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# A Comparison of Perceived Stress among Undergraduate Nursing, Education, and Engineering Majors

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**SIGNATURE PAGE**

This thesis for honors recognition has been approved for the

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A Comparison of Perceived Stress among Undergraduate  
Nursing, Education, and Engineering Majors

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### **Dedications**

I would like to dedicate this paper to my wonderful family. They have been incredibly supportive during this whole process and I don't think I could ever thank them enough.

### **Abstract**

The physiological and psychological effects of stress can be detrimental to the health and well-being of a college student. The purpose of this study was to examine the perceived stress levels of nursing students and compare those to the perceived stress levels of engineering and education students. This quantitative study consisted of approximately 76 students between the ages of 18-39 attending Carroll College and enrolled in 300 level courses in the nursing, education, and engineering programs (39 nursing, 21 education, and 16 engineering students). The study consisted of 16 male and 60 female participants of different races. The Perceived Stress Scale-10 was utilized to measure the students' perceived stress levels. Results from the study were shown to be statistically significant with a p-value less than .05, with nursing students demonstrating higher perceived stress levels than education and engineering students. Future research includes implementing stress reduction strategies to decrease stress levels in the nursing program.

## CHAPTER I

### Background

Our bodies have evolved over time to react to stressful situations with the reaction known as the “fight or flight” response. This ancient evolutionary adaptation works through the release of hormones, such as adrenalin and glucocorticoids, that instantly increase the heart rate and energy level (Schwartz, 2007). As Robert Sapolsky, professor of biology, neuroscience, and neurosurgery at Stanford University, explains,

“Stress hormones are brilliantly adapted to help you survive an unexpected threat. You mobilize energy in your thigh muscles, you increase your blood pressure and you turn off everything that's not essential to surviving, such as digestion, growth and reproduction. You think more clearly, and certain aspects of learning and memory are enhanced. All of that is spectacularly adapted if you're dealing with an acute physical stressor (Schwartz, 2007).”

However, non-threatening life stressors also have the ability to trigger the release of these hormones in day-to-day life. In the modern world, causes of stress can be everyday events and changes. The transition to college is one major life event that can ignite the stress response. According to a 2008 study conducted by the Associated Press, “Eight in ten college students say they have sometimes or frequently experienced stress in their daily lives in the last three months” (Stress in College, 2015). This stress that students experience can lead to future problems. The purpose of this thesis is to compare the perceived stress levels of undergraduate students in the nursing, education, and engineering majors.



## **Definition**

The term “stress” was originated by Hans Selye in 1936, who defined it as “the non-specific response of the body to an irritant, a perceived danger, or a life threat” (Boyd, 2012). Stress is often difficult to define because it is so different for each of us. Stress is a subjective response, unique to each person and setting, based on the individual’s personality and physiology (Hudd et al, 2000; Tangri, 2003).

This subjective response to stress is defined as “perceived stress”. Perceived stress, according to the Encyclopedia of Behavioral Medicine is, “the feelings or thoughts that an individual has about how much stress they are under at a given point in time or over a given time period” (Gellman & Turner, 2013). Perceived stress is not measuring types of stress or how often stressful events occur to a certain individual, but rather how that individual feels about the stressful event in his or her life and the individual’s ability to handle that stress (Gellman & Turner, 2013). As Gellman states, “Individuals may suffer similar negative life events but appraise the impact or severity of these to different extents as a result of factors such as personality, coping resources, and support” (Gellman & Turner, 2013).

## **Demographics of Stress**

Stress is a biological response that can be experienced at any age and in any culture. Stressful events can occur across the lifespan and affect everyone differently. Historically, women report higher levels of stress than men (Stress and Gender, 2011). Women who report high personal stress have greater odds of being diagnosed with

arthritis, ulcers, asthma, back problems, chronic bronchitis or chronic emphysema (Tangri, 2003). Older adults are less likely than younger generations to report experiencing high levels of stress and are more likely to report successfully coping with the stress they do have (Stress and Generations, 2011).

### **College Students and Stress**

College students are a group particularly prone to stress due to the transitional nature of college (Ross, Niebling & Heckert, 1999). They have to adjust to being away from home, maintain a high level of academic achievement, and adjust to a new social environment (Ross, Niebling & Heckert, 1999). High stress levels have been associated with depression, low self-esteem, poor adjustment to college, lack of social support, and unhealthy and high risk behaviors in college students (Goff, 2011). According to Healthy Campus 2020, “27.4 percent of students reported that stress adversely affected their academic performance in the past 12 months” (American College Health Association, 2012). In a 2007 study conducted by Linda Cook, the top five sources of stress in college students were found to be living in a new place, living in and sharing a confined space, meeting expectations/demands of parents, balancing workload and class schedules with full or part time jobs and other responsibilities, and handling long-distance relationships with significant others (Cook, 2007).

Individuals affected by stress have been found to smoke more, eat more, have more alcohol and drug-related problems, be less motivated, have more trouble with co-workers, and contract more illnesses (Tangri, 2003). All of these issues can create dysfunction in a student attending college. Stress has often been linked with problem drinking among college students (Rice & Arsdale, 2010). Alcohol use is common among

college students and is among the more significant health threats to that population (Butler, Dodge & Faurote, 2010). National surveys show that 40-44% of college students engage in binge drinking (Butler Dodge & Faurote, 2010). Among college students, problem drinking represents the leading cause of death and has been associated with higher rates of sexual assault, and a variety of other health, academic, and interpersonal problems (Rice & Arsdale, 2010).

### **General Effects of Stress**

The body cannot distinguish between physical and psychological threats. Adverse effects of stress can be emotional, psychological, and physical. Long-term exposure to stress can lead to serious health problems like depression, anxiety, fatigue, obesity and has been found to be linked to some of the leading causes of death such as cancer, accidents, cirrhosis, and suicide (Sinha & Jastreboff, 2013). Stress has also been shown to impair the immune system, resulting in more infectious diseases, chronic respiratory illnesses, and gastrointestinal disorders (Tangri, 2003).

Stress is also linked to the development of most major mental health problems, such as depression, PTSD, and anxiety (Marin et al., 2011). According to the World Health Organization, depression, anxiety, and other stress-related mental health conditions will be second only to heart disease in the number of cases by the year 2020 (Kalia, 2002). In 2001, psychotherapeutic drugs accounted for 11.3% of prescriptions dispensed, and 9.8% of hospital and drug store purchases (Tangri, 2003).

Psychotherapeutics are second only to cardiovascular drug prescriptions written by physicians (Tangri, 2003). Recent studies confirm a sharp rise in the number of college students taking psychiatric medication (Young, 2003). Students with higher levels of

psychological distress were characterized by higher test anxiety, lower academic performance, and less effective time management and use of study resources (Kitzrow, 2003). Five percent of college students are unable to complete their education due to psychiatric disorders (Kitzrow, 2003). Depression and anxiety disorders impose considerable burdens on the individual in terms of impairment of daily activities, learning, and relationships (Kalia, 2002). The ability to learn and build relationships are important factors that are needed to succeed in college and if stress goes unmanaged, can be detrimental to a student's college career, happiness, and overall well-being.

### **Impact on Society**

Stress not only has an impact on the individual and those around them, but also greatly impacts the country's economy. Stress-related disorders cost the nation more than 42 billion dollars each year (Kalia, 2002). The American Institute of Stress has determined that, "75% to 90% of all doctor visits are now stress-related" (Kalia, 2002). Since there can be multiple stress responses and stress can be the cause of other diseases, it often leads to misdiagnoses. The misdiagnosis of stress-related disorders, including anxiety, costs the United States billions of dollars every year (Kalia, 2002). Misdiagnosis also leads to multiple visits by patients to try and help alleviate their problems. Studies show that patients suffering from stress-related illnesses are three to five times more likely to visit the doctor and six times more likely to be hospitalized than those who report not to suffer from these illnesses (Kalia, 2002).

For those in college, stress can range from a simple inconvenience to a serious issue. Although the stressful situation is occurring during the college years, the effects can be felt long after the stress has passed. Since stress is the most common underlying

condition leading to depression, anxiety, and numerous other health problems there is an urgent need for prevention, early intervention, increased recognition, and treatment of stress and the related co-occurring psychiatric and medical conditions (Kalia, 2002).

## CHAPTER II

### Review of Literature

#### Physiological Effects of Stress

The autonomic nervous system is responsible for regulating our body's unconscious actions, often referred to as the involuntary nervous system (Marieb & Hoehn, 2010). It is made up of two parts, the sympathetic nervous system and the parasympathetic nervous system (Marieb & Hoehn, 2010). It is the sympathetic nervous system (SNS) which is responsible for triggering our body's fight or flight response when faced with a stressful situation (Marieb & Hoehn, 2010).

When a stressful situation occurs, the brain sends a signal to the autonomic nervous system and the pituitary gland to start producing epinephrine and cortisol, sometimes called the "stress hormones" (Tovian, 2016). As epinephrine begins to circulate throughout the body, it brings on a number of physiological changes. Heart rate and blood pressure increase, moving blood to the muscles, heart, and other vital organs, while shunting blood from non-vital organs such as those in the digestive tract (Tovian, 2016). Additionally, the bronchioles in the lungs dilate, respirations and metabolic levels increase (Marieb & Hoehn, 2010). The body then sends extra oxygen to the brain, which results in increased alertness and a sharpening of all the senses (Tovian, 2016). Meanwhile, epinephrine triggers the release of glucose and fats from temporary storage sites in the body (Tovian, 2016). These are the nutrients that supply the body with energy to either "fight" or "flee." As the initial surge of epinephrine begins to decrease, the second component of the stress response system is activated, known as the HPA axis

(Dusek, Hibberd, Buczynski, Chang, Dusek, Johnston, Wohlhueter, Benson & Zusman, 2008). This network consists of the hypothalamus, the pituitary gland, and the adrenal glands.

The HPA axis relies on a series of hormonal signals to keep the sympathetic nervous system activated (Dusek et al, 2008). If a threat is still being perceived, the hypothalamus releases corticotropin-releasing hormone (CRH), which travels to the pituitary gland, triggering the release of adrenocorticotropic hormone (ACTH) (Dusek et al, 2008). This hormone then prompts the adrenal glands to begin to release cortisol. This allows for the body to stay in its heightened state. When the threat passes, cortisol levels fall and the parasympathetic nervous system begins the process of stopping the stress response (Dusek et al, 2008).

The short term stress response to a perceived threat has been a useful adaptation, allowing humans to think quickly and stay alive and out of harm's way. However, when an individual repeatedly experiences the fight or flight response in daily life, it results in increased blood pressure, suppression of the immune system, increased risk of heart attack and stroke, speeds up the aging process and leaves one vulnerable to a host of mental and emotional problems (Marieb & Hoehn, 2010). Chronic stress, or a constant stress experienced over a prolonged period of time, can contribute to long-term problems for the heart and blood vessels (Dusek et al, 2008). The consistent and ongoing increase in heart rate, blood pressure and the elevated levels of stress hormones in the blood can take a considerable toll on the body.

## **Stress in Undergraduate Students**

According to the U.S. Department of Education, there were 18.2 million undergraduate students enrolled in the United States in 2015 (U.S. Department of Education, 2015). Over the years, there have been many studies researching the topic of stress in undergraduate students and the effects stress has on this population. Earlier studies have classified stressors into three main categories: academic pressures, social issues and financial problems (Shah, Hasan, Malik, Sreeramareddy, 2010). When stress is perceived negatively, students experience physical and psychological impairment (Misra & McKean, 2000).

Stress has often been associated with a variety of negative outcomes in this population including suicidal ideation, smoking, and drinking (Hudd, S. et al, 2000). There is a large portion of research that shows a connection between stress in college students and participation in smoking and substance abuse (e.g., illegal drugs and alcohol). National surveys indicate that 40-44% of college students engage in binge drinking (Butler et al., 2010). It is the use of alcohol that is linked to thousands of early deaths, accidental injuries, and health problems among college students every year (Butler et al., 2011). Results from a study conducted by Rice and Arsdale (2010) indicated that across all 522 participants, a significant indirect effect for drinking to cope supported its role as a mediator between stress and alcohol related problems.

A 2009 SAMHSA survey estimates that 27% of college students are current smokers (Brown et al., 2011). A study conducted by Nichter, Nichter, & Carkoglu (2007) attempted to address the social utility of smoking in contexts associated with stress among college students. Results from this study indicated that smoking served multiple



functions during times of stress for the students (Nichter, Nichter & Carkoglu, 2007). Smoking facilitated a brief social interaction during study times and served as a non-verbal signal to others that they were stressed (Nichter et al., 2007). As Nichter states, “Smoking is undertaken both as a means of taking one’s mind off a stressful subject/event as well as an aide in focusing one’s thoughts when under stress” (Nichter et al., 2007). Therefore, it is important for college students to find healthy ways to cope with stress.

### **Stress in the Nursing Major**

Over the years, there has been much interest in how stress effects students strictly in the nursing major. Research shows that sources of stress experienced by nursing students are experienced by most students in general (examinations, assignments and assessments). Nursing students, however, also experience longer hours of study, an associated lack of free time, and stress related to the clinical environment such as working with dying patients, conflicts with staff, insecurity about clinical competence, and work overload (Gibbons, Dempster & Moutray, 2010). Quantitative and qualitative studies have found that the clinical experience component of a nursing program is a major source of stress, with students citing feelings of inadequacy, insecurity, fear of making mistakes, and a perceived lack of skill and experience in caring for patients (Goff, 2011).

Research also suggests that nursing students perceive higher levels of stress than students in other health-related majors. Beck, Hackett, Srivastava, McKim and Rockwell (1997) compared the perception levels of stress in 552 full-time students in two baccalaureate nursing programs, and then compared these groups with the perception

levels of stress in students in medicine, pharmacy, and social work (Beck et al., 1997). Results showed that nursing students experienced higher levels of stress and more physical and psychological symptoms than students in the other health related disciplines (Beck et al., 1997). Although the sources of stress in all the groups are common, the level of stress management was significantly lower in the nursing group than in the medical, pharmacy, and social work groups (Beck et al., 1997). This study may also support that gender may play a role in perceived stress since there were significantly more females in the nursing program than in the other health related programs (Beck et al., 1997).

In a study conducted by Chernomas and Shapiro (2013), 437 nursing students between the ages of 21-25 were given an online survey to test for stress, depression, and anxiety. From this sample, 10% had scores in the severe and extremely severe categories in depression; 16% had scores in the severe and extremely severe categories in anxiety; and 10% had scores in the severe and extremely severe categories of stress (Chernomas & Shapiro, 2013). The multiple demands of students' personal lives and school related expectations combined to create stress for many of the participants. The researchers state, "These findings are consistent with other research that identifies multiple demands as a source of stress for nursing students" (Chernomas & Shapiro, 2013).

Nursing is a stressful occupation and the clinical placement exposes students early on to the realities of working in such a high stress job. The impact of stress on a student's experience as an undergraduate may impact their future career as a professional nurse. Extensive research has established that stress affects problem solving ability and coping, and leads to decreased learning and retention (Goff, 2011). Gibbons, Dempster and Moutray (2010) concluded that the well-being of nursing students "has a direct

bearing on their fitness to practice and on patient safety”. It is important for nursing students to learn how to handle stress while still in school so they are then able to successfully handle stress in the workplace.

### **Effects of Stress Management**

The use of positive coping strategies are key determinants of long-term psychological, emotional, and physiological success. The most widely used definition of coping comes from researchers Lazarus and Folkman. They define coping as, “Constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984). The ways in which adolescents and young adults cope with stress are potentially important predictors of the impact of stress on current and future situations (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Research has shown that the use of positive coping strategies can reduce stress and psychopathology (Compas et al., 2001).

There are multiple different coping strategies that may be used to help reduce stress levels in undergraduate students. A pilot study conducted in 2004 consisting of 16 nursing students examined the effects of mindfulness meditation. This involved the process of learning how to be self-reflective, self-aware, accepting of others, and better able to develop positive coping resources (Beddoe & Murphy, 2004). The participants reported a decrease in stress levels and experienced a greater well-being and improved coping skills (Beddoe & Murphy, 2004). In a 2003 study, college students were asked to write for four days about either stressful experiences (disclosure group) or time management (control group) (Lumley & Provenzano, 2003). The students were asked to

rate their mood before and after writing each day, and transcripts provided GPAs for the baseline (Lumley & Provenzano, 2003). The results demonstrated that the disclosure group received significantly better GPAs the next semester than the control group (Lumley & Provenzano, 2003). The disclosure group also reported an improvement in mood from the first to last writing days over the control group (Lumley & Provenzano, 2003). This particular study demonstrated writing about general life stress for four days was found to positively influence academic performance and somatic symptoms (Lumley & Provenzano, 2003). There are many different coping strategies that have been shown to be effective; however, further research on larger sample groups is needed to explore how specific types of stress management affect stress levels and the potential impact on academic performance.

### **Use of the Perceived Stress Scale-10**

The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress (Cohen, 1994). Prior to the development of the PSS, assessment of stress tended to focus on objective indicators (e.g., frequencies) of specific stressors (e.g., chronic illness, family loss, new family members) (Cohen, 1994). In 1983, Sheldon Cohen and his colleagues created the Perceived Stress Scale (PSS) (Cohen, Kamarck & Mermelstein, 1983). According to Cohen, "This measure was designed not to measure the frequency or presence of specific stressful events, but to measure the degree to which individuals appraise situations in their lives as stressful" (Cohen, 1994). PSS is not a diagnostic instrument, but it is proposed to make comparisons between individuals' perceived stress related to current, objective events (Kalaldehy & Shosha, 2012). A higher PSS score correlates with a higher

risk factor for some disorders, such as depression and anxiety (Kalaldeh & Shosha, 2012). Because this scale is general in nature and free of specific contents, it makes it easier to be used for any sub-population group (Kalaldeh & Shosha, 2012).

The PSS has several advantages over other tools designed for measuring stress. Firstly, it is a time efficient scale that can be administered in only a few minutes and it is easy to score (Kalaldeh & Shosha, 2012). Secondly, the PSS questions are easy to understand and the different response options are simple to grasp (Kalaldeh & Shosha, 2012). Thirdly, PSS is not limited for a particular situation; thus, it is applicable for occurred and ongoing life events (Kalaldeh & Shosha, 2012). Finally, the PSS can be used as an outcome variable, measuring people's experienced levels of stress, coping processes, and personality factors (Kalaldeh & Shosha, 2012). Limitations of the PSS are that the predictive validity of the PSS is expected to fall off rapidly after four to eight weeks as a result of the influence of stress appraisal by daily hassles, major events, and changes in coping resources (Kalaldeh & Shosha, 2012).

There are two versions of the PSS. There is the original 14-item scale and then the shortened 10-item scale (Lee, 2012). There is a large body of research that has shown the PSS-10 to be a reliable tool when measuring stress, especially to those in populations of college students (Lee, 2013; Nordin & Nordin 2013). A study conducted in 2012 by Eun-Hyun Lee compared the psychometric properties of the three versions. Lee concluded that the psychometric properties of the PSS-10 are superior to those of the PSS-14 and therefore recommended the use of the PSS-10 to measure perceived stress both in practice and research (Lee, 2012). Studies have also shown the PSS-10 provides approximately normally distributed data, has good internal reliability, and has good

construct validity with anxiety, depression, and mental/physical exhaustion (Nordin & Nordin, 2013)

## **CHAPTER III**

### **Methodology**

The purpose of this quantitative study was to compare the perceived stress levels in undergraduate students, particularly those students in the majors of nursing, engineering, and education. This current study used a non-randomized, non-experimental convenience sample to assess perceived stress levels of the undergraduate students. For the purpose of this research, the researcher administered the Perceived Stress Scale-10 (PSS-10) to three classes consisting of nursing, education, and engineering students enrolled in 300-level courses.

#### **Sample and Setting**

The study consisted of approximately 76 students between 18-39 years old enrolled in 300-level courses attending Carroll College. Carroll College is a four-year liberal arts undergraduate college with enrollment of approximately 1400 students. The study consisted of 16 male and 60 female participants of a variety of ethnicities. Inclusion criteria included all voluntary participants who provided informed consent and were enrolled in a 300-level course in the nursing, education, or engineering majors (39 nursing students, 21 education students, and 16 engineering students). Participants were required to be over the age of 18 and to be able to read and understand the English language. No students were excluded for any other reason.

#### **Questionnaire**

The questionnaire used was the Perceived Stress Scale-10 (see Appendix A) to compare and measure the perceived stress levels of students enrolled in nursing,

education, and engineering 300-level courses. The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress (Cohen, 1994). There is a large body of research that has shown the PSS-10 to be a reliable tool when measuring stress, especially in populations of college students (Lee, 2013; Nordin & Nordin 2013). Research studies have demonstrated the PSS-10 provides approximately normally distributed data, has good internal reliability, and has good construct validity with anxiety, depression, and mental/physical exhaustion (Nordin & Nordin, 2013).

The researcher utilized a Survey Monkey program to create an online version of the PSS-10. Additional questions were added to the survey to obtain information regarding the participants' major, age range, and gender. The PSS-10 Survey Monkey questionnaire was designed to obtain quantitative data for analysis. Prior to any data collection, participants read and completed an informed consent (see Appendix A).

### **Data Collection**

The Carroll College Institutional Review Board approved an IRB application, prior to the initiation of data collection. Prior to data collection occurring, the researcher met with the chairpersons of the nursing, engineering, and education departments to receive permission to conduct the research study. The professors of each of the chosen 300-level courses, within which the survey was to be administered, also granted permission prior to data collection.

The researcher conducted data collection by attending three 300-level courses. Data collection was conducted in one nursing 300-level course, one engineering 300-



level course, and one education 300-level course. The professor of each course was asked to leave the room while the research study was thoroughly explained by the researcher, informed consent was obtained and the data collection was completed. Data collection was completed electronically during class time through the use of a Survey Monkey questionnaire of the PSS-10 measurement tool (see Appendix A). Additional questions were added to the survey to obtain information regarding the participants' major, age range, and gender. Students primarily used their own personal electronic devices and iPads were provided to students who needed them.

After all data collection was completed, the researcher received the compiled results of the Survey Monkey PSS-10 questionnaire for review and analysis.

### **Confidentiality**

All data was collected strictly confidential. The informed consent was distributed to all potential participants prior to data collection (see Appendix B). All potential participants were asked to read and sign the consent form before completing the questionnaire. The consent form confirmed that all participation was voluntary and that participants could withdraw from the study any time. The consent form also declared that data collection would be confidential and that no participant identifiers would be utilized.

The survey with the PSS-10 questionnaire was provided to the participants utilizing a survey monkey tool. There were no participant personal identifiers required on the survey. Survey Monkey utilizes a secure network and is password protected to ensure all data collection was kept confidential. All consent forms were collected, placed in a sealed envelope, and placed in a locked file cabinet in the Nursing Department. All

surveys were kept separate from the signed participant consent forms to ensure participant anonymity.

### **Data Analysis**

The quantitative data was analyzed using a two-sample t-test and a single factor ANOVA. A two-sample t-test is used to compare whether the average difference between two groups is really significant or if it is due to random chance. A single factor ANOVA is used to determine whether there are any significant differences between the means of three or more independent groups. Demographic analysis and descriptive analysis were also used to appropriately analyze the data (see Appendix C). The researcher chose a p-value of .05 to demonstrate significance.

## CHAPTER IV

### Results

The purpose of this quantitative study was to compare the perceived stress levels in undergraduate students, particularly those students in the majors of nursing, engineering, and education. This current study used a non-randomized, non-experimental convenience sample to assess perceived stress levels of the undergraduate students. By administering the Perceived Stress Scale-10 (PSS-10) to three classes consisting of nursing, education, and engineering students enrolled in 300-level courses, quantitative data was collected and analyzed using an independent two-samples *t*-test and a single factor ANOVA.

This study consisted of 76 participants (39 nursing students, 16 engineering students, 21 education students) (See Figure 1). Of these 76 participants, 60 students were female and 16 students were male (See Figure 2). The age ranges of the participants consisted of thirty-two 18-20-year-old participants, forty 21-23-year-old participants, one 24-26-year-old participant, 2 27-30-year-old participants, and one 31-39-year-old participant (See Figure 3).

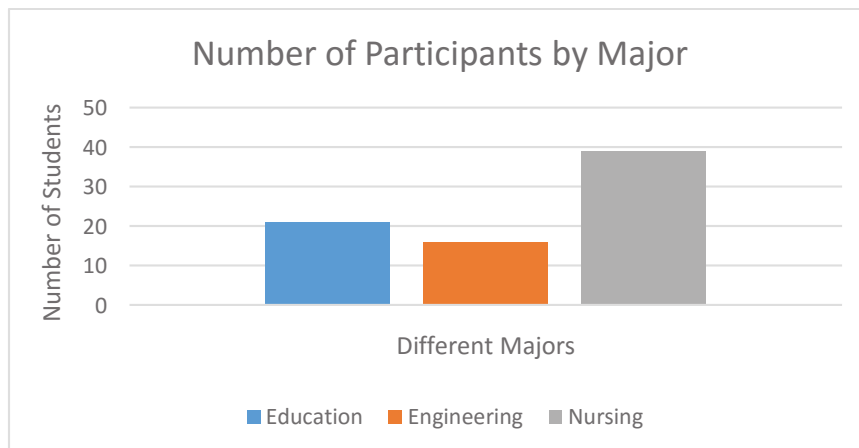


Figure 1. Number of participants by major

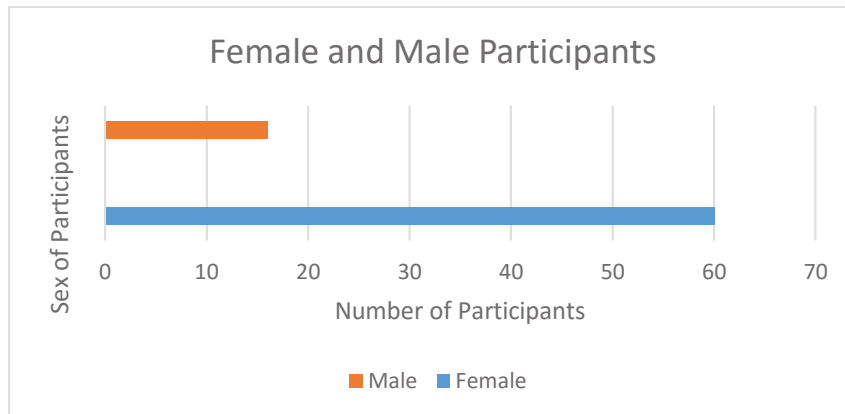


Figure 2. Number of female and male participants

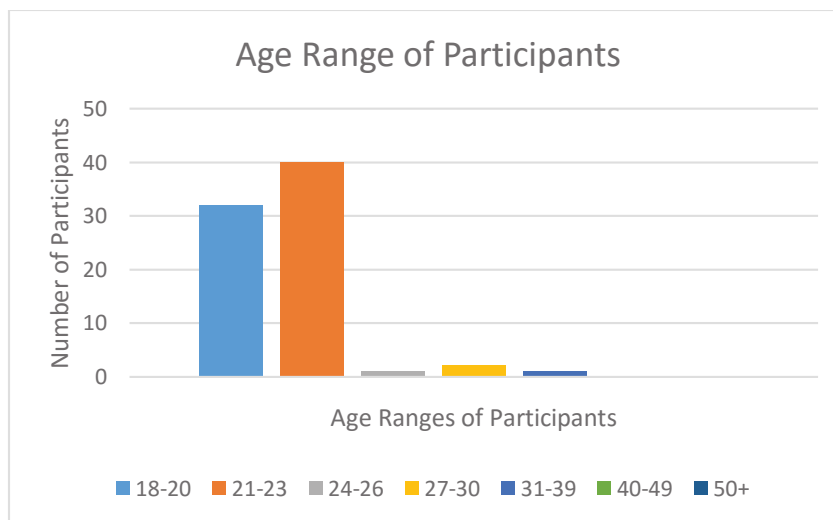


Figure 3. Age ranges of participants

The nursing group (N=39) was associated with a higher perceived stress level score  $M= 3.39$  ( $SD=0.96$ ). By comparison, the education (N=21) group was associated with a numerically smaller perceived stress level score  $M=3.21$  ( $SD=0.91$ ). To test the hypothesis that the nursing student group was associated with higher perceived stress levels, an independent samples t-test was performed. The independent samples t-test was

associated with a statistically significant effect,  $f(2, 838) = 4.99$ ,  $p = .006$ . The nursing group was associated with a statistically significant larger mean perceived stress level than those of the education group (see Table 1).

Table 1. *Nursing and education assuming equal variance*

	<i>Edu- Total</i>	<i>Nur- Total</i>
Mean	3.219512195	3.395833333
Variance	0.822275286	0.929068755
Observations	287	384
Pooled Variance	0.883414148	
Hypothesized Mean Difference	0	
df	669	
t Stat	-2.404182912	
P(T<=t) one-tail	0.008239768	
t Critical one-tail	1.647134485	
P(T<=t) two-tail	0.016479537	
t Critical two-tail	1.963516295	

The nursing group (N=39) was associated with a higher perceived stress level score  $M = 3.39$  ( $SD = 0.96$ ). By comparison, the engineering (N=16) group was associated with a numerically smaller perceived stress level score  $M = 3.14$  ( $SD = 1.02$ ). To test the hypothesis that the nursing student group was associated with higher perceived stress levels, an independent samples t-test was performed. The independent samples t-test was associated with a statistically significant effect,  $f(2, 838) = 4.99$ ,  $p = .006$ . The nursing group was associated with a statistically significant larger mean perceived stress level than those of the engineering group (see Table 2).

Table 2. *Nursing and engineering assuming equal variance*

	<i>Eng-Total</i>	<i>Nur-Total</i>
Mean	3.14375	3.395833333
Variance	1.042099057	0.929068755
Observations	160	384
Pooled Variance	0.962227091	
Hypothesized Mean Difference	0	
df	542	
t Stat	-2.731061604	
P(T<=t) one-tail	0.003259346	
t Critical one-tail	1.64766985	
P(T<=t) two-tail	0.006518692	
t Critical two-tail	1.964350493	

The nursing group (N=39) was associated with a higher perceived stress level score  $M= 3.39$  ( $SD=0.96$ ). By comparison, the engineering (N=16) and education (N=21) groups were associated with a numerically smaller perceived stress level score ( $M=3.14$  ( $SD=1.02$ );  $M=3.21$  ( $SD=0.91$ )). To test the hypothesis that the nursing student group was associated with higher perceived stress levels, an independent samples t-test was performed. The independent samples t-test was associated with a statistically significant effect,  $f(2, 838) = 4.99$ ,  $p = .006$ . The nursing group was associated with a statistically significant larger mean perceived stress level than those of the engineering and education groups (see Table 3).

Table 3. *Nursing and combined education and engineering assuming equal variances*

	<i>Nursing</i>	<i>Combined Education and Engineering</i>
Mean	3.395833333	3.192393736
Variance	0.929068755	0.900121387
Observations	384	447
Pooled Variance	0.913495141	
Hypothesized Mean Difference	0	
df	829	
t Stat	3.059153213	
P(T<=t) one-tail	0.001145529	
t Critical one-tail	1.646693776	
P(T<=t) two-tail	0.002291058	
t Critical two-tail	1.962829702	

A one-way ANOVA was conducted to compare the mean perceived stress level of to analyze the three groups: nursing, engineering and education (see Table 5). An analysis of variance demonstrated that there was a significant difference in the perceived stress between the groups ( $F(2,838) = 4.9998, p = 0.0069$ ). Therefore, the null hypothesis (*nursing students show no significant difference in perceived stress when compared with engineering and education students*) was rejected. The nursing students had a significantly higher perceived stress level than the engineering students and the education students.

Table 4. *ANOVA single factor summary*

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Edu	287	924	3.21951	0.822275
Nursing	384	1304	3.39583	0.929069
Engineering	160	503	3.14375	1.042099

Table 5. ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	9.138526716	2	4.569263	4.999816	0.006944	3.006597
Within Groups	756.697815	828	0.913886			
Total	765.8363418	830				

It was hypothesized that nursing students would have higher perceived levels of stress than those of the engineering and education students. Therefore, the null hypothesis (*nursing students show no significant difference in perceived stress when compared with engineering and education students*) was rejected. The results from this study have demonstrated that nursing students had statistically significant higher perceived stress levels than those of the education and engineering students using a p-value less than .05.



## CHAPTER V

### Discussion

The purpose of this study was to compare the perceived stress levels of undergraduate students in the nursing, education, and engineering majors. The researcher's hypothesis was that nursing students would have a higher perceived stress level than those students in the engineering and education programs. As expected, nursing students were found to have statistically significant higher levels of perceived stress compared to the students in the education and engineering majors. Reasons for nursing students demonstrating higher levels of perceived stress could be the result of multiple causes. However, the results from this study have shown to be similar to other studies of its kind.

As discussed earlier in the literature review, although nursing students face many similar sources of stress experienced by other students, their stress can be compounded by the time requirements of the nursing program that lead to decreased time for other academic work and other activities, such as a job or family/children. Nursing students also experience high levels of stress due to the rigorous academic and emotional demands placed on them when they begin to take care of patients in the clinical setting. Gibbons, Dempster and Moutray concluded that the well-being of nursing students "has a direct bearing on their fitness to practice and on patient safety" (Gibbons, Dempster, & Moutray, 2010).

As seen in previous research, results demonstrated that nursing students experienced higher levels of stress and more physical and psychological symptoms than

students in other health related disciplines (Beck, Hackett, Srivastava, McKim & Rockwell, 1997). High levels of stress have been connected to negative physical and psychological outcomes. Long-term exposure to stress can lead to serious health problems like depression, anxiety, fatigue, and obesity, and has also been found to be linked to some of the leading causes of death such as cancer, accidents, cirrhosis, and suicide (Sinha & Jastreboff, 2013). Stress has also been found to be linked to the development of most major mental health problems, such as depression, PTSD, and anxiety. Stress has been found to affect problem solving ability and coping, and leads to decreased learning and retention (Goff, 2011). These are all critical skills needed by every nurse in the workforce. Undergraduate nursing students with high levels of perceived stress have the potential for negative patient outcomes not only in the clinical setting, but also when they become new graduate nurses. It is important that undergraduate nursing students learn to cope with stress while still in school so that once they are in the field they are able to help patients to the best of their ability and keep them out of harm's way.

This study demonstrated that nursing students have increased levels of perceived stress and the implications of increased stress on nursing students can negatively affect their physical and psychological health. As stated earlier, high levels of stress have been connected to negative physical and psychological outcomes. Across the globe, research studies have demonstrated that nursing students have increased levels of stress. Perhaps, nursing schools need to evaluate the way that nursing education is being conducted. If this is a problem that is plaguing nursing programs around the globe it is important for educators to find a way to help alleviate this stress and implement some type of stress

reduction teaching. The introduction of stress reduction techniques and the teaching of positive coping mechanisms within the nursing program may help to decrease the perceived level of stress in the nursing students. The use of positive coping strategies are key determinants of long-term psychological, emotional, and physiological success. Research has shown that the use of positive coping strategies can reduce stress and psychopathology (Compas et al., 2001).

Another factor adding to the nursing students' high stress levels is having very little free time due to long hours and a heavy work load. Perhaps, it would be helpful to extend nursing programs another year to help alleviate some of the stress that this lack of free time causes. Adding an extra year would allow the students to have more time to get school work done, not have such a large workload and spend more time doing other activities.

After careful analysis, there were several limitations identified in the current study. One limitation is the relatively small sample size of 76 students. A larger sample size would be more representative of the population of college students and would limit the potential influence of outlier data. Additionally, participant information was gathered on gender and age; however, due to small sample size and low variability, this data was not significant enough for statistical analysis. A larger number of participants may provide the opportunity to assess the significance of age or gender in relation to perceived stress in the undergraduate student.

A second limitation to this study is the non-diverse group of participants. The majority of the participants were Caucasian, females between the ages of 18-21 years of age and of relatively good socioeconomic status. Additionally, all participants are

currently attending Carroll College, a small liberal arts undergraduate institution. The lack of diversity in the participant groups could limit the ability to generalize the findings of this research.

In the future, there are several directions in which to continue this research. Further inquiry is needed to discover the potential sources of stress to the undergraduate students to be better able to address the underlying cause or causes. Research can be conducted to see if the introduction of stress reduction techniques in nursing programs help decrease nursing students' levels of perceived stress. It would also be important to replicate this study at various other undergraduate nursing schools to increase the number of participants and help aide in diversifying the subjects. Another possible research study that would add to the current research is the replication of this study with non-pre-professional programs to see if there is any difference in the perceived level of stress compared to those in pre-professional programs.

In conclusion, although the exact cause/causes of nursing students' higher perceived levels of stress is unknown it is important that something be done to help reduce high stress levels among this population. High levels of stress have been found to be connected to many physical and psychological problems, which can have a large impact on an individual's life. It is important to find ways to reduce stress levels in nursing students and undergraduate students as a whole so they can go on to enjoy productive and fulfilling careers and live happy, healthy lives.

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APPENDIX A

PSS

**INSTRUCTIONS:**

The questions in this scale ask you about your feelings and thoughts during **THE LAST MONTH**. In each case, please indicate your response by placing an “X” over the circle representing **HOW OFTEN** you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
	0	1	2	3	4
1. In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. In the last month, how often have you felt nervous and “stressed”?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In the last month, how often have you been angered because of things that were outside your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**APPENDIX B**

**Carroll College**  
**Subject Consent Form**  
**For Participation in Human Research**

Title of Study: Perceived Stress in Undergraduate Students

You are being asked to participate in a research study about perceived stress undergraduate students in different programs. From this study, the investigator(s) hope to learn if there is different levels of perceived stress in different undergraduate programs.

You have been selected to participate in this study because you are in a 300 level course in either the nursing, education, or engineering programs. You also must be over the age of 18 to be eligible to participate. If you agree to participate, you will be asked to answer a questionnaire. The study is expected to involve 80 participants and will be conducted over 15 minutes.

Participation in this study may involve certain risks, including discovery of stress in your life. Benefits to you will be identification of stress and if you need to self-refer to the wellness center.

If you choose to participate, the cost to you will be 15 minutes of class time.

Your privacy is important to us. Confidentiality of records identifying you will be maintained by the use of no identifiable markers.

Further information about this research study may be obtained by emailing Taylor Rose at [trose@carroll.edu](mailto:trose@carroll.edu). Additional questions about the rights of human subjects can be answered by the Chair of the Institutional Review Board, Dr. Jamie Dolan (406) 447-4969 or [jdolan@carroll.edu](mailto:jdolan@carroll.edu).

I, \_\_\_\_\_ (*name of subject*), agree to participate in this research. The investigator has thoroughly explained the nature and process of this research to me. I have read the above and understand the discomforts, inconvenience and risk of this study. I understand that I have the right to refuse to participate in this study and that refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled. I also understand that I may withdraw from the study at any time without penalty or loss of benefits to which I am otherwise entitled. To the best of my knowledge I have no physical or mental condition that would be adversely affected by my participation. I have received a copy of this consent form for my own records.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Participant