevated levels of stress when compared to their peers, all classification levels experience some form of stress during their academic journey. Furthermore, in the evaluation of minority groups and gender the literature has found the stress and depression levels to be statistically different for both groups.

Men and women are different in a multitude of ways and the way in which they handle daily pressures is no exception. When comparing gender it has been found that differences exist between male and female students, with female students reporting significantly higher levels of stress than males (Hudd et al., 2000). The gender difference may be due to females being more in tune with their emotions and realizing and reporting stress more often than males. This implies that females may be more willing to articulate their stressful feelings while males may store those feelings internally, which would postulate that the stressful experiences actually faced by
males may be drastically underreported. Furthermore, ethnic minorities have demonstrated elevated stress and depression levels when compared to non-monitory peers (Greer & Chwalisz, 2007; Kingsbury, 2011). The current research evaluated if gender and ethnicity are in fact significant variables in predicting stress and depression levels of college students.

The research surrounding the topic of stress is immense. In reviewing the literature it is evident that a general definition of stress is nonexistent. Stress seems to mean different things to different people in different situations. College students were asked to define what stress means to them. Over 40% of the responses included the word pressure. Other key words were tension, frustration and strain. Humphrey states that virtually none of the responses portrayed stress in a positive manner (Humphrey, 2003). This is interesting because there is a “good” stress. Greenberg (2009) defines this “good stress or eustress as, “stress that results in positive consequences such as enhanced performance or personal growth” (p. 71). Students can experience eustress by being better prepared for a difficult assignment and ultimately discovering their hard work paid off. However, while experiencing a stressful event it may be difficult to regard it as positive, but once an individual makes it through the experience they may recall it as such.

College can be a very overwhelming time in a young person’s life and this can lead to many stressful circumstances. Students who experience a lot of stressful events and who do not cope with them effectively may have a decrease in grades, loss of relationships, health issues, and diminished self-worth (Britz & Papas, 2010). Students who report higher levels of stress reported drinking more soda, consuming more junk food and exercising less than non-stressed students. Furthermore, stressed students reported significant dissatisfaction with their overall health, fitness level, weight and grade point average when compared to non-stressed students.
These stress-related outcomes can cause additional stress which perpetuates the cycle. For example, as some students embark on their college journey dietary habits and exercise routines become secondary (Hudd et al., 2000). Therefore, students tend to gain weight during the first year of college due to the transition (Crombie, Ilich, Dutton, Panton, & Abood, 2009). Crombie et al. (2009) also found that the added weight can affect a person’s self-worth and confidence creating a depressive environment for the student, which then can lead to additional stress. Additionally, there are far more serious outcomes related to stress. Chronic stress can lead to depression which can ultimately lead to suicidal thoughts or actions (Garlow et al., 2008). The National College Health Assessment Survey was administered by the American College Health Association in 2011 to 15,977 students and it was found that 61.6% of the respondents stated they had felt ‘hopeless’ at least once in the previous school year with 33.4% of those experiencing hopelessness three or more times. Furthermore, the assessment found that 9.5% of college students have seriously considered attempting suicide and 1.5% had attempted suicide in the past year (Kisch, Leino, & Silverman, 2000).

Institutions like the one being evaluated here are developing techniques to assist students in coping with the stressors associated with the transition to higher education. A few of these techniques involve communicating the importance of student life, helping students get physically active, and the creation of healthy living programs and facilities (Finn, 1996; Hudd et al., 2000; Liu & Liu, 2000). Colleges across the country have seen the benefits of student involvement on their campuses in assisting students during their transition. The literature supports these claims by stating that support from friends helps students cope with stressful situations. Swenson, Nordstrom, and Hiester (2008) found that new freshmen who established a close college friend during their first semester had an easier transition than those who did not. The study implies that
involvement in student activities on campus can have a positive impact on the first year of college life for first time students.

Also, the literature suggests that students who are active perform better academically. Exercise is a great stress reducer and can relieve some of the pressures associated with college life (Warburton, Gledhill, & Quinney, 2001). This would imply that athletes should exhibit lower stress levels than the normal college population. Hudd et al. (2000) found this to be true, with athletes significantly reporting lower stress levels than non-athletes. However, this was self-reported information from students who stated if they were athletic, not necessarily involved in collegiate athletics. Stevens, Loudon, Yow, Humphrey, and Bowden’s (2013) research states that athletes are involved in a fast-paced, high stress environment that may counteract exercise as a stress reducer. An assumption can be made, given the above findings that moderate levels of exercise are beneficial in reducing stress, but competitive athletics may lead to increased stress levels among college athletes.

The last intervention mentioned involves the establishment of holistic healthy living residence halls on college campuses. These on-campus living options have been around for more than two decades. However, the literature is sparse regarding the benefits these facilities and holistic resources have on student success. Many of the wellness programs currently on college campuses are not resident-centered. Meaning these programs are available to all students regardless of living arrangements. Furthermore, most programs simply focus on abstention from alcohol and drugs and do not focus on the other factors affecting development (Finn, 1996).

The model utilized in this study is an all-encompassing program that focuses on social, physical, intellectual, cultural, environmental and spiritual aspects of student development and wellness (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011). This model will be discussed
in more detail shortly. The hypothesis of the researcher was such that the student’s living
environment would be an adequate variable in the prediction of stress and depression levels of
college students. The reason is related to the friendships formed immediately upon entering the
residence hall. This environment typically results in clean living of the individual, which
includes quiet time daily for studying and refraining from alcohol and drug use (McIntosh,
Renfroe, Vaughn, Mayes, & Jacques, 2011). The researcher hopes that the results of this study
will provide information as to what colleges can do to further assist students with the pressures
they face while obtaining their degree. Does student engagement matter? What can colleges and
universities do to assist students in their development? The research is extensive when it comes
to student development theory. Astin (1984) simplifies these theories by discussing the one focus
he feels is critical to student’s affective development, student involvement. Through Astin’s
student involvement research a negative relationship has been found between reported stress and
depression scores and level of student involvement. A general review of Astin’s student
involvement theory will follow, as well as a more narrow focus as it relates to the affective skills
developed during college.

The transition from high school to college can be an extremely demanding and stressful
time in a young person’s life. How an individual progresses through their college years has been
studied by many researchers. Astin’s student development theory, which is based on student
involvement, is a much respected work on the subject (Astin, 1984). Quite simply, Astin defines
“a highly involved student as one who, for example, devotes considerable energy to studying,
spends much time on campus, participates actively in student organizations, and interacts
frequently with faculty members and other students” (Astin, 1984, p. 518). Astin’s research
found that level of student involvement is positively correlated to student success. One particular
area of interest is the affective skills developed by students who are involved. These students, according to Astin, are better equipped to handle stressful situations and therefore report lower stress and depression scores when compared to their uninvolved peers. Additional research on the topic of stress and depression concur with these findings (Cohen, 1992; Cohen, 2004; Cohen & Wills, 1985; Schlossberg, 1989). The benefits of student involvement are numerous.

The earlier work of Astin (1975) found that students’ affective skills were significantly influenced by their level of involvement. Interestingly enough, one of the most significant factors related to the development of these skills was their residency status. He posits that students who live on campus are immersed into the university environment and therefore have more opportunity to get involved. This indicates that on-campus living increases student involvement and as an outcome students’ affective skills are sharpened. He states that “by “eating, sleeping, and spending their waking hours on the college campus” residential students have a better chance than do commuter students of developing a strong identification and attachment to undergraduate life (Astin, 1999, p. 523). Another strong factor in the development of these affective skills was the joining of an organization or participation in a multitude of extracurricular activities available to students. One of the strongest organized groups, intercollegiate athletics, was found to be highly correlated with student involvement. Astin (1975) discusses the obvious reason for this involvement in that these athletes represent the university and feel an attachment to the organization through their sport. Furthermore, the students involved in campus organizations and clubs are in constant contact with faculty, staff, and students and feel a connection to the campus community as a whole. Again, Astin (1975) found that as these resources become available and students become more involved a direct outcome of that involvement is lowered stress and depression levels experienced by these students.
Astin’s involvement theory is not as simple as students just being involved. He discusses five hypotheses that feed into the theory of involvement. Much of these hypotheses are based on what the student does and how they behave, rather than their feelings and emotions (Astin, 1999). The student involvement theory in its current stage has five assumptions, or as Astin refers to them postulates (Astin, 1999). First, involvement indicates an energy that is exerted by the student both psychologically and physically. Secondly, involvement takes place along a continuum. Implying that students demonstrate differing levels of involvement throughout their educational journey focusing on different objects at separate times. Astin defines these objects as exceedingly comprehensive (the overall student experience) or exceedingly specific (studying for a test). The third postulate argues that involvement is both quantitative and qualitative. Student involvement can be measured a multitude of ways either through gathering of data or through interviews and observations. The remaining two postulates are actually referred to by Astin as propositions due to the fact that evidence needs to be gathered from these to recommend more effective academic programs (Astin, 1999). The fourth proposition states that success in an academic program is directly related to the amount of involvement in that program, both quantitatively and qualitatively. The last proposition declares that the success of any educational policy or program is directly related to the potential amount of student involvement within. 

Along with these postulates, Astin (1984) states that there are three core elements to student involvement theory: inputs (what a student brings with them), environment (college experiences), and outcomes (what a student takes with them upon graduation). These elements will be discussed in detail in chapter two. It was the hypothesis of the researcher that student involvement does have a direct correlation with stress and depression levels of college students. Given Astin’s findings of student success, as it relates to the development of affective skills,
being directly related to on-campus housing it is considered that these on-campus residents have lower anxiety and depression levels when compared to their peers.

**Statement of Problem**

Most of the research that evaluates incorporating a healthy living approach to student success focuses on one or more areas, including but not limited to, abstaining from alcohol/drugs, healthy diet, exercise, time management, spiritual development, stress management, and counseling services (Britz & Pappas, 2010; Hanson, Drumheller, Mallard, McKee, & Schlegel, 2011; Love & Talbott, 1999). Even though these resources have shown improvements in overall student well-being and grades, it can be argued that the current self-reported stress and depression levels indicate there is still work to be done. As the statistics state, suicide attempts are most prevalent between the ages of 15-24 (American Foundation for Suicide Prevention, 2012). Furthermore, in 2011 The National College Health Assessment (NCHA) found that 5% of students reported that they had intentionally hurt themselves within the past year. Of the sample, 19.3% had considered committing suicide in their lifetime with 7.5% attempting. Clearly there is still much to be done in the area of ensuring that students see their worth and in assisting them with the proper coping skills in lowering their stress and depression levels. Maybe the answer is combining the above resources into one holistic approach to wellness, a healthy living environment.

Little empirical research exist that measures the effects of a holistic healthy living community on students’ stress and depression levels. The current research evaluated if using healthy living residents and student athletes as predictor variables are useful in determining stress and depression levels of college students. The inclusion of student athletes in this study was to evaluate if a high pressure environment such as performing athletically counters the
benefits of involvement as it relates to stress and depression levels of college students. Simply put, can students be too involved? Student athletes have numerous resources at their disposal, all while maintaining a relatively healthy lifestyle with vigorous exercise. Studies have shown that the college athlete reports lower stress and depression levels when compared to those who do not compete at the collegiate level (Hudd et al., 2000). Proctor and Boan-Lenzo (2010) found that male students who did not participate in collegiate athletics reported a 13.8% higher prevalence of depression when compared to male student athletes. Given the similarities between the resources provided to both healthy living residents and student athletes it would be assumed that both would be good predictors in evaluating stress and depression levels, with both exhibiting lower levels than students not in either category. The current research measured this assumption.

In summary, the purpose of colleges and universities is to graduate educated, well-rounded citizens and in doing so they must find the proper resources in ensuring their students are healthy and engaged so they can perform to their full potential (Chan, Brown, & Ludlow, 2014). Due to the limited research on the topic of a holistic approach to wellness this study findings will hopefully assist universities in evaluating if such approaches are beneficial or not. A holistic approach to wellness may be too overwhelming and cause undue pressure as opposed to lowering levels of stress and depression. The current research shed light on the advantage, or lack thereof, of such holistic approaches.

**Purpose and Significance of the Study**

The purpose of the current study was to evaluate if stress and depression levels can be predicted based on level of student involvement. The researcher hypothesized that participation in a holistic healthy living program or being a part of intercollegiate athletics would significantly contribute to the model of predicting stress and depression levels of undergraduate students. The
benefits of individualized student programs have shown great benefits to student success. These programs include but are not limited to religious support (Duffy & Lent, 2008; Maton, 1989), developing healthy study habits (Pauk & Owens, 2004), eating habits (Brunt & Zhong, 2008; Desai, Miller, Staples, & Bravender, 2008), exercise programs (Desai et al., 2008; Miller & Divin, 2008), and drug awareness (Green, Uryasz, Petr, & Bray, 2001). These programs have all been shown to greatly reduce the amount of stress and depression experienced by individuals, thus allowing them to reach their goals while retaining at the institution (Astin, 1974).

This study will hopefully fill the literature gap in regards to holistic healthy living facilities on college campuses. It also analyzed the potential similarity between these residents and the student athlete. Both have copious amount of resources at their disposal and it was of interests to see if the two student environments could be correlated. As was discussed earlier in this chapter, the research conducted herein is important due to the rising stress/depression levels reported by students nationwide (NIMH, 2007). Answers need to be found in regards to how institutions of higher learning can decrease these statistics and assist students in reaching their full potential.

This research study evaluated a comprehensive wellness program designed by a co-educational institution located in the southeastern region of the United States. The program is a comprehensive healthy living/learning opportunity for on-campus residents. The program fosters positive decision making and assist students by educating them on healthy alternatives. The data analyzed was pre-existing and was gathered by the researcher in 2009. All healthy living residents and student athletes were given a Health Risk Appraisal survey at the end of the 2008-2009 academic year. Also, the entire student body was given the survey during the same
semester. The current research examined the results of the survey, evaluated the two scales of depression and stress. The study responded to the following research questions:

1. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of stress in undergraduate students attending a four-year institution?
2. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of depression in undergraduate students attending a four-year institution?

These questions were answered by running two multiple regression models in finding the best predictors for the two dependent variables (stress and depression). The stress scores were summed to obtain an overall score for analysis purposes, as was the depression scores.

In answering the above questions, the researcher hypothesized the following outcomes. In evaluation of the demographic variables, females would report significantly higher stress and depression scores than males (Hudd et al., 2000). Also, due the transition from high school to college, freshmen would report significantly higher stress and depression levels than upperclassman (D’Zurilla & Sheedy, 1991; Pritchard, Milligan, Elgin, Rush, & Shea, 2007; Towbes & Cohen, 1996). Furthermore, the analysis would likely concur with past research findings and show that minorities would report higher levels of stress and depression when compared to their majority peers (Greer & Chwalisz, 2007; Kingsbury, 2011). When delving into the three groups (healthy living residents, student athletes, and the general student population) it was hypothesized that the healthy living residents and student athletes would significantly contribute to the model in predicting stress and depression levels of undergraduate students.
Organization of the Dissertation

The current chapter has introduced the consequences associated with depression and stress in today’s college student, given the purpose and significance of this research study, and provided an overview of the methodology, along with the research questions and proposed hypotheses. The following chapter will give an in-depth review of the literature surrounding the topic of stress and depression and discuss student development theory as it relates to the college-aged student. Chapter three, methodology, will discuss the research design, sample selection, data collection and data analysis methods. The fourth chapter will present the results of the study. The final chapter, chapter 5, will discuss the results, how these findings can be used in practice and suggestions for further research on the topic.

The study hopefully will fill a gap in the literature related to holistic approaches to student development, the more information that is available in assisting academic and student affairs in curtailing some of the stress faced by all levels of students, the better. Also, it is the hopes of the researcher that the following study will assist the university being evaluated in the improvement of their newly designed program.
CHAPTER 2
LITERATURE REVIEW

Involvement provides a common objective on which everybody at the institution can focus. We are engaged in competition with other life forces the student confronts, including family, job, and so forth. To a certain extent, we want to prevail in that competition, to have a piece of that student’s energy. (Richmond, 1986, p. 92)

The following review examined the value of student involvement and the positive impact it can have on student success (Astin, 1993). The literature indicates that student involvement has been shown to help reduce stress and depression levels in college students; this will be discussed in depth (Britz & Pappas, 2010; Broughman, Zail, Mendoza, & Miller, 2009; Cohen, 1992; Cohen, 2004; Cohen, Kessler, & Gordon, 1997; D’Zurilla & Sheedy, 1991; Economos, Hildebrandt, & Hyatt, 2008; Friedlander, Reid, Shupak, & Cribbie, 2007). The history of stress and depression in higher education will be evaluated, while examining the creation of counseling centers within the college and university setting to help alleviate these issues. The work of Alexander Astin will be reviewed at length. Astin’s student involvement theory (1984) is a well-respected work in the field of higher education. Astin’s theory involves three simple components: inputs, environment, and outcomes. The current research will focus mainly on the environmental component and how this impacts student success as it relates to the emotions experienced while in college; mainly stress and depression. Many approaches to wellness have
been created throughout the years including, but not limited to, spiritual development, time management skills, healthy eating, exercise programs, peer support, drug and alcohol awareness, and development of study habits (Braskamp, 2007; Britton & Tesser, 1991; Britz & Pappas, 2010; Cohen, 1992; Finn, 1996). These programs are established to hopefully assist in alleviating some of the stressors college students experience and in so doing helping them develop academically, socially, and emotionally. These specific approaches to student wellness will be discussed, most of which were developed using Astin’s research as a conceptual framework (Braskamp, 2007; Britton & Tesser, 1991; Britz & Pappas, 2010; Cohen, 1992; Finn, 1996). A conceptual framework, designed by the researcher, for the current research will be examined which combines all of the above methods into one holistic approach while referring back to Astin’s theory of student involvement. This study hopes to demonstrate the importance of a holistic approach to wellness through the establishment of healthy living residence halls.

The transition from high school to an institution of higher learning can be an extremely stressful event in a young person’s life (Towbes & Cohen, 1996). As a student progresses through their academic journey stressful situations are inevitable (Hudd et al., 2000). The lack of resources available to assist students in their transition can cause undue stress, which can lead to poor academic performance, relationship difficulties, and deficient health, to name a few (Britz & Pappas, 2010). Ninety-eight percent of students report experiencing some form of stress within their past year of college (National College Health Assessment [NCHA], 2011). This large percentage implies that there is a relationship between college and stress. As a consequence, if these stressors are not addressed properly they can progress into a depressive disorder (Kisch, Leino, & Silverman, 2000). Many students deal with depression on a daily basis, with 18.8% of students being clinically diagnosed with depression. This statistic is
concerning due to the prevalence of suicide attempts of individuals between the ages of 15 and 24 years of age (American Foundation for Suicide Prevention, 2012). Institutions are finding that, through the development of intervention and prevention programs, they can assist in reducing the prevalence of these symptoms and potential outcomes associated with stress and depression (Jed Foundation, 2007; Knott, 1973).

**Development of the University Counseling Center**

Stress, whether it is related to academics, career, relationships, finances, or normal daily stressors, is experienced by most individuals (Hewitt, & Dyck, 1986). In the early years of higher education faculty and administrators began seeing that students were dealing with these types of issues (Association for University and College Counseling Center Directors [AUCCCD], 2005). In order to assist students in their concerns, college and university administrators created university counseling centers to assist these students. In creating these centers, administrators, faculty, and staff did not foresee the benefits they could have on assisting student success. Rather, they saw only the issue as an emotional concern and, therefore, left it to the professionals in the field of counseling (AUCCCD, 2005).

The history surrounding counseling centers in higher education dates back to the mid 1940’s. The Second World War ended in 1945 and, with the considerable number of veterans returning from war under benefits provided to them by the Servicemen’s Readjustment Act of 1944 (otherwise known as the G.I. Bill), colleges and universities saw a massive surge in enrollment (Altschuler & Blumin, 2009). According to Altschuler and Blumin (2009) these veterans were given full tuition and all expenses paid toward the completion of a college degree. Furthermore, they were given one year’s worth of unemployment compensation which allowed them the chance to get their finances in order. However, this was a new breed of student.
Colleges and universities were not prepared to handle the emotional needs of these former soldiers. These veterans had witnessed things that civilian students could never comprehend. These institutions quickly realized they needed professionals on campus to adequately assist these veteran students in achieving their goal of obtaining a college degree and, thus, began the first college counseling center (Altschuler & Blumin, 2009). The movement spread quickly, and in the early 1950’s the Association for University and College Counseling Center Directors emerged (Gallagher, 2011). These Directors would meet annually to discuss how best to reach students and help with their emotional and mental needs. Currently this organization has a membership of 677 universities and colleges throughout the United States, Canada, Europe, and Asia (AUCCCD, 2005).

The above mentioned association conducts a National Survey of Counseling Center Directors annually (Gallagher, 2011). The findings from the 2011 administration reported that 87 students in the United States had committed suicide with only 20% of those ever visiting a counseling center. That equates to 70 students who never reached out to the counseling center for help. Of the students who had obtained assistance, the primary risk factor associated with their suicide was depression with 76% of the students experiencing some level of depression. The second leading risk factor at 46% concerned relationship issues. These statistics are cause for concern due to depression and relationship issues being reported by students as two of the three most common reasons for visiting these centers; depression leads with 37.5%, while anxiety is slightly less at 36.8%, with relationship issues coming in a close third with 35.9% of the reported cases. Given the above statistics, it is important to recognize the warning signs associated with depression and suicide and ensure that resources are in place to identify the students in need of assistance and that the proper programs are in place to meet their needs.
Counseling services on college campuses, while valid, need to work in conjunction with other areas on campus to combat stress, anxiety, and depression in college students. Student affairs personnel, faculty, staff and administrators need to be aware of ways they can assist these individuals in reducing their symptoms associated with their disorder (Friedlander, Reid, Shupak, & Cribbie, 2007). The stigma associated with receiving counseling from a licensed counselor may be off-putting to the student and thus keep them from getting treatment (Hunt & Eisenberg, 2010). Furthermore, Hunt and Eisenberg found that many believe counseling will not work for them or they may not believe they are in need of help. The National Center for Health Assessment (2011) found that only 24% of individuals diagnosed with depression were receiving treatment. Hunt and Eisenberg’s research (2010) utilizing the Healthy Minds Survey also found that less than half of the students exhibiting major depressive and anxiety disorders had received any assistance within the last year. Based on these findings, it seems clear that others on campus, aside from the counseling center, need to be educated in assisting these individuals and proper resources and programs need to be in place to help them become successful (Hunt & Eisenberg, 2010). This collaboration may lead to increased academic performance, higher retention percentages, and improve the student’s overall well-being (Astin, 1984). These establishments are seeing their contribution in shaping individuals in a holistic way.

The Modern University

The concept of higher education as a solely academic environment is outdated in the mission of current institutions. The current mission of most colleges’ state, with distinction, that helping to mold individuals not only intellectually but developmentally is important to their role, scope and mission (Scott, 2006). These institutions are developing a variety of new programs that can encourage growth in a number of areas including, but not limited to, religious support
(Duffy & Lent, 2008; Maton, 1989), developing healthy study habits (Pauk & Owens, 2004), eating habits (Brun & Zhong, 2008; Desai, Miller, Staples, & Bravender, 2008), exercise programs (Desai et al., 2008; Miller & Divin, 2008), and drug awareness (Green, Uryasz, Petr, & Bray, 2001). The programs listed, among others; focus on reducing stress so that students can perform to their upmost potential. This research would like to investigate not one area of development, specifically, but a holistic approach to wellness with an outcome of reduced stress and depression levels in college students. Research regarding holistic programs is sparse, and it is the hopes that this research will fill that need and demonstrate that this approach is beneficial. The conceptual framework, detailed later, states that if these resources are put into place those students who embrace them will have lower stress and depression levels when compared to those who do not. This holistic approach to student involvement should correlate with Astin’s finding in that the involvement of these students and the relationships made will equip them with better coping strategies for stress when compared to their non-involved peers (Astin, 1974).

**Astin’s Theory of Student Involvement**

As college students are thrust into unfamiliar surroundings there is a strong possibility they will experience stress. Students enrolled in institutions of higher learning often state that they are under a tremendous amount of stress (Economos, Hildebrandt, & Hyatt, 2008; Larson, 2006). As they are introduced to this new environment they are inundated with unfamiliar classroom settings, the need to make new friends, academic expectations, and living on their own for the first time. These stressors can impact their academic success as well as their development as a person (Economos, Hildebrandt, & Hyatt, 2008; Larson, 2006).

Astin (1993) has found through his research that student involvement positively impacts many developmental outcomes. Astin defines student involvement as the “amount of physical
and psychological time and energy the student invests in the educational process” (Astin, 1999, p. 6). He derives his theory from the work of Sigmund Freud and his concept of ‘cathexis.’ Freud’s definition of cathexis is the process of investment of mental or emotional energy in a person, object, or idea (Hall, 1954). Freud’s notion of cathexis is strongly related to the concept of ‘time on task’ which simply states the more time spent on academic endeavors the more successful the student will be (Carroll, 1963). Astin’s theory of student involvement and the positive impact it has on student development stems from both of these concepts (Astin, 1984). However, Astin quickly found that his findings may be due to input variables not originally considered. He theorized that students were entering the institution with characteristics that may impact their environment while attending college and the outcomes upon graduation (see figure 2.1). These input measures include demographic variables, student background information, and previous experiences (Astin, 1985). Astin felt it was important to control for these 150 student input variables and did so through regression modeling. Secondly, he felt that the students’ experiences while attending college were important in predicting the outcome as well. He labeled this environment and defined it as their level of involvement with peers, academics, and social activities while enrolled in college. The inputs and environments will be the determinants, according to Astin, of the student’s outcomes upon graduation. These outcomes include their attributes, knowledge, attitudes, beliefs, values, and overall wellbeing (Astin, 1970).
Figure 2.1. Astin’s Input Environmental Outcome (I-E-O) Model (National Study of Living Learning Program, 2012).

Astin has found through the development of his theory that student involvement is directly correlated with student success in a multitude of areas: retention, graduating with honors, enrolling in graduate school, increases in standardized test scores, and all self-reported increases in cognitive and affective skills. This study focused on these affective skills of students in handling the transition and stressors related to their education journey. Furthermore, he found these skills to be greatly enhanced with students who lived on campus and/or developed a strong peer group.

Astin’s (1975) longitudinal research spanned four-years and found that “the factors that contributed to the student’s remaining in college suggested involvement, whereas those that contributed to the student’s dropping out implied a lack of involvement” (Astin, 1999, p. 523). According to Astin (1999) one of the most significant predictor to improving students’ affective skills was residing in an on-campus residence hall. One of the most interesting findings associated with residing on-campus was the positive impact on student success regardless of the student’s gender, ethnicity, aptitude, or personal upbringing (Astin, 1973; Astin, 1977; Astin, 1982). The research of Chickering (1974) and Tinto (1975; 1993) concur with Astin’s findings in
regards to residing on-campus and its positive correlation to student development. Astin’s supposed that this success is strongly due to the student involvement of on-campus residents in that these student are “eating, sleeping, and spending their waking hours on the college campus” (Astin, 1999, p. 523). Students living on-campus find an identity and attachment to their institution and are thus more likely to devote more time to their studies and retain. On-campus residents also demonstrate increases in the areas of artistic awareness, broad-mindedness, and interpersonal self-worth when compared to commuter students. Furthermore, these residents have reported increased collaboration with faculty members, participation in student organizations, and Greek societies (Astin, 1999). The increased involvement intensifies their satisfaction in the overall undergraduate experience, particularly in the areas of student relationships, interaction with faculty and staff, institutional status, and their social life (Astin, 1999). All of these areas, when perceived as going well by the student, have shown to decrease stress and depression levels of undergraduate students (Britz & Pappas, 2010; Cohen, 2004; Cohen & Wills, 1985; D’Zurilla & Sheedy, 1991; Friedlander, Reid, Shupak, & Cribbie, 2007; Garlow et al., 2008; Graunke & Woosley, 2005; Hammen & Cochran, 1981; Jy, 2010; Kisch, Leino, & Silverman, 2000; Mahoney, Caims, & Farmer, 2003; Ross, Niebling, & Heckert, 1999; Stevens, Loudon, Yow, Humphrey, & Bowden, 2013; Swenson, Nordstrom, & Hiester, 2008; Towbes & Cohen, 1996; Wilcox, Winn, & Fyvie-Gauld, 2006; Zhao & Kuh, 2004). A negative find associated with on-campus living states that students who live on campus are much more likely than their commuter peers to become more hedonistic and less religious than when they started college (Astin, 1984).

Astin’s findings concerning the benefits of living on campus are closely related to another significant predictor of student development; the peer group. Astin states that, “the single
most powerful source of influence on the undergraduate student’s academic and personal
development is the peer group” (Astin, 1993, p. 8). The measures used to evaluate student
interactions were vast including the following academic items: reviewing course content,
completing team assignments, student tutoring, etc. Furthermore, the following social
involvement variables were evaluated as well: becoming a part of an intramural team, joining a
Greek organization, student government, and amount of time devoted to registered student
organizations. Participation in these various academic and social programs have shown to have
positive benefits in a multitude of student development areas. Astin (1993) found peer
involvement to greatly benefit students in the areas of development of leadership skills, general
academic development, and increased problems solving and critical thinking skills, as well as a
self-reported increase of overall cultural awareness and positive self-concept. Additionally, the
establishment of a peer group has shown to result in decreased depression levels reported by
students, as well as an increase in believing they can make a change in society (Astin, 1993).
Astin’s evaluation of these environmental factors while attending college were found to be
heavily influenced by the input variables of these students, mainly related to gender and race.

Astin found that females and males differ in a multitude of areas before they even begin
college. Therefore, these differences must be controlled for when establishing the effectiveness
of involvement while attending college. The greatest contrast of gender, according to Astin
(1993), was in the area of psychological welfare. He states that women come into the university
with a higher proclivity to stress and depression when compared to males. This was found to
continue throughout the undergraduate years with women reporting higher levels of depression,
feeling overwhelmed, and lower self-reported emotional health scores than men. The research
findings indicate that women are drawn to peer groups containing women and men to men.
Given all of the results indicating the positive effects of peer relationships, it is important to note that the peer group as a whole has a great deal of influence on the establishment of values and beliefs of its members. Therefore, it is important for a student to surround themselves with individuals who are a positive influence on their development (Astin, 1993). Similar findings were found in regards to racial differences.

Astin (1993) found racial differences between white and black students in regards to the peer group. Interestingly, it was concluded that instead of becoming more like minded in political issues these students actual grew farther apart in their beliefs associated with racial concerns. Astin concludes that this is due to the deliberate segregation of these groups, indicating that blacks tend to seek out black student organizations and groups, as do whites within their own race. Astin states that higher education contributes to the segregation of these groups in the establishment of predominately black or white colleges and the development of registered student organizations targeted toward one specific group of people. However, he states that attempting to desegregate these groups will only succeed if there is a representative sample of individuals representing each group. Furthermore, the joining of a student organization is voluntary and the student is most likely going to choose the peer group in which they feel most connected which is most likely their same gender and/or race (Astin, 1993).

Although, student involvement has its obvious advantage in determining student success and development, Astin (1999) states that too much involvement may have negative effects. He states, “…there are probably limits beyond which increasing involvement ceases to produce desirable results and can even become counterproductive” (Astin, 1999, p. 528). This finding is important to the current study because the program being analyzed is very intense. Astin’s discovery of a diminishing marginal return as it relates to too much student involvement may
indicate that the program being analyzed may have limits beyond producing successful outcomes for the students. The perceived benefit of a student involvement program may be weakened as increased number of hours are spent working within that program.

**Defining Stress**

Stress has been defined many ways. However, the underlying physical and emotional strain it places on the body is the common thread expressed by many prominent researchers in the field. Hans Selye (1956) discusses a process entitled general adaptation syndrome, in his book *The Stress of Life*. The process contains three stages in which individuals can react to stressful events. The alarm phase is the body’s initial reaction to stress in which hormones surge and energy is given to handle the event. The alarm phase contains two stages: shock phase and the antishock phase. The shock phase is where the body completely shuts down. There is no resistance in place to handle the stressor and the individual will experience some level of shock. The antishock phase allows the body to respond in a healthier way to the stressor (Selye, 1956). Adrenaline may be elevated, along with increased blood pressure and an apparent surge of cortisol, which is the stress hormone. If the stressful event continues the individual goes into the resistance stage in which the body’s resources in handling the event begin to rapidly deplete. The body cannot stay in this stage for long, there must be some means of coping with the stressful event, if no such means are achieved the body goes into exhaustion and reverts back to the shock phase and completely shuts down due to chronic stress. Selye states that if the individual reaches this level of shock due to chronic stress, death may occur. If a coping mechanism is found then the body goes into recovery mode in that the resources produced by the body have successfully overpowered the stressor and the body begins to regain its original healthy state.
Stress can be experienced in a variety of ways. The above mentioned stages could apply to a car crash victim or an individual dealing with a great deal of pain every day of their life. The intensity experienced by the stressful event depends on the individual’s ability to handle the stress both mentally and physically and the extent of the demand made upon the body and the resources available to cope both internally and externally (Seyle, 1956).

**Eustress vs. distress.**

Although there is no universally accepted definition of stress, Selye’s (1956) description is widely accepted. He defines stress as “the nonspecific response of the body to any demand made upon it,” which relates to both eustress (good stress) and distress (bad stress) (Selye, 1973, p. 692). In higher education eustress can be in the form of accepting a challenge and completing it with a sense of accomplishment (Robotham & Juliam, 2006). This type of stress is handled in a healthy way by analyzing the situation and taking control (Seyle, 1976). The individual feels the pressure in getting the situation reconciled but takes the appropriate steps to ensure it is completed and done well. Upon completion they feel relief and self-satisfaction; they take the experience in moving forward in their lives, knowing that they can deal with future stressful situations in a healthier way. For example, a speech, school project, or a mid-term exam can all be stressful situations in the life of a college student, but if handled properly the student can feel a huge sense of accomplishment by preparing and completing the task at hand (Robotham & Julian, 2006). However, if the stressful situation is not dealt with in a healthy way the individual experiences a form of distress. In contrast, distress can lead to anxiety, depression, anger, fear, and an overall negative view (Seyle, 1976). This in turn can lead to procrastination and an overall sense that the task cannot be completed due to time constraints or a perception that they lack the skills necessary to succeed. If a student gets into a pattern of handling stressful situations
in this manner it can affect many areas of their life including, but not limited to, grades, health concerns, relationship issues, and alcohol and drug problems (Towbes & Cohen, 1996). Walter Cannon (1932) researched how individuals initially approach a stressful situation and what occurs physically and mentally as they resolve internally how the event should be handled.

**Fight or flight.**

Selye’s 1956 work was based on the research of Walter Cannon (1932) who coined the “flight or fight” response to stressful situations. This process states that when faced with stressful events the body’s reaction is to stay and face it head on or to turn and flee. The body begins increasing certain functions for increased energy including hormone levels, heart rate, and breathing to name a few. Even though the flight or fight responses have been established, they are not always chosen. Simeons (1961) explains that in current times a flight or fight response may not be appropriate in some situations. For example, if a superior affronts a subordinate in a meeting it is not appropriate to fight the supervisor or to get up and leave. Most subordinates would continue sitting there with all of the internal indications occurring. The same can be said for a confrontation within a class room. It may not be appropriate or professional to engage the individual in discussion or respectful to leave the classroom. Therefore, the individual experiencing the stressful situation must just sit there and internally deal with the event. Simeons (1961) states that although it may be appropriate it is not advantageous to our bodies. By internalizing these emotions one can begin to develop chronic stress, as was discussed above, which can lead to major health issues including death.

Another distinguished researcher in the field, Cohen, defines stress as a process in which “environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease” (Cohen,
Kessler, & Gordon, 1997, p. 3). Although the majority of Cohen’s focus is on the physiological outcomes of stress, he does discuss the emotional and social consequences as well. Multiple stressful situations increase the demands upon the person, thus increasing the possibility for biological, physiological and mental vulnerability. Stress is not only the circumstances individuals’ encounter, but how they interpret the situation and how well they believe they are equipped to handle it is also important in coping with stress (Cohen et al., 1997). The transition from high school to college involves many new situations of which young adults have little to no experience. The stressors faced by these individuals can determine their success in college and ultimately influence the progress of their development as they advance through college (Astin, 1984).

**Stress as it Relates to College Students**

The stressors faced by college students are numerous with the self-reported occurrence of stress revealing alarming figures, according to a National Health Assessment Survey (2011). However, four broad categories of stress faced by college students have been established by Greenberg (2009). These categories include achieving emotional independence from family, choosing and preparing for a career, preparing for emotional commitment and family life, and developing an ethical system (Greenberg, 2009). Within each of these are innumerable stressors faced daily by students on college campuses. The National College Health Assessment (NCHA) results for spring 2011 concur with Greenberg’s classifications. In the spring of 2011, 129 schools self-selected to participate in this survey (N = 105,781). When surveyed 98.1% of the students sampled stated they had experienced stress in the past year, with 53.1% suffering from more than average or tremendous amounts of stress. Of these students many stated that within the past year they had difficulty handling their academic responsibilities (45.1%), family
problems (26.9%), career (25.3%), and intimate relationships (32.2%). Furthermore, they had difficulty dealing with finances (34.1%), sleep patterns (25.4%), and appearance (21.8%) (NCHA, 2011).

How one views the self can be a major area of strain. In today’s society individuals’ perception of how they look may determine how they feel about themselves (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). Even though only 34.4% of the sample stated they were overweight, 51.8% were trying to lose weight (NCHA, 2011). This statistic is noteworthy because it assumes that these individuals do not perceive themselves as overweight but are still trying to reach a level of unrealistic thinness that is often portrayed in the media. Park (2005) states that the influence of mass media, mainly fashion and beauty magazines read by college students, has a significant influence on their desire to be thin. Furthermore, the researcher found that the social pressure from fellow students has a significant impact as well. These students see themselves as bigger than they are and compare and contrast their bodies to others (Nelson et al., 2008). The struggle within college to be thin and attractive can overtake the lives of these students and can hinder their academic success.

Trying to fit into a new environment with these physical and social pressures while trying to succeed academically can sometimes be too much for an individual to handle. These statistics get even more significant as research examines the effects these stressors can have on an individual if not handled properly. If the proper assistance isn’t in place then these stressors, as explained earlier, can manifest into a depressive disorder.

**Defining Depression**

If not handled properly, these stressors can manifest into a destructive condition known as depression (Nezu, Nezu, McClure, & Zwick, 2002). According to the Diagnostic and
Statistical Manual of Mental Disorders (DSM-5, 2013) the criteria for major depressive disorder includes depressed mood or a loss of interest or pleasure in daily activities for more than two weeks, mood represents a change from the person’s baseline, and impaired function socially, occupationally, and/or educationally. Furthermore, there are nine specific symptoms of depression. If an individual has experienced five of the nine symptoms, present nearly every day, within the two week period, they are then diagnosed with major depressive disorder. The nine symptoms are listed as such:

- depressed mood or irritable, nearly every day during most of the day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful);
- marked diminished interest or pleasure in almost all activities, most of each day;
- significant weight change (5%), or a change in appetite;
- insomnia or hypersomnia (excess sleep);
- psychomotor agitation or psychomotor retardation;
- fatigue or loss of energy;
- feelings of worthlessness or inappropriate guilt;
- impaired ability to concentrate or indecisiveness; and
- thoughts of death or suicide, or has suicide plan (DSM-5, 2013, p. 296.21(F32.0)).

The recent changes to the DSM (2013) have proposed anxiety symptoms that may indicate depression. These include irrational worry, preoccupation with unpleasant worries, trouble relaxing, feeling tense, and/or fear that something awful might happen. Major depressive disorder has two levels, moderately or severely impaired, as it relates to various functional domains. When evaluating school and academic work the DSM defines a moderately impaired
diagnosis as one in which grade performance is deteriorating, classes are being cut or missed, decreased effort in academic and social areas, and a moderate level of academic stress. The severely impaired has the following criteria, failing grades, missing school, does not care much what happens academically, oppositional, argumentative, and exhibits high academic stress (DSM-5, 2013, p 296.21(F32.0)).

The National Survey on Drug Use and Health (2012) found that the prevalence of depression in the United States has increased from 6.4% in 2008 to 9.1% in 2011, with 235,067 meeting the above criteria for depression. Of the individuals surveyed 4.1% met the criteria for major depression (meeting more of the symptoms listed above). The greatest increase of depression when regional comparisons were made was found in the southeast, this is important to this study because the respondents used are from the southeastern region of the United States. Further research supports this finding. The Centers for Disease Control and Prevention (2012) found that the southern region of the United States had the largest depression rates. The state in which the university being researched resides had a 13% prevalence rate of depression, which is notable since the state with the highest level of depression was 14%. One explanation of the higher rates correlate with the high rates of obesity, stroke, heart disease, and sleep disorders reported from the southern region as well. Reviewing the data demographically it is found that women are twice as likely to experience depression when compared to males (The National Institute of Mental Health [NIMH], 2007). The differences may be due to females’ desire for acceptance and perfection. This is important to this study because, currently, the ratio of females to males is 1.75:1 in the institution being studied. Of the individuals, both male and female, who experience depression only half of them will seek help from a counseling center or doctor (Association for University and College Counseling Directors [AUCCCD], 2005). Therefore, the
prevalence of depression reported above may be underrepresented. The increase of depression in the U.S. and the desire to fit in while being ‘perfect’ both socially and academically can have an increased strain on a students’ ability to develop properly (Garlow et al., 2008). The need to be perfect coupled with the stress associated with college can be detrimental to the development of individuals in higher education if the proper channels are not in place to curtail the negative consequences associated with each (Rice & Dellwo, 2002).

Perfectionism, Stress, and Depression of College Students

Hewitt and Dyck (1986) found the link between perfectionism, stress and depression. They distributed a survey to college students and found that the respondents who scored above the mean on the perfectionism scale demonstrated a positive relationship with stress and depression. Furthermore, much research has concurred with these results to indicate that the perfectionism desired by college students results in various negative consequences (Halgren & Leahy, 1989; Rice & Dellwo, 2002; Vieth & Trull, 1999). The National College Health Assessment (2001) found that 15.3% of the students sampled had felt so depressed within the past month that it was difficult to function. Of the students sampled 18.8% had been formally diagnosed with depression with 10.7% of that being within the past year. Furthermore, 5% disclosed that they had intentionally hurt themselves within the past year with 19.3% stating they had seriously considered suicide during their lifetime (7.5% attempting). The percentage of suicide attempts is cause for concern. In 2002, 30,000 Americans committed suicide, and the numbers are underreported due to suicide being recorded as an accidental death in some instances (Bellinir, 2002). Ten percent of the suicides in 2009 were people between the ages of 15-24 years of age (American Foundation for Suicide Prevention, 2012). Men are four times more likely than females to commit suicide, while females have more attempted suicides than
men; more men succeed in their attempts (Bellinir, 2002). The amount of involvement currently on college campus’ to intervene and assist students seems to be lacking when you look at the above figures. The establishment of a healthy living community that focuses on health related issues including emotional, physical, and over all well-being may be what students need to get through these difficult times. Social support and involvement in college has shown to drastically reduce the amount of stress experienced by college students, thus decreasing the likelihood of it progressing to chronic stress or depression (Cohen, 1992; Cohen, 2004; Cohen, Gottlieb, & Underwood, 2000; Cohen & Wills, 1985; Friedlander, Reid, Shupak, & Cribbie, 2007; Huang & Chang, 2004; Jy, 2010).

The Benefits of Student Involvement

The beneficial influence of student involvement and support on retention has been established (Astin, 1977; Bean, 1980; Spady, 1971; Tinto, 1993). Tinto argued that students who are involved in academic and non-academic programs felt more connected to the institution and were more likely to progress to graduation than those who were not involved in these programs. The Student Integration Model, developed by Tinto, argues that students who tend to drop-out are those who have not invested themselves into the institution. As students participate in social activities they develop a group of peers in which they feel comfortable. They become invested in the institution through their peers and are less likely to leave. Furthermore, these students who are involved in external social and academic programs report higher satisfaction; with social integration being the most significant factor of student satisfaction (Liu, R. & Liu E., 2000). Additionally, the issue of academic improvement as social involvement increases has been discussed, with Zhao and Kuh (2004) finding that students who participate in a community of peers actually exhibited higher grades than those who did not. This can be further supported by
Huang and Chang (2004) who found a positive correlation between academic success and social involvement. The students who were involved also had developed a peer group in which they felt comfortable discussing issues and stressors (Huang & Chang, 2004). Colleges across the nation are developing techniques to assist students in coping with the stressors associated with the transition to higher education. A few of these techniques communicate the importance of student life involvement, helping students get physically active, assisting in the development of healthy relationships, spiritual development, and developing time management skills (Koff & Bauman, 1997; Love & Talbot, 1999; Macan, Shahani, Robert, & Phillips, 1990; Miller & Divin, 2008; Swenson, Nordstrom, & Hiester, 2008). These can be stand-alone programs or all-inclusive programs that are being developed to assist students in a multitude of areas. These programs help students assimilate into the larger campus environment while keeping them focused (Mahoney, Caims, & Farmer, 2003). Stress eventually can become lessened because they have a support group of students who have experienced some of the same issues (Cohen, 2004; Cohen, Gottlieb, & Underwood, 2000; Cohen, Kessler, & Gordon, 1997; Cohen & Wills, 1985).

**Student involvement and stress.**

Individuals with good social support systems are less prone to stress than those that lack these resources, with the latter becoming more susceptible to anxiety and depression (Cohen, 1992; Cohen, 2004; Cohen & Wills, 1985). Furthermore, social networks which reduce stress levels may assist in preventing undesirable consequences such as poor grades or drop-outs. Schlossberg (1989) found that students who feel a sense of mattering, having other individuals being interested in their future and having someone to depend on, was a factor in reducing stress levels for incoming freshmen students. The social support system was the most significant predictor of mattering for college freshmen (Schlossberg, 1989). Furthermore, social support, as
well as perceived self-esteem, was negatively correlated with stress levels. Meaning, as social support and self-esteem perception decreased, stress levels increased in undergraduate students (Jy, 2010). As social support and wellness programs are put into place, these students’ self-esteem perceptions will increase as well. As self-esteem increases and stress levels decrease, students will show academic improvements as well as positive modifications to the social and emotional aspects of their lives. As these improvements are made, their likelihood of becoming depressed decreases as well (Friedlander, Reid, Shupak, & Cribbie, 2007). The establishment of social support can be found in many individualized programs on college campuses. One such program involves wellness, in which a student is placed in a peer group that aspires to establish healthy living habits, and this program in itself has multiple benefits.

*The benefits of a healthy lifestyle.*

Wellness programs on college campuses:

- offer certain advantages over exercise and sport activities such as consciously promoting the integration of emotional health and well-being with improved physical functioning by focusing simultaneously on improving fitness, promoting healthy nutritional habits, and developing effective stress management techniques” (Koff & Bauman, 1997, p. 555).

These programs have shown that students who participate have increases in self-esteem levels (Friedlander, Reid, Shupak, & Cribbie, 2007). They also demonstrate greater social interaction when compared to those who did not participate in the wellness program (Hsieh, 2011; Koff & Bauman, 1997; Miller & Divin, 2008). Furthermore, they made better lifestyle choices once they completed the 6-week program. Of the characteristics of a wellness program the emotional education seems to be the most beneficial. The effects of stress, as stated earlier, are numerous. However, according Britz and Pappas (2010), students who do not know how to properly
manage their stress exhibit increases in unhealthy eating habits, sleeping habits, and reduced exercise, which in turn can lead to more stress.

Students who reported inconsistent sleeping habits and unhealthy dietary habits exhibited higher levels of stress when compared to their peers. The students who reported getting seven or more hours of sleep at night reported lower levels of stress than those sleeping less. Also, the respondents who demonstrated healthy eating habits such as eating breakfast and meeting their recommended daily requirements of fruits and vegetables, reported lower stress levels than those with poor eating habits (Britz & Pappas, 2010). The benefits of healthy dietary and sleep habits are important; however, the significance of physical activity as it relates to stress reduction is a vital component of success as well. The effects of physical activity on stress levels has shown to be a stress reducer (Hsieh, 2011). As individuals become healthier their self-esteem improves and as these adjustments are made the individual will have better emotional, social, and academic success (Friedlander, Reid, Shupak, & Cribbie, 2007). Interestingly enough some individuals who are experiencing a stressful event do not have to necessarily receive support to lessen the stress but only needs to know it is available (Cohen, Gottlieb, & Underwood, 2000). This has major implications in the higher education field. As long as resources are available to students, regardless of whether they are utilized, it could assist in easing the transition from high school to college life. These findings indicate that educating students, on the benefits of exercise, healthy eating, and recommending various coping strategies to deal with stress, assist in their overall well-being which will increase their success both academically and socially (Cohen, Gottlieb, & Underwood, 2000). As is evidenced by the potential outcomes of these stressful situations it is imperative for colleges and universities to be aware of the issues college students are confronted with daily and to have the proper channels available to assist their needs. The
significance of reaching these students early is imperative to their progression and success (Swenson, Nordstrom, & Hiester, 2008). The mere establishment of a support group could be the main contributor of student success regardless of the program’s focus. (Cohen, Gottlieb, & Underwood, 2000). Allowing students to be a part of something may have more of a benefit than the program itself. The development of these relationships has shown to have a great impact on student success.

**The benefits of establishing healthy relationships.**

The peer, as well as staff and faculty relationships are positively correlated with student development as the transition from high school to college occurs (Astin, 1993; Chickering & Reisser, 1993). These students are able to develop competence, learn to manage emotions, and develop mature interpersonal relationships through their involvement with other students, staff, and faculty (Chickering, 1994). “The clear weight of evidence indicates that such interactions have important impacts on student personal and intellectual growth during college” (Pascarella, 2006, p. 513). The importance of establishing strong relationships during the first year of college is crucial to the success of the student (Cohen, 2004). The students with strong relationships adjust better to their new environment and find a connection to the institution (Astin, 1984). However, it is important to point out that although high school friendships that transfer into college are important initially, the formation of new friendships is vital (Swenson, Nordstrom, & Hiester, 2008). Students who do not develop new friendships find the transition to college life difficult as well as completing their academic obligations (Friedlander, Reid, Shupak, & Cribbie, 2007). However, the importance of social interaction and development of peer relationships is not limited to freshmen students (Graunke & Woosley, 2005; Kisch, Leino, & Silverman, 2000; Towbes & Cohen, 1996). The need for programs and faculty interaction at various levels of a
student’s academic career is crucial to their development and progression. Many institutions put their resources into freshmen students, particularly incoming freshmen, and the students making the transition from freshman to sophomore get lost in the shuffle (Graunke & Woosley, 2005). Although the transition from high school to college is an enormous adjustment, the second year can be just as challenging. These students are deciding on their future vocation and developing goals. Sophomores may feel that much attention was given to them initially and now are isolated in their endeavors (Graunke & Woosley, 2005). Therefore, it is important to evaluate the students at each level to understand their needs and stresses at that particular time (Kisch, Leino, & Silverman, 2000). The establishment of resources for all levels of students has shown to reduce stress levels and increase the satisfaction with the institution as a whole (Cohen, 2004; Cohen, Gottlieb, & Underwood, 2000; Cohen, Kessler, & Gordon, 1997; Cohen & Wills, 1985).

The benefits of developing study skills.

Colleges across the country have seen the benefits of student life on their campuses in assisting students during their transition (Astin, 1984; Britton & Pappas, 2010; Schlossberg, 1989; Zhao & Kuh, 2004). One such endeavor involves time management programs, housed in either the student affairs or counseling centers on college campuses (Britton & Tesser, 1991). Students spend roughly 14.35 hours per week texting and an additional 6.49 hours talking on the phone. The amount of time they reported studying each week was 11.91 hours. Students reported spending three times more hours per week on personal activities as opposed to academic endeavors, included attending classes (Hanson, Drumheller, Mallard, McKee, & Schlegel, 2011). Given these figures it is evident that students are not entering their new environment with the skills necessary to prioritize, and their grades may suffer. Britton and Tesser (1991) found a relationship between time management and grades. Britton and Tesser’s study asked students to
self-evaluate their time management skills and this outcome was correlated with their GPA. The outcome found that as time management skills increased so did academic performance. As a result of studies that have found this relationship, universities have established time management programs in the hopes that stress levels will be reduced by these programs and academic, social, and emotional stressors will be minimized. The product of these programs has been substantiated in that educating students about the stressors associated with time management and informing them on how to better handle their demanding schedules has shown improvements in their academic performance as well as their overall well-being (Macan, Shahani, Robert, & Phillips, 1990).

The development of time management skills is just one of many skills that define successful study habits, according to Pauk and Owens (2004). Five skills associated with good college study habits have emerged from their research. These include: permanent skills, enrichment skills, note-taking skills, and test-taking skills with each of these covering a variety of areas. Permanent skills include time management as well as setting goals, staying focused, preserving memory, and managing stress. Enrichment skills are associated with reading improvement, enhancing vocabulary, and increasing visual intelligence. The third set of skills involve note-taking. Many students are familiar with note taking from their high school classes. However, this skill can be enhanced by understanding the preparation necessary for good note taking. Also, learning how to take useful notes regardless of how the material is presented. By developing these skills the student can get the maximum benefit from their notes when preparing for assignments or tests. Lastly, test-taking skills focus on test anxiety and how to manage this anxiety. Also, preparation for different forms of college testing, objective and essay, are included in this skill development (Pauk & Owens, 2004). Many new freshmen may not be aware of their
learning styles and may benefit from the many resources available to them on campus to shed light on the importance of these skills and how to develop them throughout their academic journey (Pauk & Owens, 2004). Developing good study habits the first year of college and beyond can be difficult in the midst of the other emotional issues one must face during the transition from high school to college. As students are learning how to study and manage their time better they are also dealing with the emotional issues of reevaluating their morals and belief system imparted on them throughout their childhood (Pauk & Owens, 2004).

**The benefits of spiritual development programs.**

College students have lived the majority of their lives with family and friends who have constructed a belief system around them (Braskamp, 2007). Many colleges are developing programs that assist students in establishing their own morals and reassessing their convictions. However, spiritual development, as it relates to students, is all-encompassing and does not only include religion. Love and Talbott (1999) state that there are five areas that relate to spiritual development. The first has the individual reflecting upon and validating who they are and what they want to become, ultimately to achieve unity within oneself. Secondly, the student is kind to others and to themselves. They are establishing healthy relationships and habits that will guide them toward a balanced existence. The third aspect encourages the fostering of these healthy relationships and also establishing a civic connection with the outcome being a greater understanding of the self. The fourth attribute of spiritual development involves the exploration of life goals and the development of purpose in one’s life. These students are allowed to investigate their curiosities and proficiencies in the establishment of their life plan. Lastly, the fifth element is related to religion and being receptive to a higher influence that surpasses a mortal presence (Love & Talbott, 1999). “Spiritual development is critical both to the integrated
development of the student and to the fulfillment of our responsibility to educate the whole student” (Capeheart-Meningall, 2005, p. 33). Taking all these approaches and combining them into one holistic approach will, in theory, assist students in becoming their best self.

**The Benefits of a Holistic Approach to Student Development**

By combining each of these programs into one all-inclusive healthy living environment the student is receiving all of these skills and experiences in one setting. The entrance into a program immediately encourages the formation of relationships with faculty, staff, and students, as well as the community (Astin, 1993). The establishment of these relationships is beneficial to the university in that the student feels a connection, which increases their social involvement and academic success (Astin, 1984; Wilcox, Winn, & Fyvie-Gauld, 2006). The encouragement of healthy habits and the development of understanding oneself will increase self-worth, which stated earlier improves academic performance (BrasKamp, 2007). However, these holistic approaches to student development may be difficult to institute and effectively maintain in that their efforts are too broad. Many institutions choose to create a multitude of programs that each focus on a particular issue common to college students such as physical health (Koff & Bauman, 1997). This study evaluated if a holistic approach to wellness was beneficial or if it was overwhelming to students who are just entering college as well as those progressing through their academic career. A holistic approach to student development has been instituted for some time involving a group of students known as student athletes (Hollis, 2001). They have all of the above mentioned resources available to them through multiple settings to help them become their best socially, academically, and physically. However, due to the pressure associated with academic and athletic performance stress may not be reduced in these groups (Pinkerton, Hinz, & Barrow, 1989).
Stress and the Student Athlete

When compared to an incoming student, the student athlete’s environment is completely different (Pinkerton, Hinz, & Barrow, 1989). They are immediately placed in many of the above programs (Hollis, 2001). However, they must also manage their athletic obligations. Student athletes instantly have an established social group containing individuals with many diverse backgrounds but with a common interest (Vanover & DeBowes, 2013). Student athletes must maintain a certain grade point average in order to continue playing in their particular sport so many athletic departments have mandatory study sessions, time management workshops, and tutors on call. Any problems they are facing whether it is social or academic can be discussed with an athletic counselor. Furthermore, they are encouraged to maintain adequate diet and exercise in order to compete at their full potential. With the myriad of resources available to college athletes does it help in reducing their stress levels? The desire for perfection and pressure to perform well in both academics and on the field endeavors may prove too much for college athletes. As stated earlier the establishment of a social group helps students cope with stressful situations. Swenson, Nordstrom, and Hiester (2008) found that new freshmen who established a close college friend their first semester had an easier transition than those who did not. The study implies that involvement in student activities on campus can have a positive impact on the first year of college life for first time students. This holds true for athletes as well because not only are they making a friend, they also have a team of supporters (Vanover & DeBowes, 2013). This social group not only helps the transition to college and the team but colleges are relaying the importance of staying active. Exercise is a great stress reducer and can relieve some of the pressures associated with college life (Warburton, Gledhill, & Quinney, 2001). This would imply that athletes should exhibit lower stress levels than the normal college population. Hudd et al.
(2000) found this to be true, with athletes reporting significantly lower stress levels than non-athletes. However, this was self-reported information from students who stated if they were athletic, not necessarily involved in collegiate athletics. Stevens, Loudon, Yow, Humphry, and Bowden (2013) state that collegiate athletes are involved in a fast-paced, high stress environment and that may counteract exercise as a stress reducer.

Student athletes’ have stated that the stress and pressure placed upon them has harmed them mentally and emotionally (Stevens et al., 2013). Furthermore, they report physical ailments associated with their stress levels including but not limited to, headaches, digestive issues, tiredness, sleep disturbances and constant tension (Stevens et al., 2013). Even though these students report greater mental, physical, and emotional distress they reported lower levels of alcohol and cigarette use when compared to non-athletes (Pritchard, Milligan, Elgin, Rush, & Shea, 2007). However, athletes reported lower body satisfaction scores and a greater prevalence of disordered eating when compared to non-athletes, with female athletes reporting greater issues in these areas than male athletes. The study found that women athletes had a 23% greater chance of developing an eating disorder when compared to females who did not participate in collegiate athletics. Male athletes showed an 8% increase over their non-athletic counterparts (Pritchard, Milligan, Elgin, Rush, & Shea, 2007). The self-reported high levels of stress associated with college athletics may be cause for concern, however these students have been found to have better coping strategies when compared to their non-athletic peers. Stress may be all consuming for student athletes, but they have the proper coping mechanisms in place to handle the stress before it escalates into depressive symptoms. Male student athletes reported lower prevalence of depression when compared to their non-athletic peers by 13.8% (Proctor & Boan-Lenso, 2010). The literature seems to verify that although student athletes are thrust into an all-consuming
athletic environment that demands a lot of them physically and emotionally, having the proper resources in place can assist in their development. However, not all students are athletic or have the desire to join an intramural team. Therefore, colleges are developing programs within residence life that can create an instant social group and provide resources to assist in the transition from high school to college. Due to the disparity in research findings regarding stress and athletics, this study evaluated if being a student athlete, as well as residing in a healthy living residence hall were good predictors of stress and depression levels as reported by undergraduate students.

The Benefits of a Healthy Living Residence Hall

A program that can be developed to meet each of the demands discussed above (social support, healthy living resources, time and stress management workshops, and spiritual support) is a living-learning wellness program. Astin (1984) stated the importance of living on campus and being involved in extracurricular activities and academic interests as a positive indicator of student development and success. The student is immediately placed into a social group in which constant interaction is encouraged, given multiple forms of literature on fitness and nutrition, and they are encouraged through study skills workshops, curfews, and noise regulations to focus on their studies (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011). Healthy living establishments on college campuses are prevalent throughout the United States. However, little research has been performed on the effects of this living environment on student success. A web search was conducted and multiple universities have this as an option for students at all levels of their academic journey. The University of Maine’s WELL residence halls promotes nutrition, fitness and overall well-being by collaborating with other departments on campus such as the fitness center and dining services (http://umaine.edu/reslife/living-learning-communities-2/). The
University of Wisconsin Eau Claire has a similar program but they also focus on the mind-body connection and incorporate stress management techniques into their program http://www.uwec.edu/housing/Resources/LLC/index.htm. Dartmouth University takes it a step further and adds spiritual and emotional awareness to their mission for their healthy living residence halls (http://www.umassd.edu/housing/livingoncampus/firstyear/). As is the case with these and the majority of healthy living residence halls the students are asked to sign an agreement that states they will not be consuming any alcohol, drugs, or tobacco products during the duration of their stay in the healthy living residence halls. Alcohol use seems to be the driving force behind the idea of a healthy living residence hall (Finn, 1996). Finn also found that even though vandalism decreased when substance free housing was implemented; he argues that the students enrolling for these programs were most likely non-drinkers or light drinkers to begin with. He believes that healthy living residence halls may not have as much of an impact on reducing drinking as previously thought. McCabe et al. (2007) found similar results eleven years later in that students who chose to participate in these programs were less likely to drink in the first place; more than likely due to parental influence. Furthermore, when compared to freshmen not residing in the healthy living residence hall the students participating in the program had less association with alcohol than those who drank on a regular basis. However, the implementation of a healthy living residence hall could have other benefits aside from a decrease in alcohol and drug use.

These programs take a holistic approach to student development and, when these issues are tackled separately, it has shown to increase grades and students’ overall well-being (Finn, 1996; Hudd et al., 2000; Liu & Liu, 2000). For example, assisting students in their healthy eating habits and incorporating an exercise regimen has shown to increase grades and decrease stress
levels (Miller & Divin, 2008). Furthermore, implementing study habits and time management workshops have demonstrated positive benefits to students as well, all of which were discussed earlier (Britton & Tesser, 1991). By creating an environment that is all encompassing the benefits of these programs should be evident. However, there is little research to support this claim; this study hoped to establish that the holistic healthy living residence hall was a benefit to college students regardless of their academic rank. It is evident based on the number of these programs established that universities see the benefits irrespective of the literature. Universities across the country are developing their own healthy living environments for students. Even though things are done differently at each of these institutions, the premise remains in promoting a healthy lifestyle for students in order for them to better succeed both academically and socially. The intent of this research was to demonstrate that residing in a healthy living residence hall assist in lowering stress and depression among college students when compared to student athletes and the general college population.

**Conceptual Framework - SPICES Model of Wellness**

A regional, public, four-year institution located in the southeastern region of the United States, designed a comprehensive wellness program in 2008 termed the LIFEHouse project. The program is a comprehensive healthy living/learning opportunity for on-campus residents and fosters positive decision making and assists students by educating them on healthy alternatives.

The program focuses on more than just drug intervention, which currently is the focus of most wellness programs in the nation. “The healthy living residence opportunity, also known as the LIFEHouse Project, provides a comprehensive health promoting environment 24/7, fitness assessments, and a variety of educational sessions, fitness opportunities, and strategies for enhancing wellness” (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011). Upon entry into
the program the students’ blood pressure and body mass index is calculated for self-knowledge and future reference. Furthermore, the participants are given a wealth of healthy living opportunities including: exercise classes, stress management courses, time management training, and nutritional education, to name a few. The LIFEHouse project was designed by student affairs personnel and utilizes the SPICES model (see figure 2.2) which accentuates the importance of a holistic approach to healthy living.

![SPICES Model of Wellness](image)

*Figure 2.2. SPICES Model of Wellness (McIntosh, Renfroe, Vaughn, Mayes, & Jaques, 2011).*

The program is designed as a living/learning community in which students reside on a healthy living floor of a residence hall. The residence hall setting was chosen to promote an all-encompassing healthy living environment. The program took into consideration many student affairs programs across the nations that demonstrated positive results for student success. It took these approaches and combined them into a holistic model of wellness.

The individual parts of the SPICES model have been researched at length and discussed in this chapter. The model includes spiritual development, cultural involvement and awareness, social interaction, physical wellness, controlling of environmental factors, and development of intellectual skills, as being beneficial to the development of students throughout their academic career. This study evaluated how all of these parts work together in lowering student’s stress...
levels thus decreasing the chance of onset for depression (see figure 2.3). The researcher anticipated that the hypothesized conceptual framework model would demonstrate that, as the segments of the SPICES model worked together, the individual, when compared to non-healthy living residence and non-student athletes, would show a decrease in stress and depression levels.

Figure 2.3. Conceptual Framework

The hypothesis of the study was that students who participated in this all-inclusive living environment would see positive outcomes in the lowering of their stress related to academic, social, and personal issues. As was discussed earlier in the chapter, the lowering of stress has a direct correlation with the decrease in onset of depression. Meaning, the less stressed individuals are the less likely they are to developing a depressive disorder. Furthermore, this model was compared to student athletes in the hopes that similarities would emerge from both collegiate settings. It could be argued that the student athlete experiences all of these parts in their athletic program. However, the stress associated with performing in an athletic setting day after day may have differing outcomes. In that regard, it was hypothesized that student athletes and healthy living residents would differ on their self-reported stress and depression levels, as well as differ significantly from the general student population.
Summary of Literature Review

The current chapter has defined and discussed, through the results of multiple studies, the prevalence of stress and depressive disorders afflicting college students today. Also, Astin’s student involvement model was reviewed in detail as an outline for student affairs personnel, faculty, and administrators to formulate a plan for helping these students reduce stress while in college. Many colleges have programs and workshops in place and the success of these programs were discussed at length. The development of a conceptual framework model was produced to assess how these approaches that have been combined into one model, the SPICES model, can better student’s academic journey by reducing stress and depression levels experienced during college. The SPICES model contains a holistic approach to student development. These programs were combined into one healthy living environment involving spiritual, social, physical, environmental, cultural, and intellectual development into its all-inclusive program. The literature is sparse in regards to holistic approaches to development, especially contained within a resident hall environment. Furthermore, the literature concerning student athletes and their levels of stress differs in its findings. The student athlete in the past has strictly been compared to the general student population. However, it was interesting to see the stress levels of these athletes when compared to students, residing in an environment similar to their own, without the added stress of athletic competition, all the while comparing them both to the general student population.
CHAPTER 3

METHODOLOGY

Stress and depression levels reported by college students are alarming. Many colleges are evaluating how they can better assist these students with the stressors that they face upon entering college and throughout their educational journey. In the fall of 2008 a regional four-year public institution followed this trend by creating a healthy living residence hall. Minimal research has been done on this holistic setting in regards to its impact on student success. The hopes of this study was to fill this gap by developing an explanatory model using two multiple regression analyses to establish if environment, gender, ethnicity, and classification are strong predictors for establishing stress and depression levels of undergraduate students. The environment variables examined three groups: healthy living residents, student athletes, and the general student population. The evaluation of the student athletes was to gain a new perspective on the stress and depression levels of these students compared to healthy living residents, who share the same resources without the added distress of athletics. This quantitative study expected to shed light on the stress and depression experienced by student athletes by comparing them to a similar group. It has been stated that the stress reducing benefits of exercise may be curtailed in student athletes due to the many stressors they face daily. These two groups were compared to the general student population whom was not involved in either of these approaches to student development and served as the criterion group of the study.
The quantitative approach was chosen due to the sensitive nature of the questions asked. A quantitative analysis was also chosen to obtain trend data to explain any consistencies, or lack thereof, within the data being analyzed. Furthermore, the survey did not contain open-ended responses and the subjects were not interviewed. The data are strictly numerical and no word analysis was needed (Creswell, 1994). As stated above, respondents surveyed were from one of three categories: healthy living residents, NCAA Division-II athletes, or the general undergraduate student population, all of whom attended the same regional four-year public university located within the southeast region of the United States in the fall 2009 semester. This study developed two prediction models using these three groups as the independent dummy variable, along with gender, ethnicity, and classification to determine if these were strong predictors of stress and depression levels in undergraduate college students.

The respondents were asked to complete the Health Risk Appraisal Assessment tool and the responses were analyzed to answer the following research questions.

**Research Questions**

1. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of stress in undergraduate students attending a four-year institution?
2. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of depression in undergraduate students attending a four-year institution?

These questions were answered by conducting two multiple linear regression analyses, one on the dependent variable of stress and the other on the dependent variable of depression, establishing if the following independent dummy variables were in fact strong predictors to the
Null Hypothesis

This research study utilized pre-existing data, gathered by the researcher in 2009. All healthy living residents and student athletes were given a Health Risk Appraisal Assessment during the 2009 fall semester. Also, the entire student body was given the survey during the same timeframe. The following are the null hypotheses for the research study.

\( H_0:1 \): The dependent variable of stress is not affected by environment, gender, ethnicity, or classification of college students.

\( H_0:2 \): The dependent variable of depression is not affected by environment, gender, ethnicity, or classification of college students.

The research methodology outlined in this chapter will discuss the process used in the selection of the samples from the three populations, instrumentation used, data collection techniques, treatment and analysis of the data, and a summary of the process.

Population and Sample

The respondents included in this study consisted of healthy living residents, NCAA Division-II student-athletes, and the general student population from a public four-year university located in the southeastern region of the United States. Please see Table 3.1 for a breakdown of the sample as it compares to the population of gender, classification and ethnicity.
Table 3.1

Sample to Population Comparison

<table>
<thead>
<tr>
<th>Group</th>
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<th>Population</th>
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<th>$p$</th>
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</tr>
<tr>
<td>Non-Freshman</td>
<td>70</td>
<td>68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant at .05 alpha level and *** at .001 alpha level.

Although the sample to population percentage for the three groups was close, the chi-square analysis found that the sample did not adequately represent the population in question. However, the researcher argues that the sample percentages were close enough to the population in question to make adequate inferences. When a chi-square is found to be significant there is a chance of making a Type I error, determining there is a difference when in fact no significant difference exist, in short a false positive. The chance of making this type of error is 5%, due to the low probability of making this error the researcher evaluated the sample in question and felt that important information was gleamed concerning the population. The University sampled is of medium-size (roughly 7,000 students) and primarily a non-residential large master’s college, according to the Carnegie Classification (Carnegie Foundation for the Advancement of Teaching, 2010). The institution has over 100 undergraduate majors available to students with eight graduate programs. The class sizes are small with a teacher to student ratio of 20:1. The institution was chosen for this study due to the establishment of a holistic healthy living residence hall, in 2008, that assists students in various areas (i.e., tutoring, study skills.
workshops, healthy eating seminars, exercise program, drug/alcohol abstention, etc.) to reach their full potential.

This study utilizing pre-existing data captured in the fall of 2009. The use of pre-existing data was chosen because the administration date was one year after the establishment of the healthy living residence hall and it was important to see if this new setting had an initial impact on student well-being. In the fall of 2009, mid-semester, the healthy living residents were given a paper/pencil format of the survey during a mandatory meeting. All residents did attend but not all completed the lengthy survey. Also, the student athletes were tested in the same regard during a mandatory monthly meeting in which the survey was administered and all attended, but again all did not complete the survey in its entirety. The sample of university students in this study referred to as the criterion group, were given the survey through an online system called SurveyMonkey. The online system was utilized due to the large population of undergraduate students attending the university, 6,106 in the fall of 2009. The online survey was administered to all 6,106 undergraduate students attending the university in the fall 2009. There may be an issue with groups receiving the survey in two different formats, online and paper. However, the researcher argues that there are issues with both methods in that online participants are afraid of tracking capabilities and paper samples may feel the same lack of anonymity in a group setting. The sample consisted of only the students who responded to the survey, so there may be some bias due to socio-economic status and computer access, as well as a proclivity to respond to the sensitive topic being analyzed. Furthermore, this general sample included student-athletes and healthy living residents who were identified and removed from this sample to ensure overlap did not occur. The sample size needed in order to generalize to the three groups will be assessed using Tabachnik and Fidell’s (2007) equation, which will be discussed in Chapter 4. It’s
important to note that the response rate on this lengthy survey may have been affected by time and convenience restraints. Furthermore, chi-square analyses were used to establish how well the samples matched the population in regards to gender, ethnicity, and classification.

**Instrument**

The Health Risk Appraisal Assessment tool was created by Polar\textsuperscript{TM} TriFIT, and is a software program that evaluates an individual’s current and past health history. The assessment includes 157 questions on the following eight topics: heart disease risk, cancer risk, diabetes risk, prevention issues, stress assessment (State-Trait Anxiety Inventory), depression assessment (Beck Depression Inventory-II), nutrition habits, and safety issues. This study focused on the stress and depression assessment sections. Polar\textsuperscript{TM} TriFIT (Polar, 2011) utilized already validated outsourced content for the construction of the Health Risk Appraisal. The Beck Depression Inventory-II was used for the 20 questions regarding depression assessment and the Trait Anxiety Inventory was used for the stress assessment section and has 19 questions. The administration of the survey was approved by the Institutional Review Board (IRB) of the institution being studied in 2009 and an informed consent document was signed by all participants. The online participants were given an online consent document upon entry to the online survey and were told that continuing to the online survey tool ensured their approval of informed consent. An additional IRB approval was received from the researcher’s university in the spring of 2014.

**Beck Depression Inventory-II.**

According to Katz, Katz, and Shaw (1999), Beck and his colleagues developed the Beck Depression Inventory in 1961. The original scale was used as a clinicians’ tool to diagnose depression. The Inventory is a self-administered twenty-one item test and evaluates individuals
aged 13 years and older. The inventory takes approximately 10 to 15 minutes for completion and scoring (Katz et al., 1999). The items consist of an ordinal scale from 0-3, with 0=almost never, 1=sometimes, 2=often and 3=almost always. The inventory was revised in 1971 as a self-report measure of depression and updated in 1987. The update in 1987 was made to dismiss redundancy for identical symptoms and also to avoid double negatives (Nezu, Nezu, McClure, & Zwick, 2002). The modified version was known as the BDI-IA, and made scoring and administration easier. The BDI-IA asked the respondents to base their answers on how they had felt in the past week (Dozois & Covin, 2004). Dozois, Dobson, and Ahnberg (1998) reported that the content validity of the BDI was one of the limitations because the inventory only covered six of the nine criteria from the DSM-V. They stated that the BDI-IA did not take into consideration the physical characteristics of the disorder. Therefore, the tool was updated and retitled the BDI-II in 1996 (Murphy, Palke, Impara, & Spices, 2002). Beck eliminated four items from the original BDI and replaced them with four new items (Dozois & Covin, 2004). The eliminated items were body image, work difficulty, weight loss, and somatic preoccupation. The four new items consist of agitation, worthlessness, loss of energy, and concentration difficulty. Seventeen of the response options were re-worded, and two items were moved. The BDI-II asks the respondents to base their answers on how they have been feeling in the past two weeks instead of just one week (Nezu et al., 2002). Dozois et al. (1998) performed a psychometric evaluation of the BDI-II and found that the BDI-II was a significantly better inventory than the original version when evaluating factor structure. The reliability of the BDI-II was extremely high at .90 (Steer, Ball, & Ranieri, 1999). Furthermore, Arnau, Meagher, Norris, and Bramson (2001) reported an internal consistency index of .94.
State-Trait Anxiety Inventory.

Speilberger and his colleagues developed the State-Trait Anxiety Inventory in 1970. The original scale was used as a clinicians’ tool to differentiate anxiety from depression. The Inventory contains two self-administered twenty item scales and evaluates individuals aged 13 to 70 years old. However, a child version has been created as well. The current version was designed for a sixth grade reading level. The two scales differentiate state anxiety from trait anxiety; the former being short range anxiety/stress and the latter referring to enduring anxiety/stress. The inventory takes approximately 10 minutes for completion and scoring (Tilton, 2008). The items consist of an ordinal scale from 0-3, with 0=almost never, 1=sometimes, 2=often and 3=almost always. The inventory was revised in 1983 and this remains the most recent update. The version used in the Health Risk Appraisal Assessment tool is an abbreviated version of the inventory and mainly focuses on trait anxiety. Due to absence of certain questions and that the focus of the Health Risk Inventory Assessment tool is evaluating stress instead of anxiety; a Cronbach’s Alpha will be performed on the questions used by the Health Risk Inventory to establish reliability, to ensure that the survey items measure what it set out to measure: stress. Tilton (2008) did an exhaustive literature review of the original instrument, State-Trait Anxiety Inventory, and found that convergent validity as well as concurrent validity had been adequately established by comparing it to other established anxiety measures; The Anxiety Scale Questionnaire (.73) and the Manifest Anxiety Scales (.85). Reliability has been confirmed utilizing the test-retest measure on both the trait (.86) and state scales (.40) of the survey and these figures are compatible with Spielberger, Gorsuch, and Lushene’s (1970) finding of established reliability in the preliminary review of the instrument (trait .86, and state .54). The
difference in figures relates to the longevity of anxiety being experienced on each scale, with
trait being more prolonged and state resulting in short-term anxiety.

**Procedures**

**Healthy living residents.**

The University designed a comprehensive wellness program for on-campus residents in 2008
termed the LIFEHouse project. The program fosters positive decision making and assists
students by educating them on healthy alternatives. The program focuses on more than just drug
intervention. “The healthy living residence opportunity, also known as the LIFEHouse Project,
provides a comprehensive health promoting environment 24/7, fitness assessments, and a variety
of educational sessions, fitness opportunities, and strategies for enhancing wellness” (McIntosh,
Renfroe, Vaughn, Mayes, & Jacques, 2011). Upon entry into the program, the students’ blood
pressure and body mass index are calculated for self-knowledge and future reference.
Furthermore, the participants are given a wealth of healthy living opportunities including:
exercise classes, stress management courses, time management training, and nutritional
education, to name a few. The students are required to attend monthly meeting where these
issues are discussed in depth and resources are available to assist the students with their needs.
The Health Risk Appraisal, along with an informed consent form, was administered during one
of these mandatory meetings.

The LIFEHouse project was designed by student affairs personnel at the institution and
utilizes the SPICES model (see figure 3.1) which accentuates the importance of a holistic
approach to healthy living (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011). This model
was created by the founders of the LIFEHouse project and can be viewed in Figure 3.1.
The program is designed as a living/learning community in which students reside on two floors of a residence hall. The residence hall setting was chosen to promote an all-encompassing healthy living environment. The holistic approach includes the following resources for the residents (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011):

- Collaborative programming with student health services and the student recreation center
- Screenings;
- An on-campus student recreation facility offering a full range of fitness classes, weight training, personal training and fitness education;
- A Yoga and Pilates studio in the residence;
- Promotion of substance-free living;
- Monthly roundtables;
- Utilization of a wellness model for project design;
- Emphasis on development of self-knowledge;
- Providing a community of students striving to live a healthy lifestyle;
- Fostering a community atmosphere; and
Electronic card access door and video surveillance for safety and security.

The LIFEHouse project participants are both male and female students who are located on the third and fourth floors of a historic building located on the campus of the four-year regional university. Each floor can accommodate 56 students. The participants are mainly freshmen but do include students from all classifications. The students are required to sign a healthy living contract and must answer to the Director of Residence Life if they do not abide by the guidelines within the contract.

**Student Athletes.**

The athletes were chosen for evaluation in this study due to the demanding nature of their sport, academics, and other life issues. They must juggle a multitude of responsibilities all while maintaining a certain level of excellence in both academics and their chosen sport (Stevens, Loudon, Yow, Humphry & Bowden, 2013). It was of interest to the researcher to evaluate this high demand against the other two groups in seeing if increased pressures caused an upsurge of stress in predominately healthy people, as athletes have to uphold a level of fitness and well-being in order to perform well. It is established that exercise helps alleviate stress (Warburton, Gledhill, & Quinney, 2001). However, it is interesting to research if prolonged, excessive exercise can have differing outcomes. Stevens, Loudon, Yow, Humphry and Bowden (2013) believe that the high stress environment of a student-athlete can counteract exercise as a stress reducer. Student athletes are thrust into a holistic atmosphere, much like a healthy living residence hall. The student athletes at the four-year public institution must attend weekly study hall sessions in order to achieve their required grade point average to maintain eligibility. Coaches and trainers require daily work-outs and healthy eating for top performance. Also, they attend time and stress management programs and are immediately placed into a social group with
likeminded individuals. Again these student athletes are required to attend weekly study hall sessions and it was during one of these mandatory sessions that the Health Risk Appraisal Assessment tool, along with an informed consent form, was given to them in a paper/pencil format (McIntosh, Renfroe, Vaughn, Mayes, & Jacques, 2011). As stated earlier, included in the hypotheses is the impact of environment on stress and depression levels. Given the literature it was hypothesized that the model may reflect that student athletes produce lower stress and depression scores than non-student athletes, but higher scores when compared to healthy living residents due to the demanding nature of their sport (Proctor & Boan-Lenzo, 2010).

**Criterion Group.**

A baseline group needed to be established in order to evaluate the levels of stress and depression experienced by the above mentioned groups: healthy living residents and student athletes. It is important to know how the general student population handles stress and how they are affected by depression in order to assess the scores of the other two groups. Of those students from the criterion group sampled there were questions inquiring their participation in college athletics and whether they resided in the healthy living hall. If these questions were answered in the affirmative these students were excluded from the general sample group and re-coded as either an athlete or healthy living resident. The university sample was obtained by sending an online version of the Health Risk Appraisal Assessment tool, developed by the Office of Institutional Research, Planning, and Assessment. The Office received permission from Polar to create an online version of their survey tool. The survey contained a cover letter which was included in the email that discussed informed consent and notified the respondent that by continuing to the online survey they were in fact consenting. The survey was well received by the university community and a representative sample was obtained.
Analysis of Data

Data was evaluated using SPSS IBM Statistics 21 software. Initial analyses of the data provided descriptive statistics including frequencies, percentages, and measures of central tendency.

Analysis of Survey Questions.

Trait Anxiety Inventory.

The analysis focused on two surveys: one assessing stress and the other depression. The Trait Anxiety Inventory was used in the Health Risk Appraisal questionnaire and asked the following questions to assess an individual’s stress level (each of these contain the same scale: 0=almost never, 1=sometimes, 2=often, and 3=almost always, some of these questions are reverse scored):

1. I am “calm, cool, and collected” (reverse scored);
2. I feel problems are piling up so that I cannot overcome them;
3. I feel my heart racing or pounding without exercising;
4. Some unimportant thought runs through my mind and bothers me;
5. I feel secure and at ease (reverse scored);
6. I feel I am “losing out” because I can’t make up my mind;
7. I feel dizzy, light-headed, or faint;
8. I wish I could be as happy as others seem to be;
9. I feel joyful and confident (reverse scored);
10. I feel worried and tense;
11. I am afraid of people and things;
12. I have stomach pains or indigestion;
13. I am inclined to take things hard;
14. I sleep poorly or have nightmares;
15. I enjoy sitting quietly (reverse scored);
16. I feel rushed or hurried;
17. I get headaches or neck pains;
18. I get flushed or sweaty without exercising, or I get hives;
19. I am eager for new challenges and tasks (reverse scored).

The score for these nineteen questions were combined to give an overall score per participant. These scores were aggregated for the sample and statistical analysis was performed to answer the following research question.

1. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of stress in undergraduate students attending a four-year institution?

This research question was evaluated using multiple linear regression analysis (MLR). “MLR is a method for studying the effects and the magnitudes of the effects of more than one independent variable on one dependent variable using principles of correlation and regression” (Kerlinger, 1986, p. 603). The analysis looked at coefficient of multiple correlation, or $R^2$. The results of this statistic, which range from 0 to 1.00, give the proportion of the variance of the dependent variable, stress, which is accounted for by the independent dummy variables of environment, gender, ethnicity, and classification. In evaluating these $R^2$'s, the model provided the best linear combination of the independent variables in predicting depression. The multiple regression formula is as follows:
When using multiple linear regression as a form of analysis certain assumptions must be met. The following assumptions were tested in the current study (Osborne & Waters, 2002):

1. Variables are normally distributed.
   a. Tested by visual review of data plots, kurtosis, skew, P-P plots and Kolmogorov-Smirnov tests. Evaluates the prevalence of outliers.

2. A linear relationship between the dependent and independent variables.
   a. This assumption will be evaluated by observing a plot of the residuals versus predicted values.

3. Variables are reliable, measured without error.
   a. Assumption will be assessed using Cronbach’s alpha with an acceptable range of .7-.8.

4. Homoscedasticity, all levels of the independent variables have the same variance of errors.
   a. This assumption will be evaluated by observing a plot of the residuals versus predicted values.

**Beck Depression Inventory – II.**

The second survey, the Beck Depression Inventory-II asked the following questions to assess an individual’s likelihood of developing depression (each of these contain the same scale: 0=almost never, 1=sometimes, 2=often, and 3=almost always, some of these questions are reverse scored):

1. I feel “blue or sad”;

2. I feel confident and hopeful about the future (reverse scored);

3. I feel like a failure;
4. I don’t enjoy things the way I used to;

5. I feel guilty;

6. I have a feeling something bad may happen to me;

7. I am pleased with myself (reverse scored);

8. I blame myself for everything that goes wrong;

9. I have crying spells;

10. I get irritated or annoyed;

11. I am interested in people and enjoy being with them (reverse scored);

12. I am unsure of myself and try to avoid decisions;

13. I feel that I look attractive and healthy;

14. I sleep poorly and am tired in the morning;

15. I am energetic and eager to take on new tasks (reverse scored);

16. My appetite is not as good as it used to be;

17. I am as interested in sex as I used to be (reverse scored);

18. I am concerned about my stomach and my bowels;

19. I feel healthy (reverse scored);

20. I have trouble doing my work.

These scores were aggregated for the sample and statistical analysis were performed to answer the following research question.

1. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of stress in undergraduate students attending a four-year institution?
This research question was evaluated using multiple linear regression analysis (MLR) as well. In evaluating these $R^2$’s, the model will give the best linear combination of the independent variables in predicting depression. The multiple regression formula is as follows:

$$Y' = \alpha + b_2X_2 + \ldots + b_kX_k$$

The above mentioned assumptions were evaluated in this model as well.

**Cronbach’s Alpha.**

A Coefficient Alpha, developed by Cronbach, was performed on the State-Trait Anxiety Inventory used in the Health Risk Appraisal Assessment tool, because the intended measure is stress and not anxiety, also questions from the inventory were left out. The same analysis was performed on the Beck Depression Inventory-II to ensure reliability for the sample obtained. Cronbach’s Alpha is an internal consistency measure which evaluates the degree to which the different items on a test measure a trait or construct or, in this case, the degree in which the questions chosen measure the specified topic consistently. The formula is (Kaplan & Saccuzzo, 2001, p. 112):

$$\alpha = 1 - \frac{\sum s_i^2}{N-s}$$

A higher alpha estimate indicates that the individual questions within the construct are more closely related. The results will need to be a .70 or higher to ensure that the questions consistently measure the intended construct; stress/depression (Kaplan & Saccuzzo, 2001).

**Conclusion**

The research questions were important due to the limited literature surrounding the usefulness of these living environments with regard to student success. In evaluating this new healthy living residence hall program it was the hopes that these questions would be answered. However, there are some limitations to the study in that one group received the survey
electronically while the other two groups received a paper-pencil format. Other limitations include the self-selection of the groups, and the lack of baseline data for comparison purposes. The methods used in gathering and evaluating the data assessed the researcher’s hypotheses stated at the beginning of this chapter and will be discussed in detail in the following pages.
CHAPTER 4

RESULTS

Descriptive Analysis

A total of 492 students were represented in the overall sample. Three groups were established; 8.1% (n= 40) healthy living residents, 35.2% (n=173) student athletes, and 56.7% (n=279) general student group. The sample consisted of 38% (n=187) male and 62% (n=305) female students. In terms of race or ethnicity, 78.3% (n=385) were White and 21.7% (n=107) were Minority (due to the low response rate per minority category this was grouped into one variable). The final independent variable, classification, consisted of 21.7% (n=107) freshmen and 78.3% (n=385) sophomore, junior, and seniors grouped into one variable due to the low response from each category (Table 4.1).

There was a statistically significant difference in the gender, race, and class composition of the three groups (healthy living, athletes, and the general student population). There was a statistically significant difference in the proportion of males and females between the three groups ($\chi^2 = 96.69, df=2, p=.001$). Additionally a statistical significant difference existed in the ratio of White students to Non-White students within the three groups ($\chi^2 = 19.87, df=2, p=.001$). The final variable of class confirmed a significant difference between new freshmen and all other levels between the three groups ($\chi^2 = 6.52, df=2, p=.038$).
Table 4.1

Descriptive Statistics of the Sample

<table>
<thead>
<tr>
<th>Group</th>
<th>Total Sample</th>
<th>Healthy Living</th>
<th>Athletes</th>
<th>General Student</th>
<th>x²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>187</td>
<td>38.0</td>
<td>28</td>
<td>70.0</td>
<td>57</td>
<td>32.9</td>
</tr>
<tr>
<td>Female</td>
<td>305</td>
<td>62.0</td>
<td>12</td>
<td>30.0</td>
<td>116</td>
<td>67.1</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>385</td>
<td>78.3</td>
<td>30</td>
<td>75.0</td>
<td>117</td>
<td>67.6</td>
</tr>
<tr>
<td>Minority</td>
<td>107</td>
<td>21.7</td>
<td>10</td>
<td>25.0</td>
<td>56</td>
<td>32.4</td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>146</td>
<td>29.7</td>
<td>18</td>
<td>45.0</td>
<td>55</td>
<td>31.8</td>
</tr>
<tr>
<td>Other</td>
<td>346</td>
<td>70.3</td>
<td>22</td>
<td>55.0</td>
<td>118</td>
<td>68.2</td>
</tr>
</tbody>
</table>

*significant at .05 alpha level and *** at .001 alpha level.

Table 4.2

Crosstabs of Sample by Environment, Gender, Ethnicity, and Classification

<table>
<thead>
<tr>
<th>Gender</th>
<th>Ethnicity</th>
<th>Classification</th>
<th>Healthy Living</th>
<th>Athletes</th>
<th>General</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>White</td>
<td>Freshman</td>
<td>9</td>
<td>20</td>
<td>44</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Freshman</td>
<td>13</td>
<td>25</td>
<td>146</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>Minority</td>
<td>Freshman</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Freshman</td>
<td>3</td>
<td>8</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Freshman</td>
<td>5</td>
<td>24</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Freshman</td>
<td>3</td>
<td>48</td>
<td>30</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>Minority</td>
<td>Freshman</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Freshman</td>
<td>3</td>
<td>37</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>40</td>
<td>173</td>
<td>279</td>
<td>492</td>
</tr>
</tbody>
</table>

Stress and Depression Scale Analysis

A Cronbach’s Alpha was used to assess the reliability of the two instruments as it relates to the sample chosen (Field, 2013). Field (2013) states that an acceptable alpha range is .7 to .8. This range ensure reliability of the construct, meaning that items that are intended to measure a
general concept will yield similar scores. The Cronbach’s alpha for the Stait-Trait scale was .861 which indicates the tool was a reliable measure. The alpha for the Beck Depression Inventory-II was .885 and clearly indicates that items are highly correlated with one another and therefore measure the intended construct. These two reliability scores are strong. However, it is not desired to have very high reliability scores in that the questions are too highly correlated and may be indicative of repetitive questions (Streiner, 2003).

The average sample Stress scores for the overall sample were calculated (M=34.8, SD=8.3). There was a statistically significant difference between healthy living residents (M=34.9, SD=6.9) student athletes (M=32.4, SD=6.8) and the general student population (M=36.4, SD=9.0). The data show that student athletes had lower self-reported stress scores when compared to the other two groups with the general student population reporting the highest of the three groups. The post hoc analysis revealed, using Bonferroni method, that the only significant difference between the groups was found when student athletes were compared to the general student group (p<.001) (Field, 2013). The \( r^2 \) of .050 indicated a very small effect with only 5% of the variability in Stress scores explained by group assignment.

Depression scores were analyzed for difference between the groups as well. The average sample Depression scores were (M=37.53, SD=9.60). There was a statistically significant difference between the three groups of healthy living residents (M=39.0, SD=9.7) student athletes (M=35.1, SD=8.3) and the general student population (M=38.8, SD=10.1). Post-hoc analysis revealed, using Bonferroni method that the only difference was found when athletes were compared to the general student population (p<.001). The \( r^2 \) of .035 indicated a very small effect with only 3.5% of the variability in Depression scores being explained by the group.
Table 4.3

Descriptive Statistics of Stress and Depression Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Healthy Living</th>
<th>Athletes</th>
<th>General Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SD)</td>
<td>SE</td>
<td>M(SD)</td>
</tr>
<tr>
<td>Stress**</td>
<td>34.9(6.9)</td>
<td>1.10</td>
<td>32.4(6.8)</td>
</tr>
<tr>
<td>Depression***</td>
<td>39.0(9.7)</td>
<td>1.54</td>
<td>35.1(8.3)</td>
</tr>
</tbody>
</table>

*significance at .05 alpha level
**Stress assessment had a range of 19-76
***Depression assessment had a range of 20-80

Multiple Linear Regression Analyses

The research questions address the relationship of a number of independent variables to Stress and Depression scores of undergraduate college students. Of specific interest is the relationship to Stress and Depression levels as they relate to student involvement - healthy living resident or student athlete, specifically. A multiple linear regression analysis was used to assess the linear relationship of many independent variables to a dependent variable. For the two research questions of interest (stress and depression), there were four dichotomous variables (athlete, gender, race, and classification) and one categorical independent variable (involvement). The single categorical independent variable must be subdivided into dummy coded dichotomous independent variables for inclusion in a multiple linear regression analysis. In the process of creating “dummy” codes there are to be $k-1$, with $k$ representing the number of groups within, dummy codes created for the categorical variable. For the current study there would be three less than one, or two (healthy living and athletes), dummy categories created with one referent variable (general student). Therefore, the current study had five independent variables for each of the multiple regression equations.
Assumptions of Multiple Linear Regression.

A multiple linear regression analysis carries assumption about the variables which are necessary in order for an accurate modeling of the data. These pivotal criteria are that the sample size is adequately large, that there are no univariate or multivariate outliers in the data, that independent variables are not highly correlated with one another, and that the distribution of residuals of the final model are normally distributed, linear, and homoscedastic. The first two of these assumptions must be tested before analysis and the others are examined after the regression equation has been established.

Sample size.

Tabachnik and Fidell (2007) discuss a need for a “substantial” case to independent variable ratio in order to be confident in the final regression equation. A few rules of thumb for total sample size in regression are given. Initially they recommend a sample size of \( N \geq 50 + 8m \) where \( m \) is the number of independent variables in the equation. If the goal is to also test the adequacy of individual predictors, not just the multiple correlation coefficient, then the suggestion is a sample size of \( N \geq 104 + m \). A third suggestion is more involved and takes effect size into account. This rule suggests that \( N \geq (8/f^2)+m-1 \), where \( f^2 \) is the effect size equaling .02 for detection of small effect, .15 for detection of a moderate effect, and .35 for the detection of a large effect. Given this information it is evident that the current study met the recommendation with a sample of 492. For the first suggestion, the sample size would need to be greater or equal to 90. The second suggestion the sample size would need to be greater or equal to 109. The third more complex suggestion would require a sample size of 360 for a moderate effect. In evaluating the sample size of each predictor variable it has been recommended that each predictor represent 10% of the overall sample (Rummel, 1970). All of the predictors met
this recommendation with the exception of one, healthy living residents (n=40). Although 53 healthy living residents were sampled not all completed the demographic questions at the end of the survey, therefore they had to be removed from analysis. The group needed a sample of 49 to meet the 10% recommendation. However, the issue lies with the chance of making a type II error, in that there may be significance when none is found.

**Outlier analysis.**

Univariate outliers for the continuous variables (both dependent variables) were assessed as being any standardized score (z-scores) on the variable in excess of 3.29 or below -3.29. Scores above or below these z-benchmarks indicate that the scores are within the area of the distribution where less than 1 out of 1000 cases reside ($p<.001$). The data from the two stress variable was transformed into standardized z-scores and assessed for outliers. Three cases within the stress variable had standardized values above the 3.0 threshold; these cases were not included in the analysis. Depression variables had standardized values below or within the 3.29 to -3.29 ranges.

Univariate outliers for dichotomous variables were assessed using Rummel’s (1970) suggestion that any dichotomous variable with a 90% to 10% split or worse should be considered for removal due to the truncation of correlation coefficients within these categories. It should be noted that for dichotomous data, the analysis of outliers takes place at the variable level as opposed to the case level as with continuous variables. In assessing the variables in this analysis for dichotomous outliers, gender has a 62.0% to 38.0% male to female split and should remain in the analysis since it meets the above criteria. Ethnicity has a 78.3% to 21.7% split and should remain as well. The classification variable demonstrated a 29.7% to 70.3% split and therefore should remain. The dichotomous athlete variable resulted in a 35.2% to 64.8% split and meets
the requirements. The healthy living variable was cause for concern with its 8.1% to 91.9% split as it is on the verge of acceptable but not quite. Given the proximity to the acceptable limit and the importance of this variable it remained in the analysis.

Multivariate outliers were assessed through an examination of Mahalanobis distance values. According to Tabachnick and Fidell (2007, p. 68), Mahalanobis distance is a value that reflects the “distance of a case from the centroid of the remaining cases where the centroid is the point created at the intersection of the means of all variables,” Therefore, in multivariate space, if a case has a Mahalanobis distance that is very far from the center of the multivariate distribution then it should be considered as an outlier and removed from the analysis. The general criterion for determining how far is too far is using the critical value of a chi-square distribution at $\alpha=.001$ with degrees of freedom equaling the number of variables in the multivariate distribution. Any case that has a Mahalanobis distance in excess of this critical value would be considered as an outlier and removed from analysis. Mahalanobis distances were calculated using IBM SPSS Statistics version 20 statistical software for the multivariate distribution of five variables to be used in each of the regression analyses. The critical value for the Mahalanobis distances were found to be 18.58, for stress, which is the critical $\chi^2$ value at an $\alpha=.001$ with five degrees of freedom. The largest distance found for stress and depression was 18.57. None of these distances met the threshold for exclusion so all remaining cases were retained for analyses.

**Multiple Linear Regression Analysis**

Regression analyses were conducted for two separate equations using different dependent variables in order to answer the research questions. The analyses for each question are detailed below.
Stress Scores.

A standard multiple regression analysis was performed using Stress scores as the dependent variable and healthy living, student-athlete, gender, classification and ethnicity as independent variables. All analyses were performed using IBM SPSS Statistics version 20. Cases with missing data were replaced using the “replace missing values” option within SPSS. Once outliers were identified and missing data were replaced, the total sample consisted of 492 undergraduate college students sampled from a regional, four-year, public institution located in the southeastern region of the United States. Table 4.4 presents the correlations between all variables, the unstandardized ($\beta$) and standardized regression coefficients ($\beta$), the semipartial correlations ($sr^2$), the multiple correlation coefficients ($R^2$), and adjusted $R^2$. The linear combination of the independent variables were good predictors of Stress scores, $F(5,486) = 6.234, p<.001$. The multiple correlation coefficient ($R^2=.060$) and adjusted multiple correlation coefficient (Adjusted $R^2=.051$) indicated that around 6% of variability in Stress scores can be explained by the linear relationship of the five independent variables.

The unstandardized beta weights of the individual variables indicated that only two of the five IVs have beta weights that are significantly different from zero. The student-athlete/non-student-athlete beta was significant at the $\alpha=.001$ level ($t=-3.695, p<.000$) with a negative weight of $B = -3.271$. Unique variation explained by this variable was less than 3% ($sr^2=.026$) making athletic status the strongest predictor of the five independent variables. Given that this variable was coded as 0 for non-student athlete and 1 for athlete, then student-athlete status of a student decreases predicted Stress score by 3.271 points, meaning student athletes were less stressed than non-student athletes.
The beta weight for gender was also significantly different from zero at the $\alpha=.05$ level ($t=2.095, p=.037$) with a positive weight of $B = 1.773$. Unique variation explained by this variable was $0.8\% (sr^2=0.008)$. Given that this variable was coded as 0 for male and 1 for female, the female status of a student increased the predicted Stress score by 1.773 points.

The predictive equation for the set of independent variables and the Stress score dependent variable was:

$$\text{Stress score} = 34.983 + \text{Healthy}(-1.471) + \text{Athlete}(-3.271) + \text{Female}(1.773) + \text{White}(-0.239) + \text{Freshman}(0.720)$$

While healthy, white and freshman were all shown in this equation, the beta weights for these variables are statistically equal to zero, therefore, the contribution of these variables to prediction was negligible. These results indicated that healthy living status, ethnicity and whether or not a student is a freshman had no relationship to their reported Stress score. The only variables in this equation that did have a substantial predictive relationship was whether a student was an athlete or a female.

Table 4.4

*Standard Multiple Regression: Stress Score*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Stress</th>
<th>Healthy</th>
<th>Athletes</th>
<th>Female</th>
<th>White</th>
<th>Freshman</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$sr^2$ (unique)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>.002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.471</td>
<td>-.048</td>
<td>--</td>
</tr>
<tr>
<td>Athletes</td>
<td>-.219</td>
<td>-.219</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-3.271***</td>
<td>-.188</td>
<td>.026</td>
</tr>
<tr>
<td>Female</td>
<td>.181</td>
<td>.049</td>
<td>-.441</td>
<td></td>
<td></td>
<td></td>
<td>1.773*</td>
<td>.103</td>
<td>.008</td>
</tr>
<tr>
<td>White</td>
<td>.047</td>
<td>-.023</td>
<td>-.190</td>
<td>.186</td>
<td></td>
<td></td>
<td>-.239</td>
<td>-.012</td>
<td>--</td>
</tr>
<tr>
<td>Freshman</td>
<td>.027</td>
<td>.100</td>
<td>.0334</td>
<td>-.005</td>
<td>.062</td>
<td></td>
<td>.720</td>
<td>.040</td>
<td>--</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intercept = 34.983</td>
</tr>
</tbody>
</table>

$M$ = 34.84, $SD = 8.33$

$R^2 = 0.060^{*}$

Adj. $R^2 = 0.051$

$R = 0.246^{***}$

*$p < .05$  **$p < .001$  "Unique variability = .034; shared variability = .026"
Multicollinearity was again assessed using variance inflation factors (VIF). The VIF levels for the independent variables of healthy, athletes, female, white, and freshman were 1.33, 1.26, 1.06, 1.02, and 1.07, respectively. These results indicated that multicollinearity was not an issue with the independent variables in this solution.

Linearity, normality and homoscedasticity of residuals were examined through plots of residuals. Figure 4.1 shows a histogram of residuals with a normal curve overlay. The residuals generally take the shape of a normal curve with a very slight positive skew. The distribution was close enough to normal to be considered not problematic.

![Histogram](image)

*Figure 4.1. Histogram of Stress Scores.*

Figure 4.2 shows a scatterplot of standardized residuals by standardized predicted values and shows a rather symmetrical plot of residuals and predicted values thereby indicating that the assumptions of normality, linearity, and homoscedasticity of residuals were met.
Depression Scores.

A standard multiple regression analysis was performed using Depression scores as the dependent variable and healthy living, student-athlete, gender, classification and ethnicity as independent variables. All analyses were performed as discussed above in the stress model. Table 4.5 presents the correlations between all variables, the unstandardized (β) and standardized regression coefficients (β), the semipartial correlations (sr²), the multiple correlation coefficients (R²), and adjusted R². The linear combination of the independent variables were good predictors of Depression scores, $F(5,486) = 4.906, p<.001$. The multiple correlation coefficient ($R^2 = .048$) and adjusted multiple correlation coefficient (Adjusted $R^2 = .038$) indicated that around nearly 5% of variability in Depression scores were explained by the linear relationship of the five independent variables. The variance explained by unique sources is 3.7%, with the amount of shared variability among the five independent variables being 1.1%.

The unstandardized beta weights of the individual variables indicated that only one of the five independent variables have beta weights that are significantly different from zero. The
student-athlete/non-student-athlete beta was significant at the $\alpha<.01$ level ($t=-3.389$, $p<.001$) with a negative weight of $B = -3.479$. Unique variation explained by this variable was less than 2.3% ($sr^2=.023$) making athletic status the strongest predictor of the five independent variables. Given that this variable was coded as 0 for non-student-athlete and 1 for athlete, then student-athlete status of a student decreases predicted Depression score by 3.479 points.

The predictive equation for the set of independent variables and the Stress score dependent variable was:

Depression score = 38.660 + Healthy(-0.195) + Athlete(-3.479) + Female(1.335) + White(-1.583) + Freshman(1.756)

While healthy, gender, white and freshman are all shown in this equation, the beta weights for these variables were statistically equal to zero, therefore, the contribution of these variables to prediction was negligible. These results indicate that healthy living status, gender, ethnicity and whether or not a student was a freshman had no relationship to their reported Depression score. The only variable in this equation that did have a substantial predictive relationship was whether a student was an athlete or not.

Table 4.5

*Standard Multiple Regression: Depression Score*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Depression</th>
<th>Healthy</th>
<th>Athletes</th>
<th>Female</th>
<th>White</th>
<th>Freshman</th>
<th>$B$</th>
<th>$\beta$ (unique)</th>
<th>$sr^2$ (unique)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>.046</td>
<td>.046</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.195</td>
<td>-.006</td>
<td>--</td>
</tr>
<tr>
<td>Athletes</td>
<td>-.186</td>
<td>-.219</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-3.479**</td>
<td>-.173</td>
<td>.023</td>
</tr>
<tr>
<td>Female</td>
<td>.131</td>
<td>.049</td>
<td>-.441</td>
<td></td>
<td></td>
<td></td>
<td>1.335</td>
<td>.068</td>
<td>--</td>
</tr>
<tr>
<td>White</td>
<td>-.017</td>
<td>-.023</td>
<td>-.190</td>
<td>.186</td>
<td></td>
<td></td>
<td>-1.583</td>
<td>-.068</td>
<td>--</td>
</tr>
<tr>
<td>Freshman</td>
<td>.073</td>
<td>-.100</td>
<td>.034</td>
<td>-.005</td>
<td>.062</td>
<td></td>
<td>1.756</td>
<td>.084</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intercept</td>
<td>38.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$M$ = 37.53, $SD$ = 9.60

$R^2 = 0.048^*$, Adj. $R^2 = 0.038$

$*$Unique variability = .023; shared variability = .025

81
Multicollinearity was assessed using variance inflation factors (VIF) computed through the IBM SPSS Statistical software’s regression command. Variance inflation factors are measures of how much variance in the standardized beta weights will inflate for an independent variable if it is totally uncorrelated with the other independent variables. Any inflation factor near 1 is considered a good VIF indicating that the independent variable is not highly correlated with other independent variables. Variance inflation factors levels greater than 10 are considered to be very problematic. The VIF levels for the independent variables of healthy, athletes, female, white, and freshman were 1.33, 1.26, 1.06, 1.02, and 1.07, respectively. These results indicated that multicollinearity was not an issue with the independent variables in this solution.

Linearity, normality and homoscedasticity of residuals were examined through plots of residuals. Figure 4.3 shows a histogram of residuals with a normal curve overlay. The residuals generally take the shape of a normal curve with a very slight positive skew. The distribution was close enough to normal to be considered not problematic.

![Histogram](image)

*Figure 4.3. Histogram of Depression Scores.*
Figure 4.4 shows a scatterplot of standardized residuals by standardized predicted values and shows a rather symmetrical plot of residuals and predicted values thereby indicating that the assumptions of normality, linearity, and homoscedasticity of residuals were met.

Figure 4.4. Scatterplot of Residuals by Predicted Values of Depression.

Summary of Results

The results indicated that both multiple linear regression models were significant. This demonstrates that stress and depression scores can be predicted based on the independent variables used. However, only gender and athletic involvement were significant contributors to the model for stress. Only athletic involvement was a significant contributor to the model for depression. Most of the assumptions were met with the exception of sample size for one of the groups, healthy living residents. Violation of this assumption is only important if the variable is found to be non-significant and this was the case in the current study. Violation of this assumption increases the chance of a type-II error, finding no significance when in-fact significance exists. The succeeding chapter will address the research questions by evaluating the
results and discovering connections from the literature review, discussing limitation of the study and providing recommendations for future research.
CHAPTER 5
DISCUSSION

The purpose of this study was to better understand stress and depression levels of college students and how institutions can assist these individuals by decreasing these levels through various resources. Specifically, the resources evaluated were healthy living factors such as diet, exercise, time management, spiritual development, stress management, and abstention from drugs and alcohol, to name a few. Although much research has been conducted assessing these resources individually, a holistic approach to wellness has not been assessed. The holistic program evaluated was a living-learning community in which students’ partake in multiple wellness programs and live amongst a group of peer participants. The program creators administered the stress and depression assessments during the first semester of the program’s implementation. These students were inundated with resources which focused on the following developmental categories: social, physical, intellectual, cultural, environmental, and spiritual. The researcher desired to evaluate the stress and depression levels of these residents and how these scores differed from student athletes and the normal student population. The want to include student athletes in this model was to assess if stress and depression levels differed between the two groups given the similar resources provided to each. The normal student population was included as a baseline and the sample did not include healthy living residents or student athletes.
Four hundred and ninety two students completed the stress and depression assessment tool in its entirety. The assessment tool chosen was created by Polar™ TriFIT, and includes 157 questions on the following 8 topics: heart disease risk, cancer risk, diabetes risk, prevention issues, stress assessment (State-Trait Anxiety Inventory), depression assessment (Beck Depression Inventory-II), nutrition habits, and safety issues (Polar, 2011). The two sections of interests for the current study were the stress assessment and depression assessment portions of the tool. The 492 undergraduate student sample provided the researcher with an adequate representation of each independent variable: healthy living residents, student athletes, general student; with gender (Female/Male), minority (Minority/Non-Minority), and classification (Freshman/Non-Freshman) being adequately represented within each group. The stress scores for each respondent were aggregated, after some items were reversed scored. The depression scores were calculated using the same overall scoring method. The descriptive statistics of the three groups (healthy living, student athletes, and general student) resulted in an average stress score of 34.8 overall. The possible range for the stress assessment was 19 (exhibiting no stress) to 76 (exhibiting the most stress). The student athletes reported the lowest stress scores, with the general student population reporting the highest scores of the three groups. The descriptive analysis of depression scores yielded similar results. The average depression score for all groups was 37.5. The possible range for the stress assessment was 20 (exhibiting no depression) to 80 (exhibiting the most depression). Surprisingly, healthy living residents reported the highest depression scores of the three groups, with student athletes reporting the lowest. However, it should be noted that the difference between the healthy living residents and the general student population was .2.
Additional inferential analyses were performed. The investigation examined a hypothetical model in which stress and depression levels could be predicted based on these variables: living environment, athletic involvement, gender (Female/Male), ethnicity (Minority/Non-Minority), and classification (Freshman/Non-Freshman). The independent variables of ethnicity and classification were grouped into the following categories. The ethnicity of a respondent was either non-minority or minority; the minority category was aggregated with all minority representation due to a lack of sufficient data for each category. The classification variable was defined as either a freshman or other. The other category was created due to the lack of adequate representation of the other classifications. Two multiple linear regression models were used to evaluate if the hypothesized variables would significantly contribute to stress and depression levels of undergraduate college students. In conducting a linear multiple regression many assumptions must be met to ensure an accurate modeling of the data. The analysis of these assumptions did in fact conclude that all were met. The assumptions tested were as follows, adequate sample size, outlier analysis, absence of multicollinearity, and that the distribution of residuals of the final model are normally distributed, linear, and homoscedastic.

In the determination of an adequate sample size it was found that the overall sample size of 492 was accurate with an effect size of .35 (Tabachnik & Fidell, 2007). However, in evaluating the sample size of each predictor variable it has been recommended that each predictor represent 10% of the overall sample (Rummel, 1970). All of the predictors met this recommendation with the exception of one, healthy living residents (n=40). The group needed a sample of 49 to meet the 10% recommendation. However, the issue lies with the chance of making a type II error, in that there may be significance when none is found. Given the proximity to the proximity to the 10% rule (the healthy living residents represented 8.1% of the
sample), the importance of the variable to the model, and the evidence of the descriptive analysis in that healthy living residents overall scores were not that much different from the general student population, and in one instance exceeded the depression scores of the general student population, the variable was included in the model.

Univariate outliers for dichotomous variables were assessed using Rummel’s (1970) suggestion that any dichotomous variable with a 90% to 10% split or worse should be considered for removal due to the truncation of correlation coefficients within these categories. In assessing the variables in this analysis for dichotomous outliers, gender has a 62.0% to 38.0% male to female split and should remain in the analysis. Ethnicity has a 78.3% to 21.7% split and should remain as well. The classification variable demonstrated a 29.7% to 70.3% split and therefore should remain. The dichotomous athlete variable result in a 35.2% to 64.8% split and meets the requirements. The healthy living variable shows cause for concern with its 8.1% to 91.9% split as it is on the verge of acceptable but not quite. Given the proximity to the acceptable limit and the importance of this variable it remained in the analysis. There were a few outliers in regards to the continuous variable of depression and stress scores. The identified outliers using standardized z-scores were excluded from the analysis. The multivariate outlier analysis was conducted using the Mahalanobis distance formula (Tabachnik & Fidell, 2007). The critical value for the Mahalanobis distances were found to be 18.58, which is the critical $\chi^2$ value at an $\alpha=.001$ with five degrees of freedom. The largest distance found for stress and depression was 18.57. None of these distances met the threshold for exclusion so all remaining cases are retained for analyses.

The multicollinearity was assessed using variance inflation factors (VIF). Any inflation factor near 1 is considered a good VIF indicating that the independent variable is not highly correlated with other independent variables. Variance inflation factors (VIF) levels greater than
10 are considered to be very problematic. The VIF levels for the independent variables of healthy, athletes, female, white, and freshman were 1.33, 1.26, 1.06, 1.02, and 1.07, respectively. These results indicated that multicollinearity was not an issue with the independent variables in this solution. The remaining assumptions (linearity, normality, and homoscedasticity) were tested through the examination of a scatterplot and histogram of the residuals of both stress and depression levels. The histograms and scatterplots both demonstrated a symmetrical plot or residuals that represented a normal curve thereby indicating that the assumptions of normality, linearity, and homoscedasticity of residuals were met.

The researcher hypothesized that all of these factors would significantly contribute to the prediction model. Furthermore, the conceptual framework focused on healthy living residents exhibiting the greatest significance to the model, and that students residing in a healthy living residence hall would demonstrate significantly lower stress and depression scores when compared to their peers. The research questions and null hypotheses for the study are below:

1. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of stress in undergraduate students attending a four-year institution?
2. Does the linear combination of environment, gender, ethnicity, and classification serve as strong predictors of depression in undergraduate students attending a four-year institution?

The results did not support the researcher’s hypotheses in regards to the healthy living residents and their significant contribution to the model. However, the researcher’s hypothesis involving the significance of athletes and gender to the model was substantiated for the dependent variable of stress; with student athletes being a significant predictor to the dependent variable of depression, as well. The results indicated that both multiple linear regression models were
significant. This demonstrates that stress and depression scores can be predicted based on the independent variables used. However, only gender and athletic involvement were significant contributors to the stress model, while athletic involvement was the only significant predictor in the depression model. The discussion of these results will clarify the significance of these findings, consider practical implications for practitioners, examine the limitations of the study, and will present recommendations for future research.

**Discussion of Results**

The results demonstrate that both multiple linear regressions were significant for stress and depression. However, not all variables significantly contributed to the models. Of the five variables only two significantly contributed to the regression model for predicting stress levels, gender and athletic status. However, the regression model predicting depression scores only found athletic status as a significant predictor. The difference in the findings is further substantiated given that past research states that males and student athletes report lower stress and depression scores than their complements (Hudd, Dumlao, Erdmann-Sager, Murray, Phan, Soukas, & Yokozuka, 2000). Furthermore, Astin’s (1993) in depth analysis of the psychological differences of male and female college students concur with these findings, as well. From his research he found that females come into the university with a higher proclivity to stress and depression than males. Astin’s longitudinal study found this to continue throughout their college career, with females reporting elevated stress and depression levels when compared to males. Females on the stress assessment scored on average 3.1 points higher than their male counterparts and 2.6 point higher on the depression assessment but the depression difference was not statistically significant.
The lack of significance found for both classification and ethnicity were surprising. The literature points to a multitude of findings related to elevated stress and depression levels of freshmen (Schlossberg, 1989; Towbes & Cohen, 1996; D’Zurilla & Sheedy, 1991; Pritchard, Milligan, Elgin, Rush, & Shea, 2007; Britz and Pappas, 2010). Although the freshmen respondents scored higher on both assessment tools (.5 on stress; 1.5 on depression) when compared to their peers this finding was not found to be significant. However, the freshman to non-freshman disparity on the depression scale approached significance at the .06 level. The same can be said for the white/minority variable. White students scored .9 points higher than minority students on the stress tool with the reverse being true on the depression scale with minority students scoring .41 points higher than whites. Again, these differences were miniscule and did not significantly contribute to the model. These findings may be attributed to the low response rate of certain groups (males, freshman, and minorities).

The result of the healthy living residents not being a significant contributor to the model was unexpected. These residents were found not to exhibit differing stress or depression scores when compared to the general student population. Given the literature findings of chapter two pertaining to the positive impact of these particular resources on student success and how students who partake in these resources typically exhibit lower stress and depression scores when compared to their peers, the researcher finds these results unexpected (Astin, 1993; Britz & Pappas, 2010; Broughman, Zail, Mendoza, & Miller, 2009; Cohen, 1992; Cohen, 2004; Cohen, Kessler, & Gordon, 1997; D’Zurilla & Sheedy, 1991; Economos, Hildebrandt, & Hyatt, 2008; Friedlander, Reid, Shupak, & Cribbie, 2007). However, the contrary results of the hypothesis concerning healthy living residents may be found in the literature which finds students can be too involved and an abundance of resources may prove overwhelming as opposed to helpful (Astin,
Astin (1999) states there are, “limits beyond which increasing involvement ceases to produce desirable results and can even become counterproductive” (p. 528). The established healthy living residence hall in question may have been too overwhelming for students. Furthermore, the program may have not been well-defined as to what healthy living is or the administrators of the program may have been unsupportive and/or inconsistent in the enforcement of the requirements of the program. Researchers have found that increased involvement in student organizations and clubs can take away from academic interests, thus affecting students’ grades (Black, 2002; MacKinnon-Slaney, 1993). Furthermore, demonstrated in Chapter 2, difficulty with academic interests and low grades have a direct correlation with high stress levels experienced by college students (Towbes & Cohen, 1996; Broughman, Zail, Mendoza, and Miller, 2009; Britz & Papas, 2010; DSM-5, 2013; Finn, 1996; Hudd, Dumlao, Erdmann-Sager, Murray, Phan, Soukas, & Yokozuka, 2000; Liu & Liu, 2000; Miller & Divin, 2008). The level of involvement needs to be evaluated in future research to further substantiate the researcher’s claim.

Although Astin (1974) found that the residency status of a student was positively correlated to academic success, the holistic approach to wellness while living on campus may prove too much for the student. It is interesting to note that the mean scores on the two assessment tools provided some illuminating results. Student athletes reported the lowest scores on the stress scale (range of 19 -76) with a mean of 32.4, with healthy living residents scoring a 34.9 and the general student population with a mean score of 36.4. In regards to stress levels the researcher’s hypothesis substantiated in that student athletes did in fact exhibit lower stress scores than the other two groups, while healthy living residents would score lower than the general student population. However, these findings in relation to healthy living residents were
not significant. The depression scores (range of 20 – 80) indicated student athletes once again had the lowest mean score at 35.1, with the general student population reporting a mean score of 38.8, and the healthy living residents reporting the highest depression value at 39. Although, the difference between the general and the healthy living is insignificant, the results are surprising. Another rationalization to these findings may be the low sample size of the healthy living residents. The demographic questions were situated at the end of this lengthy survey and not all respondents completed that portion. Given the importance of these demographic variables to the model, many of these responses had to be discarded, leaving the researcher with a less than ample healthy living sample of 40 residents.

Summary Statement

Given the apparent lack of literature as it relates to a holistic approach to student success, this study should shed some needed light on these programs and their impact on student success as it relates to stress and depression levels of college students. Many conclusions can be derived from these results that merit consideration by student affairs personnel and university administrators. This study evaluated a newly developed living-learning residence hall that focused on wellness. The findings failed to reliably predict that healthy living residency status had a significantly positive effect on stress and depression levels of college students. However, these students did exhibit lower stress scores when compared to their peers, just not at the significant level needed to adequately contribute to the model. Although the reasons for these findings are not completely evident, the most likely explanation is that these students may have been overwhelmed with the holistic program. The program may have had too many requirements and obligations placed upon the student that they began to feel overwhelmed rather than capable. If this is rationale is correct then the surprising findings suggest, as Astin (1993) states, that
developers of new student-centered programs need to consider the sizeable commitment demanded of students and if this will affect their academic pursuits in a positive or negative way. An additional explanation of the findings may be related to the disproportionate sample size of the groups: gender, ethnicity and classification within each environment (healthy living, athletics, general student). An adequate representation of these groups with each environment may have demonstrated different results. Additionally, future research must place emphasis on how much is too much in regards to student involvement.

Implications for Future Research

The current topic, in the researcher’s opinion, does justify further investigation. However, numerous additional inquiries need to be made. The researcher realizes the significance of a qualitative study in regards to stress and depression levels as it relates to healthy living residents. Additionally, a comparative study of programs with differing intensity levels needs to be assessed. The last suggestion involves an initial assessment of the students who choose to participate in these programs and possibly control for certain input variables that may be affected the outcome of these results when comparing groups. While some of the findings here do support the findings of a number of studies regarding stress and depression levels as well as healthy living options being positively correlated to student success, the major finding within this study does not find a significant relationship regarding on-campus residency and student success, as it relates to affective skill development (Astin, 1993; Kuh, 2003; Pascarella & Blimling, 1996).

The literature concerning healthy living residence halls as a holistic approach to student success needs to be evaluated in more detail. The researcher suggests a qualitative study in which these residents are asked to keep journals while paying special attention to their stress levels throughout the days and weeks. Journaling has proven to be a stress reducer in helping students
reflect internally and assess the world around them (Hampton & Morrow, 2003). Additionally, in the creation of a new holistic wellness program such as this it is very important to accept feedback from these individuals. Through their journaling it is theorized that their evaluation of the program would be apparent through their discussion of various obligations to the program and how these responsibilities compete with academic and emotional demands. Once these journal entries are reviewed the program designers can reevaluate the program and make changes where appropriate to ensure that the student is getting a positive result from the program. Furthermore, it is believed that a mixed-methods approach may prove beneficial as well, in that these same students are given monthly stress assessments to gauge their stress levels throughout the semester. This approach would give a more detailed view of these students from both an academic and emotional perspective. The newly designed program should re-evaluate and implement new outcomes and procedures in order to demonstrate continuous improvement by ensuring the program is meeting the needs of the student.

Additionally, using techniques similar to this study it would be possible and beneficial to perform analyses of other less inclusive programs to determine the level of involvement that is optimal for student success. A comparative study evaluating many different programs with differing levels of involvement could be a valuable contribution to the literature. The research seems to show that involvement is important, but then demonstrates that too much can negatively impact success (Astin, 1993). The line is blurred and research should be conducted to assess where student involvement may begin to negatively impact student success (Hernandez et al., 1999). Huang and Chang, 2004 conducted a similar study in Taiwan. Their research question evaluated the best combination of academic work and student club/organization involvement for student growth. The results indicate that there is no limit to student involvement that negatively
impacts student growth. However, this study was performed in Taiwan and these results should not be generalized to the United States due to cultural differences. The Taiwanese researchers suggest that a similar study be completed in the United States to evaluate if these findings are similar. Contrary to these findings, Whitla (1981) found that students realize more value from a moderate level of involvement than from high or low levels of involvement. The law of diminishing returns, as it relates to the current study, suggests that as hours spent working within the holistic living-learning environment increase the perceived benefit, as it relates to student success, decreases (AMOSWeb, 2014). Additional research would assist in clarifying the differences between these findings and to evaluate if the law of diminishing returns does in fact apply to student involvement.

Also, an interesting question, in respect to Astin’s Input-Environment-Outcome (I-E-O) Model (1984), relates to these healthy living residents who choose to partake in these programs. Are they coming into the program with differing inputs than their peers? Are they more studious at onset? Are they more religious? Do they tend to be more reserved? Do they exhibit higher stress and depression levels before college than their peers? Maybe it can be found that these residents actually had considerably elevated stress scores upon entering college when compared to their peers and found that through the program these levels were actually lessened. Providing a baseline of information before they begin college would prove beneficial for all three groups (healthy living residents, athletes, and the general student population). Once the baseline is established then these pre-college stress scores could be controlled and a more accurate picture of these differences may be established. The researcher in conducting a literature review could find no evidence of this type of study being conducted.
Implications for Practice

The implications of this research are directed toward student affairs personnel and upper level administrators on college campuses in their development of student organizations and programs in ensuring that students are receiving the best combination of resources without being overwhelmed by them. The results of this study indicated that participation in an all-inclusive living wellness program does not lower stress and depression levels when compared to those who do not participate in such a program. Developers of these programs should understand that most of these students attend college to earn a degree. Creating too many requirements for certain programs may have adverse side effects.

As was discussed in Chapter 2, one of the major stressors placed upon college students is time management (Britz & Pappas, 2010; Broughman, Zail, Mendoza, and Miller, 2009; D'Zurilla & Sheedy, 1991; Pritchard, Milligan, Elgin, Rush, & Shea, 2007; Towbes & Cohen, 1996; Wilcox, Winn, & Fyvie-Gauld, 2006). The students evaluated in these past studies did not feel as though they had enough time to complete their assignments, social obligations, and personal concerns. The students who participated in this healthy living environment may have felt too overwhelmed with all of the program requirements and, thus, the outcome actually increased stress rather than decreasing. Practitioners should be aware of their program participants’ grades, emotional well-being, and overall opinion of the program.

Once these variables are considered, the program should be continuously improved to ensure students are reaching their full potential. The healthy living residence hall assessed in this study mandates that all participants abstain from alcohol and drugs, attend time management and study skills workshops, attend spiritual development seminars, partake in food and exercise journaling, participate in social activities, abide by curfews, and observe noise regulations. This
seemingly intense regimen may prove too difficult for students to manage. The recommendation of the researcher is for healthy living program developers to focus on a couple of these areas and leave the other resources as options for the students to participate, if they so desire.

**Relationship of Results to Theory**

The literature is abundant concerning the topic of stress and depression as experienced by college students (Britz and Pappas, 2010; Broughman, Zail, Mendoza, and Miller, 2009; D'Zurilla & Sheedy, 1991; Friedlander, Reid, Shupak, & Cribbie, 2007; Humphrey, 2003; Towbes & Cohen, 1996; Pritchard, Milligan, Elgin, Rush, & Shea, 2007; Wilcox, Winn, & Fyvie-Gauld, 2006). All of the research infers that stress levels increase once a student enters college. These stressors faced by college students can affect them academically, socially, and physically (Britz & Papas, 2010; Crombie, Ilich, Dutton, Panton, & Abood, 2009; Hudd et al., 2000). The success of the student depends on their coping skills during stressful times and ensuring that they improve academically, socially, and emotionally over their college career.

Astin (1984) found a positive relationship between student involvement and student success, as it relates to affective skills. The current study substantiated these findings as it relates to the student athlete. The student athletes were found to report significantly lower stress and depression scores when compared to those college students who do not participate in college athletics. Astin’s (1984) research found that student athletes indicate a greater satisfaction with the academic reputation of the institution in which they attend, the overall intellectual environment, the development of their friendships with other students, and the administration of the institution. This ‘connection’ with the institution is found in many areas of research concerning student development and success (Astin, 1991; Chickering & Reisser, 1993; Kuh et al., 1991; Pascarella & Terenzini, 2005).
The interesting finding regarding the researcher’s hypothesis was the assumption that it was presumed that the healthy living environment was similar to that of a student athlete, in that the participants both receive similar institutional resources. However, the correlation was not obtained. The results demonstrated that healthy living residents at the studied institution reported scores similar to that of the general student population as opposed to student athletes. The literature supports that student athletes exhibit lower stress and depression scores when compared to their non-athletic counterparts (Proctor & Boan-Lenzo, 2010). Proctor and Boan-Lenzo (2010) found the student athletes daily routine to be one of the most stressful of all college students. However, they believe these student athletes have the proper coping mechanisms in place to handle these stressors before they escalate. Furthermore, Greenberg’s (2009) discussions of eustress (good stress) could be the type of stress most experienced by college athletes. These students are used to performing under pressure and the stressors they face are used as a springboard for enhanced performance and personal growth (Sanchis-Gomar et al., 2012; Trail, Robinson, Dick, & Gillentine, 2003; Wann, Schrader, & Wilson, 1999). These findings, in regards to student athletes, do in fact reinforce Astin’s student development theory of student involvement.

The additional predictor used focused on healthy living residents. The conceptual framework created by the researcher for this study was as follows (figure 5.1).
The researcher hypothesized that healthy living residents, through their utilization of the SPICES model of wellness, would demonstrate decreases in stress and depression levels when compared to those who did not participate in the program (athletes excluded). The researcher considered the work of Astin in the creation of the model. Given Astin’s (1984) research on the benefits of student involvement, in particular those residing on-campus, the researcher hypothesized that the healthy living students would indeed exhibit lower stress and depression scores given their on-campus residency and their institutional involvement, which was mandated by the program. The model was further endorsed by Astin’s discovery that student involvement is directly correlated with student success in a multitude of areas: retention, graduating with honors, enrolling in graduate school, increases in standardized test scores, interaction with faculty and staff, development of student relationships, institutional status, and all self-reported increases in cognitive and affective skills (Astin, 1970).

Student who report success in these areas have shown a negative relationship to stress and depression. The research is abundant in demonstrating that when an individuals academic, social, and personal lives are reported as ‘going well’ they further state decreases in stress and depression levels (Britz & Pappas, 2010; Cohen, 2004; Cohen & Wills, 1985; D’Zurilla &
Sheedy, 1991; Friedlander, Reid, Shupak, & Cribbie, 2007; Garlow et al., 2008; Graunke & Woosley, 2005; Hammen & Cochran, 1981; Jy, 2010; Kisch, Leino, & Silverman, 2000; Mahoney, Caims, & Farmer, 2003; Nordstrom, & Hiester, 2008; Ross, Niebling, & Heckert, 1999; Swenson.; Towbes & Cohen, 1996; Stevens, Loudon, Yow, Humphrey, & Bowden, 2013; Wilcox, Winn, & Fyvie-Gauld, 2006; Zhao & Kuh, 2004). Therefore, it was hypothesized by the researcher that this program, which required substantial involvement by the student, would also show a decrease in the individuals’ affective skills, mainly stress and depression, as discussed by Astin (1970).

As the results demonstrated this was not the case. The healthy living students in the study exhibited stress and depression scores similar to those who did not participate in the program. The researcher has three conclusions in regards to this finding. First, the sample may have needed to be larger for the healthy living residents. There could have, indeed, been significance when none was found given the small sample size; a type II error may have occurred. Secondly, the program was in its infancy and may have overextended its capabilities. Given more time to work out some of the kinks, future students may have benefitted more from this program. Lastly, Astin’s remark that, “… there are probably limits beyond which increasing involvement ceases to produce desirable results and can even become counterproductive” (Astin, 1999, p. 528). The students may have been overwhelmed with the program and, instead of reducing stress levels, they maintained or elevated them.

The researcher posits that the program in question was overwhelming to the participants. The program developers may have been too eager in the creating of the programs’ obligations and, thus, the law of diminishing returns was the ultimate outcome. The revised conceptual framework (Figure 5.2) based on these findings is below.
Figure 5.2. Revised Conceptual Framework.

The revised framework demonstrates that as these healthy living residents are inundated with obligations related to each of the areas within the spices model this ultimately produces a diminishing marginal return, as represented by the D. The diminishing marginal returns formula is defined as such:

\[ D = \frac{1}{X} \sum_{i=1}^{X} \frac{1}{2^{i-1}} \]

In regards to the current research this formula can be broken down into the following components. Where \( X \) = hours spent working within the housing program (e.g. maintaining logs, maintaining healthy eating habits, attending workshops, study hall, etc.), and \( \frac{1}{2^{i-1}} \) = additional perceived benefit (based on the cumulative Likert score for each assessment), for the \( i \)th hour of the student working within the housing program. The last piece of the framework indicates that when the obligations are too overwhelming and the law of diminishing returns is in fact present then stress and depression levels are either maintained, as compared to the normal student population or they are actually increased due to the demands of the program. Additionally, there are some shortcomings to the research study, which will be discussed at length in the following section.
Limitations of the Study

As with all studies of social science, there are limitations to the discussed research study. Primarily, the sample size for the healthy living sample is low. Rummel (1970), suggested that any categorical variable not represented by at least 10% of the sample should be eliminated. This suggestion is given because there is not enough variability surrounding the variable to be detected. In other words, if the healthy living residents exhibited lower stress scores than their counterparts, there would not be enough statistical power to identify it as being significant. This implies that healthy living residents could have, in fact, had significantly lower stress scores, but given the small sample size, a type II error occurred. A type II error occurs when a significant difference does in fact exist but none was found, a false negative, so to speak. The cause of the small sample size was a lack in response to the demographic questions placed at the end of the survey. The survey design is an additional limitation to this research. The survey designers chose to place demographic questions at the end of the lengthy 147 question instrument. Many individuals did not complete the entire survey. Since these demographic questions were placed at the end, many of the needed variables such as gender, ethnicity, and classification were left blank. Given the need of these fields to be answered in order to properly run a multiple linear regression analysis, the respondents who left these questions blank had to be deleted from the dataset. In future research endeavors, all demographic questions should be placed at the front of the survey to ensure completion.

The length of the survey itself was another limitation. The instrument consists of 9 sections. In future administrations of the instrument it would be beneficial to parse out the stress and depression sections, as to not overwhelm the respondent with the other 108 questions. Also, providing an incentive for survey participation would be another way of increasing the sample
size. Furthermore, the survey was administered to the general student population via an online survey tool named SurveyMonkey. In administering a survey in this format there is selection bias, in that the ‘sample’ is not random. Also, in online administrations the environment cannot be controlled by the researcher. A certain demographic is targeted in this type of sample selection as well. In this case, college students, primarily white, female, upper-middle class individuals. The student athletes and healthy living residents were sampled using a paper/pencil version of the assessment tool. The differing methods of administration were a limitation to the consistency of the study (Wood, Nosko, Desmarais, Ross, & Irvine, 2006). However, the desire to answer these personal questions, regardless of administration method used, in a socially desirable way needs to be acknowledged. In other words the respondents may not have been honest in their responses but answered the questions untruthfully in order to avoid the personal stigma associated with mental illness.

The current study was conducted at a regional 4-year public institution located in a rural area of the southeastern region of the United States and therefore cannot be generalized to other regions or institutional types due to differences associated among students and the population at large who occupy these areas or institutions. Future studies could focus on 2-year vs. 4-year, public vs. private, religious and Historically Black Colleges and Universities (HBCU) in distinguishing differences between institutional types. Furthermore, the study needs to be expanded outside of the southeastern region of the United States to get a more accurate picture of the nation at large.

Conclusions

In summary, this study was intended to identify predictors (environment, athletics, gender, ethnicity, classification) that could be used in assessing a student’s stress and depression
levels while attending college. The study tested a conceptual framework model designed by the researcher in which healthy living residents who participated in a holistic program of wellness would demonstrate decreases in stress and depression levels. The hypothesized model was tested and did not statistically support the theorized framework. However, the results, located in Chapter 4, indicated that both multiple linear regression models were significant. This demonstrates that stress and depression scores can be predicted based on the independent variables used. Nevertheless, the only two predictor variables that significantly contributed to the stress model were gender and athletic status with only athletic status significantly contributing to the depression model. The student athletes reported significantly lower stress and depression levels when compared to those who do not participate in collegiate athletics. This finding coincides with past research regarding student athlete’s low reported stress and depression levels (Proctor & Boan-Lenzo, 2010). In regards to gender, females reported significantly higher stress and depression scores when compared to males. This finding also complements the existing literature (Astin, 1993; Hudd, et al., 2000). Astin states that women come into the university with a higher proclivity to stress and depression when compared to males and this trend continues throughout their college journey.

Although the findings conflicted with the researcher’s hypothesis they were not all that surprising. The healthy living students in question were too inundated with the obligations of the program. Given the findings of Hernandez and his colleagues (1999), Huang and Chang (2004), Astin (1993), and Whitla (1981) there may be a point when too much student involvement begets negative outcomes, more specifically as it relates the students’ affective development. The law of diminishing returns needs to be considered in program development. In the present study it is evident that the creators of the programs were eager to assists students in all areas of their
development. The holistic approach is not necessarily a damaging approach to student success but there is evidence, given the current study, of a line of demarcation where the obligations placed upon students by the program cause a decline in the students’ mental capacity to handle all of their responsibilities while attending college. This conclusion definitely deserves more attention in future research. Potential research concerning this topic should attempt to define where this point of diminishing marginal return begins and what the optimal level of student involvement is in lowering stress and depression levels of undergraduate college students.
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APPENDIX A.

Health Risk Appraisal
Life House Project Questionnaire

Heart Disease

1. Have you been diagnosed with heart disease?
   a. Yes
   b. No

2. Has a parent, brother or sister ever been diagnosed with heart disease?
   a. Yes
   b. No

3. Have you been told by your doctor that you have diabetes?
   a. Yes
   b. No

4. How often do you engage in aerobic exercises (walking, jogging, biking, etc.)?
   a. Rarely or never
   b. 1 or 2 times each week
   c. 3 or more times each week

5. Are you currently taking anti-hypertensive medications?
   a. Yes
   b. No

6. What is your current cigarette smoking habit?
   a. I do not smoke cigarettes
   b. Smoke less than a pack a day
   c. Smoke about a pack a day
   d. Smoke two or more packs a day
   e. I do not smoke cigarettes, but I use other tobacco products

7. Which statement best describes your blood pressure?
   a. Normal or low
   b. Borderline high
   c. High
   d. I'm not sure

8. Which statement best describes your total cholesterol?
   a. Normal or low
   b. Borderline high
   c. High
   d. I'm not sure

9. Which statement best describes your HDL cholesterol ("good cholesterol")?
   a. Low (Bad)
   b. Borderline Low
   c. High (Good)
   d. I'm not sure
Cancer

10. Have you been exposed to any of the following?
   a. Mining
   b. Asbestos
   c. Uranium and radioactive products
   d. None of the above

11. Do you use tobacco products?
   a. Yes
   b. No

12. What tobacco products do you use?
   a. Cigarette or little cigars
   b. Pipe and/or cigar, but not cigarettes
   c. Smokeless tobacco
   d. Nonsmoker

13. How many cigarettes do you smoke per day?
   a. 0
   b. Less than ½ pack per day
   c. ½ pack to 1 pack
   d. 1 pack to 2 packs
   e. 2+ packs

14. What type of cigarettes do you smoke?
   a. High tar/nicotine
   b. Medium tar/nicotine
   c. Low tar/nicotine
   d. Nonsmoker

15. How long have you used tobacco products?
   a. Nonsmoker
   b. Up to 15 years
   c. 15 to 25 years
   d. 25+ years

16. I am stopping use of tobacco products today.
   a. Yes
   b. No
   c. Not applicable

17. Has anyone in your family had any of the following?
   a. Colon cancer
   b. Colon polyps
   c. Neither

18. Have you ever had any of the following?
   a. Colon cancer
   b. Colon polyps
   c. Ulcerative colitis for more than seven years
   d. Cancer of the breast, or ovary
   e. None of the above
19. Do you have bleeding from the rectum?
   a. Yes
   b. No

20. Have you had a change in bowel habits (such as altered frequency, size consistency, or color of stool)?
   a. Yes
   b. No

21. I have altered my diet to contain less fat and more fruits, fibers, and cruciferous vegetables (broccoli, cabbage, cauliflower, brussell sprouts).
   a. Yes
   b. No

22. Have you tested for blood in your stool within the past year?
   a. I have had a negative exam.
   b. I have had a positive exam.
   c. I have not had a test for blood in my stool in the past year.

23. Have you tested for colon cancer and polyps within the past year (procosigmoidoscopy, barium enema x-rays).
   a. I have had a negative exam.
   b. I have had a positive exam.
   c. I have not had a test for colon cancer and polyps in the past year.

24. Do you live in the southern part of the United States?
   a. Yes
   b. No

25. Do you frequently work or play in the sun?
   a. Yes
   b. No

26. Do you have a fair complexion or freckles (natural hair color of blonde, red or light brown, or eye color of grey, green, blue, or hazel)?
   a. Yes
   b. No

27. Do you work in mines, around coal tars or radioactivity?
   a. Yes
   b. No

28. Did you experience severe, blistering sunburn before the age of 18?
   a. Yes
   b. No

29. Do you have any family members with skin cancer or a history of melanoma?
   a. Yes
   b. No

30. Have you had skin cancer or melanoma in the past?
   a. Yes
   b. No
11. Do you use or have you used tanning beds or sun lamps?
   a. Yes
   b. No

12. Do you have any large, many, or changing moles?
   a. Yes
   b. No

33. I cover up with a wide-brimmed hat and wear long-sleeved shirts and pants.
   a. Yes
   b. No

34. I use sunscreens with a SPF rating of 15 or higher when going out in the sun.
   a. Yes
   b. No

35. I examine my skin once a month for changes in warts or moles.
   a. Yes
   b. No

36. My race is?
   a. Asian
   b. Hispanic
   c. Black
   d. White
   e. Other

**Questions 37 – 46 could be considered gender specific, answer accordingly**

37. Do you have a family history of breast cancer?
   a. None
   b. Mother, sister, daughter with breast cancer

38. Do you have a history of breast cancer?
   a. No breast disease
   b. Previous lumps or cysts
   c. Previous breast cancer

   a. 1st pregnancy before age 30
   b. 1st pregnancy at age 30 or older
   c. No pregnancies

40. Do you practice breast self-examination monthly?
   a. Yes
   b. No

41. Your mammogram exam.
   a. I have had a negative mammogram exam.
   b. I have had a positive mammogram exam.
   c. I have not had a mammogram exam.

42. Your number of pregnancies.
   a. 0
   b. 1 to 3
   c. 4 and over
   a. Viral infections of the vagina such as venereal warts, herpes or ulcer formation
   b. None

14. How old were you at first intercourse?
   a. Before age 15
   b. Age 15 to 19
   c. Age 20 to 24
   d. Age 25 and over
   e. Never had intercourse

15. Have you had bleeding between periods or after intercourse?
   a. Yes
   b. No

16. Your history of pap smear and pelvic exam in the past year.
   a. I have had a negative exam.
   b. I have had a positive exam.
   c. I have not had an exam in the past year.

**Diabetes**

47. Have you been diagnosed with diabetes by your physician?
   a. Yes
   b. No

48. I get little or no exercise during a usual day.
   a. Yes
   b. No

49. Have you ever experienced any of the following?
   a. Extreme thirst and urination
   b. Extreme fatigue
   c. Blurry vision from time to time
   d. Unexplained weight loss
   e. None of the above

50. I have a sister or brother with diabetes.
   a. Yes
   b. No

51. I have a parent with diabetes.
   a. Yes
   b. No

52. I am a woman who has had a baby weighing more than nine pounds at birth.
   a. Yes
   b. No
Stress

53. I am "calm, cool", and collected:
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

54. I feel problems are piling up so that I cannot overcome them.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

55. I feel my heart racing or pounding without exercising.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

56. Some unimportant thought runs through my mind and bothers me.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

57. I feel secure and at ease.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

58. I feel I am "losing out" because I can't make up my mind.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

59. I feel dizzy, light-headed, or faint.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

60. I wish I could be as happy as others seem to be.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always
61. I feel joyful and confident.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

62. I feel worried and tense.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

63. I am afraid of people and things.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

64. I have stomach pains or indigestion.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

65. I am inclined to take things hard.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

66. I sleep poorly or have nightmares.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

67. I enjoy sitting quietly.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

68. I feel rushed or hurried.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

69. I get headaches or neck pains.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always
70. I get flushed or sweaty without exercising, or I get hives.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

71. I am eager for new challenges and tasks.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

**Depression**  

72. I feel "blue" or sad.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

73. I feel confident and hopeful about the future.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

74. I feel like a failure.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

75. I don't enjoy things the way I used to.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

76. I feel guilty.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always  

77. I have a feeling something bad may happen to me.  
   a. Almost never  
   b. Sometimes  
   c. Often  
   d. Almost always
8. I am pleased with myself.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

79. I blame myself for everything that goes wrong.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

30. I have crying spells.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

81. I get irritated or annoyed.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

82. I am interested in people and enjoy being with them.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

83. I am unsure of myself and try to avoid decisions.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

84. I feel that I look attractive and healthy.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

85. I sleep poorly and am tired in the morning.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always

86. I am energetic and eager to take on new tasks.
    a. Almost never
    b. Sometimes
    c. Often
    d. Almost always
37. My appetite is not as good as it used to be.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

86. I am as interested in sex as I used to be.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

89. I am concerned about my stomach and my bowels.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

90. I feel healthy.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

91. I have trouble doing my work.
   a. Almost never
   b. Sometimes
   c. Often
   d. Almost always

**Nutrition**

92. How many caffeinated drinks (coffee, tea, coca, soft drinks) do you have in a typical day?
   a. 0
   b. 1 to 2
   c. 3 to 4
   d. 5+

93. How many sugar-free or artificially sweetened beverages do you have in a typical day?
   a. 0
   b. 1 to 2
   c. 3 to 4
   d. 5+

94. How many glasses (8 ounces) of water do you drink in a typical day?
   a. 0 to 3
   b. 4 to 5
   c. 6 to 7
   d. 8+
95. My meat/protein eating habit is.
   a. Eat regular cuts of red meat, hamburger, wiener and lunch meat
   b. Eat a mixture of red meats and some poultry or fish
   c. Eat only lean meats, skinless poultry or fish
   d. Eat very little red meat, mostly white meat (poultry or fish)
   e. Seldom or never eat meat – I eat mostly vegetables

96. My dairy product/egg eating habit is.
   a. Nearly always eat high fat (ice cream, eggs, butter, cheese etc.)
   b. Eat mostly high fat, some low (skim milk, yogurt, egg whites)
   c. Eat both high fat and low fat about the same
   d. Eat primarily low fat products, but some high
   e. Eat only low fat products or none at all

97. My dessert eating habit is.
   a. Nearly always eat high fat (cake, donuts, pies, ice cream etc.)
   b. Eat mostly high fat, some low (fruits, gelatins, home baked)
   c. Eat both high fat and low fat about the same
   d. Eat primarily low fat products, but some high
   e. Eat only low fat products or none at all

98. My cooking fats/food preparation is.
   a. Nearly always cook/eat high fat (fry, shortening, butter creams)
   b. Cook/eat food mostly the high fat way
   c. Food cooked both high and low fat (broil, bake, boil, no added fat)
   d. Food cooked primarily the low fat way
   e. Food prepared only the low fat way

99. My bread/grain eating habit is.
   a. Nearly always eat refined (with bread, rolls, crackers, and cereal)
   b. Eat mostly refined grain products
   c. Eat a mixture of refined and whole grain products
   d. Eat primarily whole grain products
   e. Eat only whole grain products

100. My fruit/vegetable eating habit is.
    a. 5 or more servings per day
    b. 4 servings per day
    c. 3 servings per day
    d. 2 servings per day
    e. 1 serving per day

101. My fast food eating habit is.
    a. I eat fast food nearly every day.
    b. I eat fast food several times each week.
    c. I eat fast food a few times each month.
    d. I seldom or never eat fast food

102. My salty food habit is.
    a. I seldom or never eat salty food (chips, pickles, added salt)
    b. Occasionally I eat salty foods
    c. I regularly eat salty food
    d. I frequently eat salty foods – I like salt
103. My breakfast eating habit is.
   a. I eat a rounded breakfast (more than coffee and roll) daily
   b. I eat a rounded breakfast almost every day
   c. I sometimes eat a rounded breakfast
   d. I rarely eat breakfast

104. My high fat snack eating habit is.
   a. I eat high fat snack foods (potato chips) 3 or more times daily
   b. I eat high fat snacks once or twice daily
   c. I eat high fat snacks few times each week
   d. I rarely or never eat high fat snacks

Prevention

105. Do you have a source of professional medical care?
   a. Yes
   b. No

106. Do you feel comfortable discussing health problems with your health care provided?
   a. Yes
   b. No

107. Have you had your vision/hearing checked in the past 5 years?
   a. Yes
   b. No

108. Do you have a rectal exam annually?
   a. Yes
   b. No

109. Have you had your blood pressure checked in the past year?
   a. Yes
   b. No

110. Have you had your blood cholesterol checked in the past year?
    a. Yes
    b. No

111. How often do you have medical checkups?
    a. Never
    b. Only when I'm sick
    c. Every 3 - 5 years
    d. Every 1 - 3 years
    e. Annually

112. Do you wear protective clothing or use sun screen with SPF 15 rating or higher when going out in the sun?
    a. Yes
    b. No

113. Do you examine your skin once a month for changes in warts or moles?
    a. Yes
    b. No
114. How often do you have a pelvic exam including a Pap test?
   a. Once per year
   b. Once every 2 – 3 years
   c. More than 3 years apart
   d. Never
   e. not applicable

115. Do you examine your breasts every month?
   a. Yes
   b. No

116. Have you had your breasts examined in the last year?
   a. Yes
   b. No

117. When was the last mammogram (x-ray) of your breasts?
   a. Never had a mammogram
   b. 2 or more years ago
   c. 1 to 2 years
   d. Within the last year

118. Do you examine your testicles for lumps every month?
   a. Yes
   b. No
   c. not applicable

119. Do you have a rectal and prostate exam annually?
   a. Yes
   b. No
   c. not applicable

Safety

120. How many miles per year do you travel in a car?
   a. Over 25,000 miles
   b. 20,000 to 25,000 miles
   c. 10,000 to 19,999 miles
   d. 5,000 to 9,999 miles
   e. Less than 5,000 miles

121. How often do you wear your seat belt while in a car?
   a. Seldom wear my seat belt
   b. Occasionally
   c. At least half the time
   d. Most of the time
   e. All of the time

122. Do you drive within the speed limit?
   a. Yes, always
   b. Most of the time
   c. Often drive a little over
   d. Often drive more than 5 mph over
   e. Often drive more than 10 mph over
123. Do you ride in a car when the driver is intoxicated?
   a. Never
   b. Seldom
   c. Occasionally, once a month or so

124. I wear a helmet while riding a bike or motorcycle.
   a. Yes
   b. No

125. I store chemical household products/medications out of the reach of children.
   a. Yes
   b. No

126. I store products marked “Danger” or “Poison” in a locked storage area.
   a. Yes
   b. No

127. I store products marked “Flammable” in a shed or lock box outside of my home and garage.
   a. Yes
   b. No

128. I carefully read labels and follow instructions when using chemical household products.
   a. Yes
   b. No

129. I have working smoke detectors on every floor in my home that are checked regularly.
   a. Yes
   b. No

130. I have emergency numbers (doctor, emergency room, poison control, 911) listed on or near each phone in your home.
   a. Yes
   b. No

131. I have a home evacuation plan in case of fire, natural disaster or other emergency.
   a. Yes
   b. No

132. My home evacuation plan is practiced at least every six months.
   a. Yes
   b. No

133. I have a working fire extinguisher in my home.
   a. Yes
   b. No

134. I am trained in CPR and know basic first aid.
   a. Yes
   b. No

135. I know where the gas and water utility valve switches are located for my home and know how to shut them off.
   a. Yes
   b. No
136. Each bathtub and bathroom floor in my home is covered with a non-skid surface or rubber mat.
   a. Yes
   b. No

137. The water heater for my home is set to keep the hot water temperature at 120 degrees F or less, to prevent scalds and burns.
   a. Yes
   b. No
   c. Don’t know

138. Hallways and stairs in my home are well lighted.
   a. Yes
   b. No

139. My home is “smoke-free” – no cigarettes, pipes or cigars are smoked inside.
   a. Yes
   b. No

140. Hallways, doors and stairs in my home are clear of obstacles such as furniture, boxes, toys, electric cords, etc.
   a. Yes
   b. No

141. I practice techniques that will prevent injury from repetitive activities (working on a keyboard, bending over, sitting at a desk).
   a. Yes
   b. No

142. I practice proper lifting techniques (bend my knees and squat close to the load, and rely on my thighs and abdominal muscles to do most of the lifting).
   a. Yes
   b. No

Exercise and Wellness

143. Do you know your blood pressure reading?
   a. Yes
   b. No

144. How many times during a week do you exercise where your heart rate is elevated for at least 20 minutes? (you “break a sweat” or perspire)
   a. None
   b. 1 – 3 times
   c. 4 or more times

145. How many times during a week do you engage in weight training which works upper body and lower body muscle groups?
   a. None
   b. 1 time
   c. 2 – 3
   d. 4 or more times
146. How many times during a week do you engage in stretching exercises where you stretch to the point of mild discomfort and hold the position for 15 – 30 seconds?
   a. none
   b. 1 – 3 times
   c. 4 or more times

147. Do you consider yourself a spiritual person?
   a. Yes
   b. No

Demographics

148. What is your classification?
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior
   e. Other

149. Do you live in an on campus residence hall?
   a. Yes
   b. No

150. Do you live on one of the *Life House Floors* in LaGrange Hall?
   a. Yes
   b. No

151. Are you a member of a Social Greek Organization?  (Either IFC, NPC or NPHC Organization)
   a. Yes
   b. No

152. Are you on a University Varsity Athletic Team?
   a. Yes
   b. No

153. Sex
   a. Male
   b. Female

154. Ethnicity
   a. Caucasian
   b. Black or African American
   c. Hispanic or Latino
   d. Other
   e. Decline to answer

155. Are you a U.S. citizen?
   a. Yes
   b. No

156. Has your body weight changed over the last year?
   a. it has increased by 10 or more pounds
   b. It has decreased by 10 or more pounds
   c. my body weight has not changed by 10 or more pounds over the last year
<table>
<thead>
<tr>
<th>Gender</th>
<th>BMI (Body Mass Index)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>18.5 - 24.9</td>
</tr>
<tr>
<td>Women</td>
<td>18.5 - 24.9</td>
</tr>
</tbody>
</table>

# APPENDIX B.

## Data Dictionary

<table>
<thead>
<tr>
<th>Variable Title</th>
<th>Variable Number</th>
<th>Variable Type</th>
<th>Variable Length</th>
<th>Variable Definition</th>
<th>Valid Codes</th>
<th>Measure</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>001</td>
<td>Numeric</td>
<td>1</td>
<td>Healthy Living Resident Identifier</td>
<td>1: Healthy Living Resident 0: Non-Healthy Living Resident</td>
<td>Nominal</td>
<td>Independent</td>
</tr>
<tr>
<td>Athletes</td>
<td>002</td>
<td>Numeric</td>
<td>1</td>
<td>Athletic Identifier</td>
<td>1: Athlete 0: Non-Athlete</td>
<td>Nominal</td>
<td>Independent</td>
</tr>
<tr>
<td>Class</td>
<td>003</td>
<td>Numeric</td>
<td>1</td>
<td>Class Identifier</td>
<td>1: Freshman 0: Non-Freshman</td>
<td>Nominal</td>
<td>Independent</td>
</tr>
<tr>
<td>Female</td>
<td>004</td>
<td>Numeric</td>
<td>1</td>
<td>Gender Identifier</td>
<td>1: Female 0: Male</td>
<td>Nominal</td>
<td>Independent</td>
</tr>
<tr>
<td>White</td>
<td>005</td>
<td>Numeric</td>
<td>1</td>
<td>Ethnicity Identifier</td>
<td>1: Minority 0: White</td>
<td>Nominal</td>
<td>Independent</td>
</tr>
<tr>
<td>Stress</td>
<td>006</td>
<td>Numeric</td>
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<td>Sum of Stress Assessment</td>
<td>Range 19 – 76</td>
<td>Scale</td>
<td>Dependent</td>
</tr>
<tr>
<td>Depression</td>
<td>007</td>
<td>Numeric</td>
<td>2</td>
<td>Sum of Depression Assessment</td>
<td>Range 20 – 80</td>
<td>Scale</td>
<td>Dependent</td>
</tr>
</tbody>
</table>
APPENDIX C.

IRB Approval for Research

January 22, 2014

Molly J. Vaughn
ELPTS
College of Education
The University of Alabama

Re: IRB # EX-14-CM-015 “Stress and Depression Levels of Undergraduate Students, Healthy Living Residents, and Student Athletes: A Multiple Regression Analysis”

Dear Ms. Vaughn:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your protocol has been given exempt approval according to 45 CFR part 46.101(b)(4) as outlined below:

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Your application will expire on January 21, 2015. If your research will continue beyond this date, complete the relevant portions of Continuing Review and Closure Form. If you wish to modify the application, complete the Modification of an Approved Protocol Form. When the study closes, complete the appropriate portions of FORM: Continuing Review and Closure.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number.

Good luck with your research.