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# An Analysis of Stress in Undergraduate Nursing Students at the University of Maine

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AN ANALYSIS OF STRESS IN UNDERGRADUATE NURSING STUDENTS AT

THE UNIVERSITY OF MAINE

by

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# ABSTRACT

Prolonged stress has shown a direct correlation to negative health outcomes. College students are amongst the population of individuals who experience chronic stress due to a variety of factors (e.g. heavy course load, pressures to succeed, and a new environment and social setting). Nursing students in particular are exposed to considerable stress as they face these same stress triggers as other college majors in addition to the strict pass/fail guidelines, clinical experience, and the pressures of life or death experiences when working in the health field. Knowing that stress has a profound impact on health and well-being, nursing students should be offered interventions, tools, and specific measures to relieve the stress they experience as undergraduate students working towards their degree. When comparing sophomore-level (predominantly second-year) and senior-level (predominantly fourth-year) undergraduate nursing students at the University of Maine, it was found that the sophomores had higher levels of perceived stress, emotional exhaustion, and cynicism in comparison to seniors. It is essential that nursing faculty target interventions to reduce stress at each level of the nursing program in order to combat the stressors that these students face and provide an environment that enhances learning and facilitates growth as the students continue with their education.

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TABLE OF CONTENTS

INTRODUCTION

Current and past literature has shown that prolonged stress contributes to negative health outcomes. Stress experienced for long periods of time can contribute to both physical and mental health issues such as symptoms that affect the overall well-being of the central nervous and endocrine system, the respiratory and cardiovascular system, and the immune system (American Institute of Stress (AIS), n.d.). In addition, chronic stress can have a detrimental psychological health impact causing anxiety, depression, headaches, insomnia, and memory/concentration issues (American Heart Association (AHA), 2017). Considering that stress has such a profound impact on the human body, it is necessary to focus on the populations that experience high amounts of stress so that these individuals can be targeted and interventions can be created to relieve the stress experienced by this population.

Undergraduate nursing students are prone to significant amounts of stress throughout their undergraduate education while obtaining their Bachelor of Science in nursing (BSN). Research has shown that undergraduate nursing students across a variety of disciplines have experienced high amounts of stress which has had the potential to impact both their academic and future career successes (Admi, Moshe-Eilon, Sharon, & Mann, 2018; Labrague et al., 2017; Magnavita & Chiorri, 2018; Rathnayake & Ekanayaka, 2016; Senturk & Dogan, 2018; Turner & McCarthy, 2017). The literature has shown that due to both academic and clinical pressures, undergraduate nursing students experience stress from heavy course load, difficulties finding time to study, juggling work and family time, difficulties maintaining social relationships, and the general

financial strains that college presents to all students (He, Turnbull, Kirshbaum, Phillips, & Klainin-Yobas, 2018; Labrague et al., 2017; Senturk & Dogan, 2018; Turner & McCarthy, 2017).

Although stress levels are found to be high amongst undergraduate nursing students, research has also shown that there is insufficient support to undergraduate nursing students, and little is being done to confront the issue of high stress in this population. For instance, interventions to relieve stress are not being supported by nursing faculty and clinical preceptors (Al, Alhosain, & Alsunaye, 2017; Delgado, Toukonen, & Wheeler, 2018; Patterson, 2016; Spadaro & Hunker, 2016; Turner & McCarthy, 2017). The purpose of this study was to identify the levels of stress and student burnout in sophomore-level and senior-level nursing students at the University of Maine to determine if stress increases, decreases, or remains the same throughout the curriculum. This study looked specifically at what the undergraduate nursing students find to be most stressful in their education, as well as what they do for interventions to relieve their stress and whether they feel their stress is well-managed and supported by nursing faculty and/or clinical preceptors. The students were also asked to share ideas of stress-relief interventions that could and should be implemented within the nursing program at the University of Maine to help students cope with their stressors.

The goal of this study was to gain insight on the stress experienced by the sophomore-level and senior-level nursing students so that trends in stress levels can be established and interventions can be set in place to relieve stress within the nursing program at the University of Maine. Nursing students overall are bright, young individuals who have much potential to make a difference in the nursing workforce.

However, if stress is not relieved at an early start, it may become too overwhelming for the students to continue, resulting in nursing student turnover. The findings of this study can be used by nursing faculty to encourage healthy outlets for stress-relief, thus, helping to avoid further turnover of nursing students. This will ultimately help students feel they can excel at their academics and clinical work, earn their diploma, and achieve great outcomes once they become registered nurses (RNs).

<div align="center">Review of the Literature</div>

Overview of Stress and Stress Response

According to current and past literature, stress has contributed to a variety of negative health outcomes in humans who are prone to high levels of stress for a prolonged period of time. The AHA (2017) stated that stress can have lasting health consequences, including both physical and mental impacts due to prolonged exposure to cortisol and other stress hormones in the body. Additionally, in 2017, the American Psychological Association completed a survey and found that 80% of respondents reported that at least one symptom of stress had been experienced over the past month (AHA, 2017). The physical and mental health issues that can arise in an individual exposed to lasting amounts of stress include but are not limited to anxiety, depression, headaches, insomnia, weight gain, memory and concentration issues, hypertension, heart disease, and stroke (AHA, 2017).

Stress is the body's natural response to pressures from outside sources or life events. When stress is encountered, the individual's body produces stress hormones to prepare the body to stay and fight or flee the scene. This phenomenon is known as the "Fight-or-Flight" response and is a physiological reaction that involves the body's

<div align="center">3</div>

sympathetic nervous system (SNS). Initially, when the individual encounters the stress, the individual's senses send information to the amygdala, the area of the brain that contributes to emotional processing. The amygdala interprets the information to determine if a distress signal should be sent to the hypothalamus. If the signal of stress is sent to the hypothalamus, the hypothalamus acts as the brain's command center and communicates with the rest of the body to initiate the "Fight-or-Flight" response (Harvard University, 2018).

The hypothalamus serves its role by communicating with the rest of the body through the autonomic nervous system (ANS). It activates the SNS by sending signals through the ANS to the adrenal glands. The adrenal glands distribute epinephrine, a hormone that produces an adrenaline response, throughout the body, which causes the body to react to the physiological stress. The individual's heart rate will increase to pump blood and oxygen to the muscles, heart, and vital organs, while the small airways in the lungs dilate to allow the lungs to take in extra oxygen. Alertness is heightened, along with the human senses of sight and hearing, while epinephrine also works to trigger the release of glucose and fat from storage within the body so that the body may use these nutrients as a source of energy (Harvard University, 2018).

As epinephrine works throughout the body to produce the changes necessary for survival in stressful situations, this hormone eventually wares off, which signals the hypothalamus to activate the second component of the stress response system. The second component of the stress response system is known as the HPA axis, a network involving the hypothalamus, the pituitary gland, and the adrenal glands. The HPA axis utilizes hormonal signals to keep the SNS activated, and as the individual continues to

perceive a threat, the hypothalamus releases corticotropin-releasing hormone (CRH).

CRH makes its way to the pituitary gland, triggering adrenocorticotropic hormone

(ACTH) to be released, and ACTH travels to the adrenal glands to release cortisol.

Cortisol circulates throughout the blood to keep the body on high alert during the

stressful situation until the stress subsides. Once the stress dissipates, the parasympathetic

nervous system (PSN), reacting opposite of the SNS, calms the body to decrease the

stress response system (Harvard University, 2018).

Stress is a natural physical and mental reaction to individual life experiences. It is

encountered by every human being and presents itself in varying circumstances

depending on the individual's social, economic, environmental, and genetic background.

Although stress is typically portrayed with a negative connotation, stress in short-term

situations can be beneficial to an individual's health and well-being. Short-term stress can

help individual coping and can give the individual motivation to complete certain tasks.

However, most often, stress is detrimental to the health of the individual, as chronic stress

can cause a variety of symptoms that affect overall well-being and impact the function of

body systems such as the central nervous and endocrine system, the respiratory and

cardiovascular system, the digestive system, the muscular system, the sexuality and

reproductive system, and the immune system (AIS, n.d.).

The various effects of long-term stress and its impact on the central nervous

system and endocrine system include: overeating or not consuming enough food, alcohol

or drug abuse, and social withdrawal. As stress continues, it impacts the respiratory

system by causing the individual to breathe faster in order to distribute oxygen quicker to

the vital organs. In addition, breathing faster exacerbates breathing issues such as asthma

and can make chronic respiratory diseases even worse. The cardiovascular system is under vasoconstriction as the stress hormones constrict the blood vessels to divert oxygen to the muscles, but the prolonged vasoconstriction causes hypertension, which can eventually lead to stroke and heart attack. The digestive system is impacted as the liver produces extra glucose to give a boost of energy when the body is under stress, and chronic stress can lead to overproduction of glucose and type 2 diabetes. Additionally, heartburn and acid reflux rates increase in those with chronic stress due to the increased hydrochloric acid production within the stomach. The impact of stress has also been shown to change peristalsis, causing the individual's gastrointestinal system to move food faster or slower through the body, resulting in diarrhea or constipation (AIS, n.d.).

In an individual with prolonged stress, the body continues to undergo negative health changes, as the muscular system is consistently under tension from the unyielding stress. When under stress, muscles tense up and do not relax until the body relaxes. Furthermore, tightening and stiffening of the muscles for long periods of time can result in headaches, back and shoulder pain, and body aches. These aches and pains can lead to lack of daily exercise and can cause the individual to resort to using medications instead of finding stress-relief. In males, testosterone levels have been shown to drop with prolonged stress, and this decline in testosterone can interfere with sperm production and can cause erectile dysfunction. In women, stress can impact the menstrual cycle, leading to heavier, more painful periods. Lastly, stress has a profound role in decreasing the immune system's response to foreign invaders. Those who are under chronic stress have an increased susceptibility to viral illnesses as well as bacterial infections with delayed recovery time (AIS, n.d.).

Stress in Undergraduate Nursing Students

Considering the evidence provided on stress and its adverse impact on health and well-being, it is essential that populations prone to stress find ways to manage and intervene to prevent chronic stress from occurring. College students, particularly nursing students, are individuals who are commonly consumed by stress due to various pressures presenting themselves in class and in the clinical setting. There is a variety of current and past literature that provides evidence of stress being a common finding in nursing students across the world. The significance of current and past research presents itself as evidence that there needs to be an enhanced system for stress-relief for college students, especially nursing students, who show evidence of chronic, high-amounts of stress. Additionally, the significance of the literature suggests that nursing students should find effective stress-relief tactics while they are still seeking their nursing degree so that they can effectively relieve their stress while earning their degree and while also working in the health care field after graduation. Stress continues after nursing students graduate, as working in a health care profession presents occupational stress. Furthermore, if nursing students can achieve a higher success rate at controlling stress levels and preventing chronic stress while they are in nursing school, nursing students will have the ability to more effectively control their stress once they enter the workforce.

A recent study conducted by Magmavita & Chiorri (2018) suggests that active learning creates improved feedback of learned behaviors and additional positive personality changes. For instance, the evidence gathered from the research explained that nursing students in conditions with high control (active) and low strain report lower levels of work impairment and stress than students who face low control (passive) and

high strain conditions. The researchers enrolled 633 students from a three-year undergraduate program for nurses from the Universita Cattolica del Sacro Cuore (Rome), and also decided to study 166 health care workers from the hospitals where the students were performing their training. Each of the participants were invited to complete the Nurses Work Functioning Questionnaire (NWFQ), a questionnaire that measures nurses' perceived clinical ability and individual experiences of their behavior. They were also asked to complete the Demand-control Support Questionnaire (DCS), a questionnaire that provides scores based on psychological demands, the ability to develop and use skills and autonomy with decision-making on the job, and the quality of relationships among co-workers and with supervisors (Magmavita & Chiorri, 2018).

A significant discovery of this study found that when comparing the scores of the nursing students and the health care worker groups on the NWFQ and DCS, the nursing students received significantly higher scores on the NWFQ and job strain than the health care workers. Additionally, the nursing student scores were significantly lower on all of the scales within the DCS questionnaire. Using Karasek's job demand-control model, an active learning hypothesis that assumes high job demands in combination with high job control increases learning and development on the job, the researchers concluded that nursing students have higher scores of work impairment and job strain (Magmavita & Chiorri, 2018). Magnavita & Chiorri (2018) stated that these results are consistent with other studies that identify academic stressors as an additional source of occupational stress for nursing students in regards to health care workers. Nursing students were found to have a higher chance of being classified as passive and high strain versus active and low strain, like the health care workers. The research also discussed that these findings

are consistent with other studies that show high stress levels in nursing students could potentially impact memory, concentration, and problem-solving abilities, which may compromise the learning, coping, and academic performance of these students. Limitations of the study included lack of control over personality of the individuals due to limited available assessment time and limitations with the instrument chosen to measure work impairment due to the NWFQ questionnaire being specific to the clinical work of nurses (Magmavita & Chiorri, 2018).

He et al. (2018) conducted a cross-sectional descriptive study with 538 participants to examine the predictors of psychological well-being (PWB) among undergraduate nursing students in Australia. The research included six validated scales: The Perceived Stress Scale; General Self-Efficacy Scale; Connor Davidson Resilience Scale; Multi-dimensional Scale of Perceived Social Support; the Psychological Wellbeing Scale, and the Mindfulness Awareness Scale. In addition, the researchers also collected data on resilience, social support, and mindfulness. Significant data obtained from the research demonstrated that undergraduate students who experienced levels of perceived stress expressed negative PWB, whereas those with greater resilience, mindfulness, and social support had lower negative PWB.

He et al. (2018) concluded that undergraduate nursing students in the study sample had a high level of perceived stress and low level of PWB. The high levels of stress were said to likely be caused by juggling life commitments (e.g. studying and work/family responsibilities). The research also suggested that online studies and classrooms, though beneficial when allowing the individual to work at their own pace, are a cause for stress, as they create difficulties in teaching oneself new information,

finding time to complete the work, and creating isolation from the professor and classmates. Financial difficulties also influenced stress, as the research suggested that financial strains create another factor that the individual needs to juggle, such as finding work to afford the finances of college (He et al., 2018). Along with the recognition of undergraduate nursing students experiencing high amounts of stress and decreased PWB, the researchers also found that resilience and mindfulness are strong predictors of positive PWB. Both resilience and mindfulness are skills that the research suggests support nursing students' ability to adapt in the work field, control emotions and behaviors, and have a greater PWB (He et al., 2018).

Though resilience and mindfulness are skills that help nursing students cope with stress, He et al. (2018) found that social support is also a factor that lowers negative PWB. Social support is said to aid in resiliency, buffer stress, and enhance positive mental health. The limitations within the study included lower than expected response rate, reliance on self-reported assessments of psychological well-being and other scales, and the use of a cross-sectional approach to perform the research. Furthermore, the researchers recommend that nursing students academic support should be continually examined due to the dynamic nature of the education and future career in the health care field. It is suggested that resources to manage PWB and stress need to be brought to students' attention earlier rather than later in the curriculum so that nursing students can build on these habits and utilize them throughout their entire academic experience (He et al., 2018).

Senturk & Dogan (2018) took previous knowledge from literature regarding stress in nursing students and conducted a study to determine the amount of stress experienced

by nursing students residing in the Southeastern Anatolia Region during their spring semester of the 2014-2015 academic year. Three hundred and eighteen participants in the study answered all questions within a Stress in Nurse Education Questionnaire (SINE) and Student Information Form (SIF) that had been developed by the researchers following a comprehensive review of the literature. The researchers focused on gathering specific data about socio-demographic characteristics of the nursing students who participated in the study, while also focusing on the stresses experienced by these students using the SINE Questionnaire with a 4-point Likert-type scale. Significant data was gathered by the researchers, as it was determined that there is a positive correlation between mean scores obtained by the students using the SINE subscale. Additionally, Senturk & Dogan (2018) found that variables such as gender, mother's educational background, father's educational background, father's working condition, and smoking are significant factors that impact the stress of the nursing students. The researchers discussed that some studies within the literature show that parents' high levels of education can impact behavioral, social, and emotional characteristics and academic conditions of adolescents. A parents' educational level can cause the adolescent to have an expectation about educational success, if the parents have an increased education, which places more stress on the students. Income, social circle, and social status can also impact school success and coping with stress, as found by the study (Senturk & Dogan, 2018).

Senturk & Dogan (2018) found that nursing students experience conditions such as different systems of education, taking exams, preparing for exams, homework, thoughts about future plans after graduation as academic stressors. Also, in addition to

academic stressors, nursing students experience conditions such as difficulty developing a relationship with health care professionals, decreased ability to cope with stressful conditions, slow response and weak social relations, occupational illiteracy, deficiencies in meeting patient expectations, difficulties adapting to hospital proceedings, anxiety about harming the patients, fear of giving misinformation, and anxiety about making a mistake in hospital procedures as clinical practice stressors. It was found that the nursing students within the study experience stress slightly above moderate level during their education, which involves the academic and clinical practice stressors equally (Senturk & Dogan, 2018). The limitations within the study were not reported. However, due to a response rate of 66.94% and the study's data gathered, the researchers were successful with their study due to the discovery of socio-demographic characteristics that impact nursing student stresses and what stressors nursing students are predisposed to both academically and clinically (Senturk & Dogan, 2018).

Admi et al. (2018) conducted a study to research the understanding of why nursing students were found to experience significantly more stress and stress-related health outcomes compared to non-nursing students. It was found that a major source of stress in nursing students, in addition to their academic requirements, is the clinical practice in different health care organizations. Admi et al. (2018) investigated the perceptions of stress and satisfaction of undergraduate nursing students during different stages of clinical learning experiences in three higher education institutions in Israel. Using a cross-sectional study Admi et al. (2018) sought to examine the type, level, and ranking of stress in different stages of the nursing curriculum, the association between

nursing students' demographic and professional characteristics and stress levels, and the relationship between nursing students' stress in the clinical practice and their satisfaction.

Before conducting their research, the researchers decided to perform a literature review on each of these categories that they sought to examine to gather some evidence. Their literature analysis revealed that undergraduate nursing students reported significantly higher stress levels compared to undergraduate students from the general student population. Qualitative studies that were examined showed that sense of inadequacy, being ignored, ineffective communication, ambivalence, disgust, frustration and conflict were major themes that emerged in regards to the nursing students' stress. Upon review of 23 quantitative articles, the main clinical sources of stress in nursing students included fear of unknown situations, mistakes with patients, and handling of technical equipment.

After evaluating current and past literature, Admi et al. (2018) obtained significant data through a cross-sectional study that included 339 nursing students. The study was designed using three parts: Nursing Students Stress Scale (NSSS); Nursing Students Professional Satisfaction (NSPS); and demographic characteristics. The NSSS sought to measure the degree of stress perceived by nursing students in specific encounters during their clinical experience. The NSPS was divided into 3 sections to determine satisfaction with nursing studies, clinical experience, and the choice of nursing as a profession. The last part of the questionnaires included the demographic and personal characteristics such as age, gender, family status, native language, year of study, previous nursing experience, and working as a nurse aid during studies. The results gathered included a mild-moderate stress level experienced by the nursing students relating to

stressful factors such as education-reality conflict, patient's pain and suffering, inadequate knowledge and training, insufficient hospital resources, and close supervision (Admi et al., 2018).

Second-year preclinical students recorded significantly higher, compared to third and fourth-year students when determining stress factors. Women in the study typically showed higher levels of stress compared to male students, while older students, aged 31 and more, reported significantly higher stress in two factors within the NSSS questionnaire. Many nursing students found three out of five most stressful situations to be related to inadequate knowledge and training. Additionally, when looking at nursing students' satisfaction, the research results showed that nursing students were typically very satisfied with nursing as a major, while having low satisfaction with the nursing studies experienced. Apparently, nursing students claimed that inadequate knowledge and training, insufficient resources, and close supervision correlated to negative reports of more stress in clinical practice and less satisfaction (Admi et al., 2018). Many nursing students mentioned that dissatisfaction with clinical practice related to several factors such as: too short periods of practice, inadequate supervision from clinical preceptors, nurse teachers, ward managers and staff nurses, lack of individualized supervision, problematic evaluation processes, the quality of patient care on the ward, not being prepared for clinical practice, and the role of the nurse (Admi et al., 2018). Limitations of the research provided by Admi et al. (2018) included the research being done by cross-sectional study and potential lack of social desirability answers. Nonetheless, the research shows that nursing students need to experience higher quality stress-reduction interventions that tailor the individual needs of nursing students and target the specific

stress factors being experienced in the clinical settings to enhance satisfaction and eliminate stress.

Simulation use is increasing in schools of nursing and research has shown that this may be an additional source of stress for nursing students. Allen (2018) found that although literature provides evidence of stress in simulation, there is a gap in the literature examining the psychological and physiological stress experienced by nursing students when using a simulated high-fidelity manikin versus a standardized patient. Furthermore, Allen (2018) decided to conduct a study to determine how this particular change influences the stress experienced by nursing students. Using the anchored instruction theory, a constructivist learning theory that incorporates technology when creating a real-life case-based problem for students to solve, Allen (2018) gathered a sample size of 159 undergraduate students from one university in suburban Chicago.

The participants in the sample were separated into high fidelity or standardized patient and learner type (depending on whether they are an active or observational learner) using a randomized software program. The randomized software program incorporated a coin flip to determine assignment of manikin or standardized patient, while learner type was determined by assigning a number and then entering this number into the software to have a new number issued to the participants. Using Spielberger's State and Trait Anxiety Inventory (STAI) Scale and measuring the percentage of change in physiological stress experienced pre-simulation and post-simulation through systolic and diastolic blood pressure and pulse, Allen (2018) received significant findings from the research. Statistical analysis was conducted through assessing for assumptions for two-way analysis of variance and independent $t$ tests were assumed. Allen (2018) found

that participants were equally as likely to experience physiological stress as measured by percentage of change in heart rate, regardless of the type of simulated patient (manikin or standardized patient). Systolic and diastolic blood pressure was shown to be equal between both groups of participants, despite care being tended to the high-fidelity manikin or standardized patient (Allen, 2018).

However, Allen (2018) did find that there was a statistically significant difference between each group in regards to psychological stress experienced by simulated patient type (high fidelity manikin or standardized patient). The high-fidelity manikin type led to more psychological stress than the standardized patient did (Allen, 2018). When examining how active learners versus observational learners related in comparison to heart rate, it was found that active learners experienced a greater change in heart rate, with the least amount of change occurring in the observing learners involving the standardized patient. When recording systolic blood pressure, the active learners experienced greater physiological stress when the high-fidelity manikin was cared for, in comparison to the standardized patient. Alternatively, the observational learners appeared to experience greater physiological stress when caring for the standardized patient. Additionally, all participants, regardless of learning type experienced equal physiological stress when recording diastolic blood pressure.

Lastly, when determining the relationship between simulated patient type, learning type, and psychological stress, measuring a change in scores from pre-simulation to post-simulation revealed that the high-fidelity manikin led to greater psychological stress than the standardized patient. Active learners also experienced more than two times overall psychological stress than observing learners (Allen, 2018). There were limitations

in the study such as the research being conducted at one school of nursing in suburban Chicago, the inability to place the live actresses posing as the standardized patient in a body bag, and limits involving gender and age bracket of the female standardized patient models. Nonetheless, the research provided by Allen (2018) emphasizes the importance for nursing educators to offer simulation opportunities that involve the least amount of stress as possible and improve the psychosocial needs of the nursing students through debriefing conferences afterwards.

Rathnayake & Ekanayaka (2016) performed a research study on undergraduate nursing students in Sri Lanka. These researchers found from prior literature review that stress can be a barrier for concentration, problem solving, decision making, and other necessary abilities for students' learning, and were concerned that stress in undergraduate nursing students in Sri Lanka had not yet been analyzed. A cross-sectional study was conducted with 95 undergraduate nursing students in Sri Lanka, and of the 95 participants, 3 were excluded due to report of missing values or previous psychiatric problems. Data was collected using a self-administered questionnaire with 6 sections including: sociodemographic data and past psychiatric illness, overall satisfaction with nursing program, factors of physical well-being, possible stressors that students may face, overall health status among nursing students, and depression, anxiety, and stress among nursing students using the Depression and Anxiety Stress Scale (DASS). Data was then recorded and analyzed using the Statistical Package for Social Sciences (SPSS), while descriptive statistics were used to describe the socio-demographic data and characteristics.

Demographic results showed that the majority of respondents were from the fourth-year class, lived in university accommodation, and ranged in age from 21-27-years-old. The majority of the participants were not satisfied with the nursing program, with only 2.2% of respondents fully satisfied. 26.1% of the participants reported that the main response for selecting a nursing program as a choice for career was 'aptitude' followed by being unsuccessful entering another university program. A majority of respondents reported that there were 9-12 stressors experienced in their lives, with low physical well-being factors. The perceived health status of nearly half of the participants (52.5%) showed that they felt their physical health was good, while 44.6% felt their mental health was good. However, half of the respondents had a normal level of depressive symptoms while 16.3% and 15.2% of respondents presented with severe and extremely severe depressive symptoms. Although the majority of participants presented with normal level of anxiety (40.2%), 21.7% of the respondents reported extremely severe symptoms of stress, and only 17.4% of the respondents reported a normal level of stress. Furthermore, it was found that age, academic year of the students, satisfaction with the nursing program, physical well-being factors, possible stressors, and physical and mental health all were associated with these findings (Rathnayake & Ekanayaka, 2016).

The research conducted by Rathnayake & Ekanayaka (2016) highlights the prevalence of anxiety, depression, and stress in nursing students, showing that the majority of nursing students experience mild to extremely severe symptoms of depression (51.1%), anxiety (59.8%), and stress (82.6%). With the finding that strong significant positive association exists between depression, anxiety, and stress, Rathnayake & Ekanayaka's (2016) research serves as an indicator for risk of poor psychological well-

being in nursing students and need for intervention. Additionally, it can also be argued that lack of professional knowledge, skills, patient care, and clinical performance can occur since poor psychological well-being has been shown to interfere with the learning and limit the academic performance and success of students. This study had limitations of a cross-sectional design, data being collected only from one undergraduate nursing program in Sri Lanka, and a small sample size. Nonetheless, the data shows that physical health, mental health, possible stressors, demographics such as age and academic year, and satisfaction with the nursing program need to be considered so that appropriate interventions can be established to prevent depression, anxiety, and stress in undergraduate nursing students.

Labrague et al. (2017) conducted a study to compare perceptions of stress and quality of life (QOL) among nursing students from three varying countries (the Philippines, Greece, and Nigeria). It was found from previous literature reviews that mounting evidence has suggested that nursing students are frequently exposed to significantly high levels of stress that ranges from moderate to severe throughout the nursing clinical practice. Additionally, Labrague et al. (2017) also discussed that prior literature shows age, monthly family income, weak coping abilities, history of depression, level of education, emotional support, and self-esteem were identified as important predictors of stress. Due to this knowledge, Labrague et al. (2017) conducted a cross-sectional research design using two standardized questionnaires: The Quality of Life Evaluation Scale (QOLES) and the Perceived Stress Scale (PSS).

A convenience sample of 547 nursing students from three countries, Philippines, Greece, and Nigeria, participated in a study lasting 4 months. Each participant was

currently enrolled as second through fourth-level nursing student, and first-year students were excluded due to limited clinical experience. Data was collected using the self-reporting scales, PSS and QOLES from the questionnaires, where the PSS was developed to identify stress levels and stressors in nursing students during clinical training, while the QOLES was designed to access QOL in nursing students. Descriptive statistics such as means, frequencies, standard deviations, and percentages were gathered using the data obtained. The overall PSS mean score for the three countries was 2.06 of a possible mean score of 5. This data indicates that the nursing students experienced stress from assignments and workloads, stress from taking care of patients, stress from the clinical environment, and stress from faculty. The stress from assignments and workloads was recorded the highest with a mean score of 2.46 and a standard deviation of 0.78, while the lowest rated subscale was stress from taking care of patients with a mean score of 1.74 and a standard deviation of 0.88. This means that responders on average consider stress from assignments and workloads as a more significant stressor than taking care of patients. Quality of life dimensions according to country of origin were determined, and it was found that the mean score for each dimension revealed the social dimension scoring the highest, while the physical dimension scored the lowest.

The overall mean value of the PSS within the study was recorded below its midpoint with moderate variability (mean value being 2.06 and standard deviation being 0.62). This suggests that moderate levels of stress are occurring within the undergraduate nursing students. Another result that has been found consistently in other research studies that was also found in the Labrague et al. (2017) study was nursing students within this study reported higher levels of stress from assignments and workloads. The stress from

assignments and workloads is expected, as nursing students experience heavy nursing curriculum content with long clinical hours. This study also suggested other stressors such as fear of making a mistake with nursing procedures, the perceptions from the nursing and hospital staff, the evaluation from the clinical instructor, contact with patients who are suffering severe illnesses, and caring for terminally ill patients, which are said to contribute to the stress in the clinical environment (Labrague et al., 2017).

Other significant data obtained from Labrague et al. (2017) included the finding that Filipino nursing students experienced higher levels of stress as compared to nursing students from Nigeria and Greece. It is thought that the differences in the country's nursing curriculum or varying social or economic differences could be contributing to this result, as Filipino nursing students are required to complete 2,346 clinical hours, which is higher than the clinical hour requirements in Greece and Nigeria. The researchers in this study found that QOL was rated high, specifically with social dimensions, suggesting that nursing students perceived better social health. However, physical dimensions of QOL were reported as poor, emphasizing that nursing students experience pain, discomfort, fatigue, and decreased quality of sleep and rest. Labrague et al. (2017) found that QOL differed according to the country of origin, as Greek nursing students had higher levels of QOL than Nigerian nursing students, but this finding can also be explained by socioeconomic status and cultural differences. The negative QOL perceptions experienced by all undergraduate nursing students were mainly a result of lack of professional knowledge and skills, taking care of patients, clinical environment, faculty and staff, peers, and daily life.

Although this study demonstrates several significant findings, especially being one of few research studies that provides results indicating the impacts on nursing students QOL, there were limitations such as the research design not being a longitudinal study to determine nursing students' stress over a prolonged period of time, due to the dynamic nature of stress. Additionally, there was a qualitative interview process that could have allowed participants to share other concerns about stress, stressors, and methods of handling the situations. Despite these limitations, Labrague et al. (2017) provides data that emphasizes the significance of handling the stress in nursing students and promoting stress-relief as well as implications for future studies and how nursing educators can play important roles in advocating for and managing student stress.

Due to the nature of stress being a prevalent finding in undergraduate nursing students, it is not surprising that stress continues after graduation when the undergraduate nursing student enters the workforce. It is necessary to review stress in both undergraduate nursing students and nurses in the occupational setting to evaluate the trends in levels of stress as the student moves from education to a full-time job as a nurse. Sarafis, Rousaki, Tsounis, Malliarou, Lahana, Bamidis, Niakas, & Papastavrou (2016) conducted research to determine occupational stress in nurses, knowing that work-related stress can be damaging to the individual's physical and mental health and has a direct connection to high staff truancy and low levels of productivity. Past literature has shown that nurses experience high job demands and a combination of too much responsibility and too little authority, which has contributed to high amounts of stress.

Occupational stress is high in nurses, and high stress is found to be correlated with negative physical health problems such as migraines, back and joint pain, muscle

pain, long-term physical illnesses, hypertension, irritable bowel syndrome, duodenal ulcers, and immune and endocrine system illnesses. Many studies have also shown that occupational stress contributes to mental health issues such as anxiety, dysthymia, low self-esteem, depression, and feelings of inadequacy, which can eventually lead to mild psychiatric morbidity. The significance of the research conducted by Sarafis et al. (2016) is that a major consequence of excessive occupational stress is reduction in work efficiency, job satisfaction, and work attitudes, which may eventually lead to nurses considering resignation or job retirement. Limitations within the study conducted by Sarafis et al. (2016) include variability of nurses' educational and professional levels as well as a small sample size.

It is clear that stress continues to be an issue in both undergraduate nursing students due to academics and clinical pressures, as well as in nurses due to intense occupational demands. Furthermore, the research provided by Sarafis et al. (2016) supports the notion that interventions such as occupational health education and training programs, workshops and conferences to target facilitation and verbalization of feelings need to be created to lessen job stress experienced by nurses. Additionally, stress can be targeted on a primary level by adding interventions that promote stress-relief in undergraduate nursing students so that they have the skills and interventions to handle stress in school before they graduate and enter the workforce. Due to the fact that stress will continue to be an issue for nursing students as they move through the program, graduate, and enter the workforce, nursing students need to be taught how to handle and manage their stressors at an early stage so that they can be equipped to effectively handle and manage difficult situations in their future careers.

As the literature shows, nursing students across various settings are prone to stressors that can ultimately impact both their academic success and future career. Current and past literature has shown that a common theme exists in regard to the specific causes of stress in nursing students. For instance, of the literature reviewed above, nursing students are found to experience the most stress due to academic and clinical pressures (Admi et al., 2018; Labrague et al., 2017; Magmavita & Chiorri, 2018; Rathnayake & Ekanayaka, 2016; Senturk & Dogan, 2018). Specifically, the literature also mentioned that common sources of stress within the academic setting include: heavy course load, finding time to study, juggling work and family time, difficulties maintaining social relationships, and financial strains (He et al. 2018; Labrague et al., 2017; Senturk & Dogan, 2018). Additionally, nursing students face added pressures in the clinical setting, increasing nursing student stress. Common stressors in the clinical setting include: meeting new expectations in the setting, and fear of harming the patients or making a mistake (Admi et al., 2018; Labrague et al., 2017; Senturk & Dogan, 2018). It is important to note that though there are several studies reviewed that reported the exact same findings of stressors in nursing students, other articles reviewed had very similar findings that varied slightly. Furthermore, there are a variety of studies that support the conclusion that nursing students experience high amounts of stress during their undergraduate experience. Considering that undergraduate nursing students and experienced nurses in field are prone to high amounts of stress, it is essential that interventions are put in place to enhance coping ability, specifically for undergraduate nursing students, so that they are prepared to handle occupational stress in the future.

Interventions for Stress-Relief in Undergraduate Nursing Students

Turner & McCarthy (2017) conducted a systematic review of the literature to identify interventions aimed to support non-pharmacological stress management in nursing students. Of the 26 articles, a significant amount of data revealed that coping involves cognitive and behavioral efforts to manage a stressful environment. One literature review revealed that a mentoring program using registered nurse graduate student nurses as mentors resulted in a significant decrease in trait anxiety and improvements in academic performance and career choice satisfaction (Kim, Oliveri, Riingen, Taylor, & Rankin, 2013, as cited in Turner & McCarthy, 2017).

Art therapy was another intervention to relieve stress in nursing students, and this study revealed that art therapy supported relaxation, self-awareness, and empowerment, while promoting self-care and stress management (Hensel et al., 2012, as cited in Turner & McCarthy, 2017). Pet therapy was also shown to decrease anxiety scores as an intervention, but these values were non-significant (Young, 2012, as cited in Turner & McCarthy, 2017). Other studies included co-meditation classes and biofeedback-assisted relaxation training, which were found to effectively decrease stress levels in nursing students (Prato & Yucha, 2013, as cited in Turner & McCarthy, 2017), whereas guided imagery showed no significant change in stress levels or anxiety over time (Pare, 2014, as cited in Turner & McCarthy, 2017). Aromatherapy, in another research article reviewed by Turner & McCarthy (2017), was shown to result in lower stress levels post-exam versus pre-exam when used by nursing students during exams (Johnson, 2013, as cited in Turner & McCarthy, 2017). Research on reappraisal of stressors provided significant findings that self-reflection may decrease stress and anxiety. This decrease is due to

students being prompted to reappraise the meaning of stressors which allows them the ability to cope with stressors (Manning, Cronin, & Monaghan, 2009, as cited in Turner & McCarthy, 2017). Lastly, mindfulness-based cognitive therapy (MBCT) was shown to decrease perceived stress in 4 out of 5 participants, resulting in increased mindfulness (Schwarze, 2012, as cited in Turner & McCarthy, 2017).

Though several studies were examined in a literature review conducted by Turner & McCarthy (2017), the most significant findings revealed that studies which only focused on reducing the stressors or increasing coping were least effective. Optimal effectiveness of the intervention relies on a mixture of reduction of stressors, increased coping, and strategies involving reappraisal. After thoroughly reviewing three approaches to stress reduction (stressors, coping, and reappraisal) significant results were obtained. For instance, the results of studies aimed to reduce stressors were inconsistent with mixed results. The studies focused on strategies to relieve the consequences of stress by improving coping and management demonstrated conflicting results, and lastly, the studies combining decrease of stressors and increasing coping demonstrated significant results. The results of studies using reappraisal alone or in combination with another method were found to be consistently positive. Of the 26 articles that Turner & McCarthy (2017) used in their literature review, only 10 reported significant findings involving reduced stress or anxiety.

Limitations within the research conducted by Turner & McCarthy (2017) were small sample sizes, lack of diversity, lack of longitudinal studies, and wide variation in study designs. There was use of convenience sampling, attrition, and self-reported data. Additionally, there was low methodological rigor of the collective group of studies with

only three randomized control trials being identified. The lack of randomized control trials is unhelpful, as randomized control trials can provide definitive evidence of the effectiveness of the interventions. Furthermore, research on interventions that support nursing students stress-relief in the future should consist of randomized control trials that have larger sample sizes along with longitudinal studies that can examine the long-term effectiveness of the interventions. The benefits of these interventions in nursing students will not just support nursing students and faculty, but will also support healthcare employers and patients in the future.

Delgado et al. (2018) conducted a research study on the effects of canine play as a stress-relief intervention to be used for college students during finals week. These researchers wanted to observe the psychological and physiological measures of stress pre and post canine play intervention to determine if canine play offers benefits to university students. Past literature has shown that dogs and other animals have been used therapeutically to reduce non-psychiatric adult illnesses such as heart failure, cancer, stroke, chronic pain, and palliative care. The responses to these studies have been positive in the past, indicating that animal-assisted therapies are beneficial (Delgado et al., 2018). Delgado et al. (2018) used five dogs in the study: a Newfoundland, Labrador Retriever mix, Standard Poodle, Yorkshire Terrier, and 10-month old Pomeranian puppy. All animals were supervised by their handler owners and had scheduled appointments with students not exceeding 4 students in a 1-hour period. The students were coached as to what interactions are acceptable with the dogs, such as petting, sitting or talking, and specific playing.

A total of 48 students were recruited by posters throughout campus and classroom visits in the school of nursing. Each participant in the study had a 30-minute appointment, where they could choose the breed preference and were allowed to visit with the animal for a total of 15 minutes. A pre-test was recorded by taking demographic data, physiological tests, blood pressure, pulse, and salivary cortisol samples. Additionally, the psychological measures, such as the Perceived Stress Scale (PSS) and visual analog scale (VAS) were recorded to determine perception of stress and mood. Following the session, psychological measures were repeated, and a secondary salivary specimen was collected along with physiological tests (blood pressure and pulse). Delgado et al. (2018) found significant findings within this study, as all psychological measures documented significant reductions from pre-intervention levels using paired $t$ tests. The mean PSS score was reduced from 34.75 to 31.47, showing that stressors had declined from pre-test versus post-test. The visual analog scales revealed a decreased mean score from pre-test to post-test stress levels. In addition, Delgado et al. (2018) found that physiological data showed significant reductions in mean values of pulse and blood pressure, meaning that the interaction between the students and canines produced positive effects for heart and blood pressure health by lowering pulse rate and systolic blood pressure.

Mean pulse rate was recorded at 80.68 beats/min pre-test and was reduced to 76.83 beats/min post-test, while the average systolic blood pressure was 131.09 pre-test and 122.79 post-test. In regards to pre and post-test cortisol levels, Delgado et al. (2018) found that salivary cortisol levels showed a significant decrease from 0.26 pre-test to 0.21 post-test. This research study had limitations of a small, homogenous convenience sample, self-selection by those with a bias for positive animal interactions, PSS

alterations, using cortisol as the only chemical biomarker measurement, and having a period of 20-30 minutes between comparing cortisol specimens. However, despite these limitations, Delgado et al. (2018) had significant research findings. The results of this study support that interactions with dogs can alleviate the effects of stress in college students during stressful times. Using animals as an intervention to relieve stress in college students has been found to provide comfort and social support, in addition to physical tactile stimulation, which may generate positive feelings in the students. Knowing that animals are successful at reducing stress in college students, not just nursing students, this specific intervention could easily be accomplished on campus in a highly-populated student area, such as the library or union.

Spadaro & Hunker (2016) found through prior research that mindfulness was a strategy that had shown to be effective with mood, stress, and cognition in various populations. Spadaro & Hunker (2016) investigated the effect of an online modified mindfulness-based stress reduction intervention on stress, mood, and cognition. The researchers used a conceptual framework to guide their study that came from the Intentional Attention & Attitude model, a theory that supports the numerous internal human systems through regulation and feedback loops to achieve goals while functioning under stressful situations. The study design consisted of an eight-week online, asynchronous, mindfulness intervention that was based on the mindfulness-based stress reduction program. The goal was to research the stress in nursing students at baseline, eight weeks, and twenty-four weeks and measure cognition at both baseline and eight weeks. The study consisted of 26 students who were enrolled at the mid-Atlantic U.S. university either in the Doctor of Nursing Practice (DNP) program (88%), in healthcare

and at varying stages of nursing program completion (73%), or starting out or just completing the first semester of their program (54%).

Prior to initiating the intervention, the researchers planned to gather the research data using the PSS to measure subjective stress, the Hospital Anxiety and Depression Scale (HADS) to measure mood, and the Attention Network Test (ANT) to measure efficiency of the attentional networks of alerting, orienting, and executive control. This data was collected at baseline (prior to starting the intervention), eight weeks, and twenty-four weeks. The study was carried out using the mindfulness-based stress reduction program, eating meditation, body scan, mindful breathing, sitting meditation, walking meditation, mindful movement through hatha yoga, guided meditations, and loving kindness meditation. Each of these components were guided with video demonstration and narration that was uploaded into the university's learning management system. The participants were encouraged to practice components at least one day during the week and write about their experiences via an online class discussion forum.

At the conclusion of the eight weeks, the participants were sent the PSS, HADS, and ANT via an online link provided through email. The results of the study revealed that nursing students' stress was found to be significantly reduced according to the PSS measures (Sparado & Hunker, 2016). The intervention was shown to have moderate effects on the participants' stress with additional reduction in stress based on meditation practice frequency, as there was greater reduction in stress the more the participants practiced. Mood was evaluated via the HADS and the results showed the intervention was generally effective in reducing anxiety, and thus, positively influencing mood. Additional measures were taken which determined that the mindfulness intervention

elicited minimal reduction in anxiety specifically when practice of mindfulness was done less than once a month versus weekly practice, as weekly practice has proven to be statistically significant in reducing anxiety. When reviewing cognition Spardo & Hunker (2016) found that the findings were consistent with other studies showing that alerting response time does not change, but both the function of orienting and executive control demonstrated a decrease in response. Also, it was shown that there was an improvement in orienting, which shows that mindfulness strengthens the ability to shift attention (Spardo & Hunker, 2016).

Additionally, the cognition component of the ANT results also showed that there were improvements in accuracy and executive control following the eight-week intervention. It is clear to see that the results from the research conducted by Spardo & Hunker (2016) provide significant findings that mindfulness-based programs are successful at decreasing stress in nursing students. The findings also suggest that students who complete the program for a longer period of time also have retention of the benefit, as there was greater stress reduction in those who carried out the mindfulness-based program for the twenty-four-week period. Although there were limitations of a small sample size, inclusion/exclusion criteria, and assessment of student characteristics, not considering enrollment status and part-time versus full-time student stress, the study clearly shows remarkable evidence that suggests this intervention can be used to reduce stress in nursing students. In addition, Spardo & Hunker (2016) mentioned that not all students adapt well to the online environment. As online courses begin to emerge, faculty need to acknowledge this additional stressor and orient the students to the online learning environment, while also offering online mindfulness-based stress reduction programs like

this one to mitigate stress, increase mood, and improve cognition in nursing students.

Patterson (2016) conducted research to determine the efficacy of emotional freedom technique (EFT) as an intervention to relieve stress and decrease anxiety in nursing students. There has been growing interest in the role of energy or biofield therapies and using these methods to reduce anxiety and promote well-being. EFT is similar to other energy-based therapies like reiki and healing touch, while also being compared to acupuncture. EFT is a repetitive taping motion of the meridian points with a focus on the object that is feared by the individual or the negative emotion being experienced by the individual to provide desensitization. The individual repeats the repetitive motion, while also repeating a statement of acceptance which contributes to the cognitive re-wiring of the individual so that the negative thoughts can be corrected. Further research has shown that tapping of the meridian points relieves stress while also aiding in the self-acceptance of the fear. Patterson wanted to determine how EFT works on nursing students, as there is a literature gap in this area, and EFT could potentially be a very successful technique that nursing students could apply to their lifestyle.

Patterson's research study was a mixed design with quantitative and qualitative approaches, using a quasi-experimental time series pre-test and post-test design for the quantitative portion and a study short-answer questionnaire for the qualitative portion. The focus was on a hospital-based associate degree nursing program in the southeast region of the United States with 39 students participating. The participants were a convenience sample of 39 students, and each student was recruited by means of college newsletter, email invitations, electronic means, and poster displays. Using EFT, the study was conducted by having the participants meet for a pilot introductory session where EFT

32

would be explained. Next, the participants manually tapped the acupressure meridian points on the head, face, neck, chest, and hands while verbally confronting the fear/stressor by repeating the phrase, "Even though I have this feeling of stress and anxiety, I deeply and completely accept myself." After initially completing one round of EFT, the individuals were then told to shorten the repeated phrase to say, "This feeling of anxiety, stress…" and continue the EFT until anxiety is decreased. A follow-up session was conducted at one week, then at two weeks where participants would meet as a group to discuss the intervention. After this discussion, the group would break off, and at week three the participants would complete the intervention independently while completing surveys remotely.

The final group session, week four, consisted of Patterson (2016) collecting the research data via the State-Trait Anxiety Inventory (STAI), the PSS, and a qualitative questionnaire. The STAI was used to measure state and trait anxiety, while the PSS was used to measure perceived stress. Although there were 39 participants initially, a duplicate case was identified in demographic data collected, shrinking the sample size to 37. The study found that the majority of the nursing students were in the intermediate level of the nursing program. Data collected during baseline, week two, and week four showed a decrease in PSS score mean from baseline in weeks two and four, representing a 23.8% decrease in anxiety as measured by the PSS (Patterson, 2016). According to the STAI results, when comparing week two results to week four results, it was found that there was a 34.2% decrease in anxiety when the intervention was consistently practiced. The qualitative results showed that students felt calmer and more relaxed after using EFT. In addition, others reported improved sleep, immediate calming and tension-relief, a

decrease in somatic symptoms, increased control, better mood, and better ability to cope with stress after four weeks of using this method (Patterson, 2016).

Although Patterson (2016) had limitations in the study, such as the small sample size, potential for selection bias due to convenience sampling, and lack of male gender in the sample of participants, Patterson had significant research findings. EFT was shown to effectively reduce anxiety relative to baseline as measured by the PSS, STAI, and a qualitative survey. There was statistical significance that stress was decreased from baseline to week four, while the research also showed that the reduction in STAI trait scores from baseline compared to week four was also considerable. Additionally, other research has shown that EFT has successfully decreased anxiety in other populations and settings such as veterans, phobic individuals, athletes, and those with fibromyalgia. With all of these factors in mind, it is evident that EFT can be used as another intervention for successful stress management and anxiety-relief in nursing students.

Al et al. (2017) conducted a study to determine the stress level and coping strategies used among Saudi female nursing students during their clinical education. The study design consisted of a descriptive correlational cross-sectional design. Data was collected via a survey among female undergraduate nursing students enrolled in clinical training at King Saud Bin Abdulaziz University for Health Sciences. The study consisted of a sample size of 121 female Saudi undergraduate nursing students registered in their second semester and enrolled in at least one course. Using characteristics of demographic data such as age, marital status, employment status, GPA, academic credit hours, university level, number of clinical courses, registration status, and previous clinical training courses, data was gathered on the participants. Additionally, the PSS and the

Cognitive Behavior Inventory were used to measure stress levels and coping behaviors among the nursing students.

Using descriptive statistical analysis for the survey questionnaires, Al et al. (2017) had significant findings from the research. According to the demographic findings, the mean age was 21.4 years, all of the students were Muslims, a majority of the students were single, and most students (95.7%) were unemployed (Al et al., 2017). The PSS showed that stress from taking care of the patients, stress from teachers and nursing staff, and stress from the assignments and workload were recorded as the highest stressors among the nursing students. Meanwhile, stress from lack of professional knowledge and stress from the clinical environment were ranked as the lowest. The most frequently ranked stressors included clinical practice affecting extracurricular activities, worrying about bad grades, and the content of the clinical practice exceeding physical and emotional endurance (Al et al., 2017). When reviewing the coping strategies used by nursing students, the most frequently used coping strategies were the problem-solving strategy followed by the avoidance coping strategy. Additionally, the most frequently reported coping behavior included having confidence in overcoming the difficulties, and keeping optimistic while having a positive attitude to deal with everything in life (Al et al., 2017).

When using a Pearson test to examine the correlation between stress and coping amongst the Saudi nursing students, the researchers found a low negative-significant relationship between total PSS score and the problem-solving coping strategy subscale score. This means that students who used the problem-solving coping strategies experienced lower levels of stress. When comparing the stress, coping strategy, and

demographics of the nursing students, it was found that there was a positive-significant relationship between student's GPA and stress from providing patient care, which indicated that students with a high GPA experienced high levels of stress when providing care to patients. Furthermore, it is evident that Al et al. (2017) found significant data regarding stress in nursing students and particular coping strategies that are most effective.

Despite the study's limitations of a convenience sample and lack of variability between settings, the research provided emphasizes the significance of clinical instructors and nursing faculty recognizing the stressors that nursing students face and offering a means to cope with these stressors. Nursing students need an intervention to cope with their stress, as without effective coping, stress continues to build and lead to negative health outcomes. Nursing students need to feel prepared to deal with stressful situations after graduating from nursing school, as stress is a common finding amongst even the most experienced nurses in the field. With the growing demand for more nurses, it is vital that nursing faculty, clinical preceptors, and students work together to create programs and/or extra measures to decrease the stress that nursing students experience and provide optimal, effective strategies for these students to manage their stressors.

It is evident that nursing students are prone to stress. However, what is not evident is the various methods that nursing students can use to cope with the stress experienced in the academic and clinical setting. The literature reviewed showed that of the studies conducted, many found a variety of coping mechanisms to be effective. A common stress-relief tactic used by nursing students that was found to be effective in the research studies conducted was mindfulness-based therapies involving some sort of relaxation,

yoga, or energy-transference (Patterson, 2016; Spadaro & Hunker, 2016; Turner & McCarthy, 2017). Additionally, two literature reviews provided evidence of animal-based therapies, which were shown to be beneficial in decreasing stress in nursing students as well as other college students (Delgado et al., 2018; Turner & McCarthy, 2017). The most significant finding amongst all of the literature that discussed stress-relief interventions for nursing students was the conclusion that interventions to relieve stress are not being promoted by nursing faculty and clinical preceptors (Al et al, 2017; Delgado et al., 2018; Patterson, 2016; Spadaro & Hunker, 2016; Turner & McCarthy, 2017). The consensus is that there is little support for nursing students when it comes to relieving academic and clinical stress. With additional support from faculty and preceptors to develop stress-relief programs and tactics for both academic and clinical setting, nursing students could better manage their stressors, and thus, ultimately perform better in both disciplines.

Limitations/Gap in the Literature

The literature review that currently exists regarding stress in undergraduate nursing students is profound. There is a vast amount of credibility surrounding the notion that nursing students face high levels of stress throughout their nursing curriculum. Though the research obtained through examining the literature is significant, there are limitations with current and past literature that are worthy of noting. Many of the research studies were conducted within one setting (Admi et al., 2018; Al et al., 2017; Allen, 2018; Delgado et al., 2018; He et al., 2018; Patterson, 2016; Rathnayake & Ekanayaka, 2016; Sarafis et al., 2016; Spardo & Hunker, 2016; Turner & McCarthy, 2017) which limited diversity and variability. Several studies reported limitations of small sample sizes (Delgado et al., 2018; Patterson, 2016; Rathnayake & Ekanayaka, 2016; Sarafis et al., 2016; Spardo & Hunker, 2016; Turner & McCarthy, 2017).

Another limitation that was common amongst the literature was use of convenience sampling (Al et al., 2017; Delgado et al., 2018; Turner & McCarthy, 2017) and use of a cross-sectional study design (Admi et al., 2018; He et al., 2018; Rathnayake & Ekanayaka, 2016). Additionally, there were two studies that had limitations of research being performed outside of the United States (Al et al., 2017; Rathnayake & Ekanayaka, 2016). While many of the studies included academic year as a variable, none of the studies specifically compared students in their first clinical course with students in their last clinical course. Comparison of each of these cohorts can trend stress levels as the student progresses through the nursing program.

METHODS

<u>Purpose of Study</u>

The purpose of this study was to examine the levels of stress and student burnout in both sophomore and senior-level undergraduate nursing students at the University of Maine to determine whether stress is a common finding in the nursing program at this university, in addition to determining if stress is increasing, decreasing, or remaining the same throughout the course of the program. The study also examined the interventions utilized by undergraduate nursing students to relieve their stress and whether or not these interventions were currently effective. Additionally, the study identified what interventions the students believe should be incorporated into the program to allow for stress-relief.

<u>Research Questions</u>

1.) What is the perceived stress level in senior nursing students preparing to graduate in May 2019, and how does the level of stress experienced in senior nursing students compare to that of sophomore nursing students just beginning their medical-surgical nursing experience?

2.) What methods or interventions are sophomore and senior nursing students currently using for stress relief, and are these methods or interventions effective?

3.) What is the level of student burnout in senior nursing students preparing to graduate in May 2019, and how does the level of stress experienced in senior nursing students compare to that of sophomore nursing students beginning their medical-surgical nursing experience?

Hypotheses

1.) Sophomore nursing students will experience higher levels of stress in comparison to senior nursing students.

2.) Sophomore nursing students will experience higher levels of emotional exhaustion and cynicism, while experiencing lower levels of professional efficacy in comparison to senior nursing students who will experience lower levels of emotional exhaustion and cynicism, while experiencing higher levels of professional efficacy.

Study Design

A descriptive comparison study design was utilized to examine the levels of stress and student burnout in both sophomore and senior nursing students at the University of Maine. Open-ended questions were utilized to obtain information on interventions used to reduce stress and ideas for improvement in stress-relief within the current nursing program at the University of Maine.

Participant Eligibility

The sample for the proposed research was a convenience sample of sixty-nine sophomore nursing students and forty-one senior nursing students currently enrolled as undergraduates in the University of Maine, School of Nursing program. The two surveys were distributed to the students via paper format in the corresponding classes (NUR 200 for the sophomore students and NUR 456 for the senior students). Two additional open-ended questions were used to gather data on stress-relief interventions and suggestions for stress-relief improvement within the current curriculum. The participants had to provide their course number (either NUR 200 or NUR 456) for identification purposes,

but no other identifiable information was asked. There was no discrimination of

participants based on age, gender, or ethnicity.

<u>Study Instruments</u>

Two validated surveys were used: the Maslach Burnout Inventory Scale and the

Perceived Stress Scale. In addition to these two surveys, two brief open-ended questions

were provided on a separate sheet of paper. These questions encouraged the participants

to provide information on individual stress-relief interventions and the effectiveness of

those interventions as well as share ideas on what interventions could be incorporated

into the current program to relieve undergraduate nursing students' stressors. The data

was analyzed and scored based on scoring methods used for the specific instrument of

measurement as well as through use of Independent Sample $t$-Tests to analyze the data

via SPSS version 25.

<u>Maslach Burnout Inventory Scale</u>

The MBI- General Survey for Students Scale (see Appendix A) is a study

designed for the use of adult students in college to measure burnout from the perspective

of one's performance with work in general. This survey is self-administered, and has

been a reliable tool that is valid, easy to use, and takes only about ten to fifteen minutes to

complete. The survey consists of sixteen items that are clustered into three different

subscales: professional efficacy, exhaustion, and cynicism (Jones, Hansen, Kaddoura,

Schwab-McCoy, & Tocchini, 2018). Professional efficacy within the study is a measure

of the satisfaction with past and present accomplishments, while assessing the individuals

expectations of continued effectiveness at school. The exhaustion part of the survey seeks

to measure feelings of being overextended and exhausted by one's studies. Lastly, the

cynicism part of the study measures indifference or distant attitudes towards the participants' studies (Mind Garden, n.d.).

While completing the survey, the participants have the option of choosing between seven answer options: never, a few times a year or less, once a month or less, a few times a month, once a week, a few times a week, and every day. Each of these options are then given a corresponding score between 0-6 with "never" equating to a score of 0 and "everyday" equating to a score of 6. There are five questions on emotional exhaustion, five questions on cynicism, and six questions on professional efficacy. In the end, a total score for each individual section (emotional exhaustion, cynicism, and professional efficacy) can be gathered and the information can be analyzed (Mind Garden, n.d.).

The Perceived Stress Scale

The PSS (see Appendix B) is one of the most widely used and distributed psychological instruments for measuring the perception of stress. This instrument consists of a 10-question questionnaire that is both reliable and valid, and requires a short amount of time to complete (roughly 10-15 minutes). The scale serves to measure the degree to which the individual feels situations in one's life are stressful, while also focusing on how unpredictable, uncontrollable, and overloaded the participants find their lives to be. Questions within the PSS ask the participants to share feelings and thoughts during the last month, and the survey does so by asking the respondents how often they have felt a certain way. The participants have the option of choosing from five answer options: never, almost never, sometimes, fairly often, and very often (Jones et al., 2018).

This study scale yields a single score, with high scores indicating higher levels of stress and low scores indicate low amounts of stress. Each answer option has an assigned score ranging from never (0) to almost always (4). The positively-worded responses are reverse scored (e.g. 0=4, 1=3, 2=2, 3=1, & 4=0) with the four positively-worded items being question 4, 5, 7, & 8, and then the ratings are summed across all scale items. A short four-item scale can be made from questions 2, 4, 5, and 10 of the PSS 10-item scale. Interpretation of the scores is based off of the interpretation that a score of 0-7 is very low stress, while a score of 8-11 is low stress, a score of 12-15 is average stress, a score of 16-20 is moderate stress, and a score of 21+ is very high stress (Cohen, Kamarack, & Mermelstein, 1983).

<u>Data Analysis</u>

An Independent Samples *t*-Test was used to analyze the data from each of the two surveys. Independent Samples *t*-Test compares the means of two independent cohorts in order to determine whether there is statistical evidence that the mean measures of the populations are statistically different. In each sample of students, the sophomore and senior undergraduate nursing students, there is no relationship between the two, nor is there any influence from either member of each group (Kent State University, n.d.). Descriptive statistics was also used to provide basic information about variables within the data set, while also highlighting the relationship between the variables within the set (The Regents of the University of Michigan, n.d.). Using SPSS version 25 software, the information was then entered into the system and calculated. SPSS is a statistical software program for managing data and calculating statistics. It covers the basis of

common statistics, regression, and graphs (The Regents of the University of Wisconsin, 2016).

<u>Two Additional Questions</u>

Two additional open-ended questions were provided on a separate sheet of paper that was handed out to the students along with the two surveys. The open-ended questions gave the students the opportunity to express current stress-relief methods and whether or not they felt these methods were effective. Additionally, the students were also given the opportunity to share opinions and ideas for the school of nursing to incorporate stress-relief for the students. The two questions provided to the participants within the study were written as follows:

1.) Indicate what interventions are currently being used to relieve stress and are these interventions effective?

2.) What interventions would you like to see incorporated into the nursing program to help students deal with stress?

The answers to these questions were then analyzed to determine common themes and trends reported by the students who participated.

<u>Protection of Human Subjects</u>

A proposal was submitted to the Institutional Review Board (IRB) at the University of Maine, Orono. This study received feedback, revisions were made, and a final approval was given to begin the research process. This study was deemed exempt from further review under category two of the regulations, and no further review was required. The only risks to students were their time and the potential that they might be

uncomfortable answering some of the questions. Students were informed that they could skip any questions that they did not feel comfortable answering.

Confidentiality

Upon obtaining approval from the University of Maine IRB, students were invited to participate in the study and informed that their answers would remain anonymous. In order to maintain anonymity, no identifiable information was collected (e.g. name, gender, age). Students were asked to only identify the course they were currently enrolled in (NUR 200 or NUR 456). Once the students had the opportunity to complete all surveys, they would come to the front of the class to place it into a collection box. All of the surveys were then taken to the faculty advisor's office so that the data obtained could be entered into SPSS version 25. Paper surveys were kept in a locked cabinet and destroyed once data was entered into SPSS. De-identified data was kept on a secure computer.

Survey Distribution

All of the surveys were distributed on Monday, March 11th, 2019 at the University of Maine, Orono. The surveys were given to the sophomore-level students and the senior-level students, respectively. All of the students were read a script (see Appendix C) that specified the study and data collection and all students were also given the opportunity to view the consent to participate in the research study. Since the two classes were running concurrently, the faculty advisor was present during the distribution of the research tools to the sophomore-level students and remained there to answer questions and collect all completed surveys. The principle investigator was present during the distribution of the

45

research tools to the senior-level nursing students and was present until all of the students

completed their surveys and all surveys were collected.

RESULTS

The study consisted of second semester sophomore-level undergraduate nursing students and second semester senior-level undergraduate nursing students enrolled at the University of Maine for the Spring of 2019. The demographics of each cohort were as follows:

*Sophomore-Level Undergraduate Nursing Students*

- Anticipated graduation date of May 2021

- Class size of 69 students

- Age range of 19 to 22-years-old

- Gender was predominantly female with a handful of male students

- Generally, all students were in good health

- Ethnic group was predominantly Caucasian

*Senior-Level Undergraduate Nursing Students*

- Anticipated graduation date of May 2019

- Class size of 42 students

- Age range of 21 to 22-years-old

- Gender was predominantly female with only 2/42 male students

- Generally, all students were in good health

- Ethnic group was all Caucasian

- 

**Table 1: Sample**

| Level of Education | Course Enrollment | Invited to Participate | Participated | Completed | Response Rate |
|---|---|---|---|---|---|
| **Sophomores** | 69 | 61 | 61 | 59 | 96.7% |
| **Seniors** | 42 | 36 | 36 | 36 | 100% |

Note: Students not present in the class were missing due to illness or personal commitments. These students were similar in demographics to those who participated in the study.

Reliability

Both the PSS and the MBI Scale demonstrated acceptable reliability. The cynicism subscale for the senior students was reported lower, which is likely due to lower levels of cynicism in this particular cohort. Please refer to both table 2 and table 3 for these results.

**Table 2: Reliability of the Perceived Stress Scale**

| | Chronbach Alpha | N |
|---|---|---|
| **All Students** | 0.912 | 95 |
| **Sophomores** | 0.895 | 59 |
| **Seniors** | 0.904 | 36 |

**Table 3: Reliability of the MBI Scale**

| | Total Scale | Exhaustion Subscale | Cynicism Subscale | Professional Efficacy Subscale | N |
|---|---|---|---|---|---|
| **All Students** | 0.764 | 0.901 | 0.865 | 0.746 | 96 |
| **Sophomores** | 0.726 | 0.900 | 0.835 | 0.728 | 60 |
| **Seniors** | 0.797 | 0.886 | 0.597 | 0.791 | 36 |

The Perceived Stress Scale

The mean scores for all students and for individual cohorts were higher than the normal table established by Cohen and Williamson (1988). More than one quarter of all students had high perceived stress scores. More than one third of the students in the sophomore student cohort had high perceived stress scores (see table 4).

**Table 4: Mean and Frequencies of the Perceived Stress Scale**

| | Range | Mean | SD | Low (0-13) N | Low % | Moderate (14-26) N | Moderate % | High (27-40) N | High % | N |
|---|---|---|---|---|---|---|---|---|---|---|
| **Norm Ages (18-29)** | | 14.2 | 6.2 | | | | | | | |
| **All Students** | 2-37 | 19.35 | 6.4 | 12 | 12.63% | 58 | 61.05% | 25 | 26.32% | 95 |
| **Sophomores** | 2-37 | 21.35 | 5.87 | 4 | 6.78% | 34 | 57.63% | 21 | 35.59% | 59 |
| **Seniors** | 3-33 | 16.09 | 6.24 | 8 | 22.22% | 24 | 66.67% | 4 | 11.11% | 36 |

Note: Norm table from Harris Poll of 2,387 respondents in the United States. From "Perceived Stress in a Probability Sample of the United States," by S. Cohen and G. Williamson, 1988, in S. Spacapan and S. Oskamp (Eds.), *The Social Psychology of Health,* Newbury Park, CA: Sage

A *t*-Test for Independent Samples was run to compare each of the cohorts on total scale scores and individual questions (see table 5). The sophomore nursing students had significantly higher levels of overall stress than the senior nursing student cohort. The nursing students felt less confident in ability to handle personal problems, while also feeling that things were not going their way. The students have felt unable to cope with

all of the things that they have had to do, have felt less able to control irritations in their lives, have not felt that they were on top of things, and have felt that difficulties were piling up so high that they could not overcome them.

**Table 5: *t*-Test for Independent Samples (Perceived Stress Scale)**

|  | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Mean Scale | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Significance** | 0.295 | 0.144 | 0.000* | 0.000* | 0.001* | 0.000* | 0.002* | 0.000* | 0.069 | 0.000* | 0.000* | |
| **Sophomores** | 2.25 | 2.21 | 3.7 | 1.75 | 2.15 | 2.61 | 1.85 | 2.23 | 2.41 | 2.8 | 21.35 | 59 |
| **Seniors** | 2.03 | 1.85 | 3.0 | 1.17 | 1.61 | 1.42 | 1.31 | 1.56 | 1.97 | 1.69 | 16.09 | 36 |

Note: Significance at 0.01. All items with * are considered significant.

Maslach Burnout Inventory General Student Survey Scale

For the purpose of this study, scores for the subscales were grouped into 0-10 (low emotional exhaustion, low cynicism, and low professional efficacy), 11-20 (moderate emotional exhaustion, moderate cynicism, and moderate professional efficacy), and 21-30 (high emotional exhaustion, high cynicism, and high professional efficacy). Higher scores on the emotional exhaustion and cynicism subscales and lower scores on the professional efficacy subscale indicate burnout. Both cohorts had high levels of professional efficacy. Eighty percent of the sophomore students had high levels of emotional exhaustion compared to fifty-eight percent of the senior students. Eighteen percent of the sophomore students had high levels of cynicism compared to eight percent of the senior students (see table 6).

A *t*-Test for Independent Samples was run to compare the two cohorts levels of emotional exhaustion, cynicism, and professional efficacy. The sophomore student cohort had significantly higher levels of emotional exhaustion and cynicism than the senior

student cohort. There were no differences found between the two cohorts in regards to

professional efficacy subscale scores.

**Table 6: Mean and Frequencies of the Maslach Burnout Inventory Scale**

| Exhaustion Subscale | Range (0-30) | Mean | SD | 0-10 N | 0-10% | 11-20 N | 11-20% | 21-30 N | 21-30 % | Significance 0.015* | N 97 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sophomores | 1-30 | 19.48 | 4.77 | 2 | 24% | 10 | 16% | 49 | 80% | | 61 |
| Seniors | 7-30 | 16.99 | 4.76 | 3 | 8.3% | 12 | 33% | 21 | 58% | | 36 |
| | | | | | | | | | | | |
| Cynicism Subscale | Range (0-30) | | | | | | | | | Significance 0.002* | 96 |
| Sophomores | 1-29 | 12.21 | 5.99 | 20 | 33.3% | 29 | 47.5% | 11 | 18% | | 60 |
| Seniors | 0-28 | 8.08 | 6.37 | 23 | 63.9% | 10 | 27.8% | 3 | 8% | | 36 |
| | | | | | | | | | | | |
| Professional Efficacy Subscale | Range (0-36) | | | | | | | | | Significance 0.193 | 96 |
| Sophomores | 15-35 | 22.30 | 4.07 | 0 | 0 | 9 | 15% | 51 | 85% | | 60 |
| Seniors | 18-36 | 23.45 | 4.34 | 0 | 0 | 5 | 14% | 31 | 86% | | 36 |

Note: Significance at 0.05 and 0.01. All items with * are considered significant.

Pearson correlations were run to see if there were any relationships between

perceived stress scores and subscale scores on the MBI Scale. For all of the students,

higher perceived stress was correlated with higher emotional exhaustion and lower

professional efficacy. For the sophomore students, higher perceived stress was correlated

with higher emotional exhaustion (see table 7).

**Table 7: Pearson Correlation Mean Perceived Stress and MBI**

| Mean Perceived Stress | Mean Exhaustion | Mean Cynicism | Mean Professional Efficacy |
|---|---|---|---|
| All Students (N=96) | | | |
| Pearson Correlation | .271* | .191 | -.215* |
| Sig (2-tailed) | .008 | .065 | .037 |
| Sophomores (N=60) | | | |
| Pearson Correlation | .331 | .088 | -.092 |
| Sig (2-tailed) | .010* | .511 | .490 |
| Seniors (N=36) | | | |
| Pearson Correlation | -.012 | .048 | -.295 |
| Sig (2-tailed) | .945 | .779 | .081 |

Note: Significance at 0.05 and 0.01. All items with * are considered significant.

<u>Open-Ended Questions</u>

Two open-ended questions that were distributed separately from the two surveys asked about stress-relief interventions, effectiveness of those interventions, and ideas for future intervention implementation in the nursing program at the University of Maine. The first question was individual-based, as it asked the participants to share what interventions they currently use to cope with stress and describe whether these interventions are effective. The second question was also individual-based, but allowed the participants to share thoughts and ideas about stress-relief interventions that the nursing program could implement to help students cope with their stressors.

*Question One:*

When asked question one, "Indicate what interventions are currently being used to relieve stress and are these interventions effective?," the students had varied responses that pertained to individual preferences for stress-relief. When examining the responses, common themes were found. For the sophomore students, the most common forms of

stress-relief interventions included going to the gym/exercising, spending time with friends/family, participating in some sort of relaxation/self-care (e.g. taking a vacation, bathing/showering, riding horses), and taking a nap or sleeping. It was found that 25 out of the total 56 students use the gym/exercise, 15 out of the 56 students use friend/family, 22 out of the 56 students use relaxation/self-care, and 12 out of the 56 students use napping or sleeping for stress-relief. Other forms of stress-relief that were not as common amongst the entire cohort included use of television (TV), music, or reading for distraction (11/56), yoga (5/56), and proactive studying and working ahead (8/56).

When examining how effective the interventions were, it was found that some of the students did not list whether the interventions were effective or not, while others listed a variety of interventions, but did not specify which intervention was effective. A total of 29 students responded to the second part of the question, mentioning that their listed intervention was either effective, somewhat, but not always effective, or not effective at all. Of the 29 students, 14 students felt that their current stress-relief interventions are effective, 13 students felt that their current stress-relief interventions are somewhat, but not always effective, and 2 students specifically mentioned that current stress-relief interventions are not effective at all. It was also interesting to find that 6 out of the total 56 sophomore students felt that they did not have any time to participate in some sort of stress-relief intervention. Two students mentioned that the current nursing school at the University of Maine does not do anything to help the students relieve their stressors.

In comparison to the sophomore nursing students, when asking the senior nursing students to answer question one, 35 total nursing students responded. Of the 35 students,

19 students mentioned gym/exercise for stress-relief, 18 students mentioned relaxation/self-care (e.g. taking trips, bathing/showering, extracurricular activities), 14 students mentioned spending time with family/friends, and 13 students mentioned TV, music, or reading for distraction stress-relief. This evidence shows that the majority of students in both cohorts rely on the gym/exercise to relieve stress, while relaxation and self-care practices are also a commonly used stress-relief intervention that is personal to the individual. Having a social life and surrounding oneself with family and friends is also a common finding between both cohorts. It is interesting to find that 11 out of the total 56 sophomore nursing students (approximately 20%) use distraction techniques (e.g. TV, music, reading) for stress-relief, while a higher percentage of senior nursing students (approximately 37%) use this technique for stress-relief. Other stress-relief techniques mentioned by the senior nursing student cohort included yoga (4/35), spending time with animals (3/35), taking medication (3/35), and eating food (4/35).

After analyzing the responses and determining how many students responded to whether or not the stress-relief interventions currently being used are effective, somewhat, but not always effective, and not effective at all, it was found that 18 of the 35 senior nursing students responded. Of these 18 students, it was found that 10 students felt that their current stress-relief interventions were effective, while 8 of the students found their stress relief-interventions to be somewhat, but not always effective. There were no students who mentioned any of the stress-relief techniques not being effective. There were also no senior nursing students who mentioned not having any time for completion of stress-relief interventions. These students did, however, mention that they focus on "making time" for themselves. In comparison to the 2 sophomore students who

mentioned that the nursing program does not support students stress-relief, 1 student in the senior nursing student cohort also mentioned that the University of Maine does not support the students' mental health and does not provide stress-relief.

*Question two:*

Question two asked the students, "What interventions would you like to see incorporated into the nursing program to help students deal with stress?", and a variety of responses were recorded. For the sophomore nursing student cohort, it was found that many of the students (25 out of the 50 students who responded to this question) felt that there needs to be more clear explanations, expectations, communication, and guidance. This means that half of the students who responded to this question felt that this is an issue in the nursing program. Additionally, 19 of the 50 students mentioned that they feel they are either disrespected, unsupported, and are unable to approach professors with questions. Some of the students provided feedback on specific interventions that can be implemented, such as study groups, where 9 out of the 50 students felt this would help with stress. Other reported findings include yoga and meditation being implemented (3/50), decreasing the amount of exams in one week (4/50), and creating more time for the students/providing education on time management (3/50).

In comparison to the sophomore nursing students, the senior nursing students also provided feedback to this question. Out of the 32 students who provided feedback to this question, 10 of the senior nursing students felt that there needs to be better communication, coordination, and organization between classes and faculty. Additionally, 4 out of the 32 students felt that staff needs to be more encouraging and supportive. The senior nursing students mentioned other interventions that could be implemented into the nursing program to help students cope with stress. These

interventions included: providing seminar classes/debriefing classes (4/32), decreasing

"busy" or "pointless" work (6/32), providing fun events for the students to attend (e.g.

animal visits, free food, games) (4/32), providing more time management skills (4/32),

providing mentoring/study groups (7/32), and providing more information on stress-relief

and self-care earlier in the program (5/32).

DISCUSSION

The results of this study provide current evidence that suggests nursing students, both the sophomore and senior cohorts, at the University of Maine experience high amounts of stress, with the sophomore student cohort experiencing higher levels of stress. This data not only supports the hypothesis that sophomore nursing students would experience higher amounts of stress in comparison to the senior nursing students at the University of Maine, but also provides feedback that stress is more prevalent in underclassmen. The findings of this study are consistent with a study by Admi et al. (2018) who found that second-year preclinical students recorded significantly higher levels of stress, compared to third and fourth year students.

Though there are no clear explanations as to why the sophomore student cohort experienced higher levels of perceived stress than the senior student cohort, there are many suggestions as to why these results occurred. The sophomore student cohort is participating in their first medical-surgical nursing course, a course that has been found to be more academically challenging than other nursing courses in the curriculum. Medical-surgical nursing is where the students begin to connect-the-dots while they analyze the pathology of many diseases with fresh eyes. Another speculation as to why the sophomore students reported higher amounts of stress than the senior students is that the sophomore students are also enrolled in another difficult course, pathophysiology, which explores various diseases and disorders encountered in the nursing profession. Each of these courses are said to be two of the "most challenging nursing courses" according to

the University of Maine nursing faculty, as these courses are typically what makes-or-breaks the student.

While requiring much discipline to study for the exams in each of these courses, the sophomore students are likely still experiencing stress from adjusting to the role of a college student. This is their second year of college, and adjusting from the role of a student in high school to a student in college can be difficult to achieve in the first year. Many students are likely still developing new friendships, searching for new extracurricular activities, and finding new ways to adjust to the life of a college student. In addition, these students are likely experiencing the generalized stressors that most college students face, such as the stress from juggling work, family time, difficulties maintaining social relationships, and financial strains (He et al. 2018; Labrague et al., 2017; Senturk & Dogan, 2018). Being nursing students, these sophomores are facing additional pressures of both academic and clinical expectations, some of which include meeting expectations in the clinical setting, fear of harming patients, and fear of making mistakes (Admi et al., 2018; Labrague et al., 2017; Senturk & Dogan, 2018).

The senior nursing students are exposed to similar pressures, as they experience the academic and clinical stressors as well as the common stressors experienced by most college students. However, the difference lies in the experience that the students have had. For instance, the senior nursing students are now fourth-year, some fifth-year nursing students, where they have now completed the difficult courses, challenging exams, and most of their clinical experience. The senior students have had exposure to the clinical setting in a variety of ways through prior clinical experiences, outpatient visits, and partnership, and they have now had the opportunity to grow and advance their

clinical skills and expertise. In particular, the senior nursing students at the University of

Maine no longer have several weekly exams to study for, which relieves some of the

academic pressures. The senior cohort does, however, have the new pressures of finding a

job upon graduation in May and preparing for the National Council Licensure

Examination (NCLEX).

Though the seniors face these new pressures as they approach graduation, it

appears that the overall stress of nursing school has declined, as these students now see

the light at the end of the tunnel and only have a few months until freedom. These senior

students are likely experiencing triumph, as they know they are approaching graduation,

and if they can earn their Bachelor's degree in nursing, they can also conquer the NCLEX

and find a career, especially because there is a nursing shortage. This optimistic attitude

that these students have is much greater than the stress that they were once experiencing

when they were the sophomore nursing students trying to pass all of their difficult

courses.

The hypothesis that sophomore nursing students would have higher levels of

cynicism and emotional exhaustion and lower levels of professional efficacy was only

partially supported. The sophomore students reported statistically higher levels of

emotional exhaustion and cynicism than the senior students. The senior nursing students

reporting lower amounts of emotional exhaustion and cynicism is also expected, as these

students reported lower amounts of perceived stress than the sophomore cohort. These

students also have had more time to adjust to the structure of the nursing program, while

also having more time to establish relationships and rapport with professors.

Although, the senior student cohort did have higher levels of professional efficacy than the sophomore students, the results were not statistically significant. This suggests that although the sophomore students have higher levels of emotional exhaustion and cynicism, these students still maintained confidence in their ability to learn as well as confidence in the university's ability to educate them. The senior cohort likely have a strong sense of accomplishment as they prepare to graduate in May. Consistent with findings by Admi et al. (2018) that nursing students were satisfied with their major, but unsatisfied with their studies, students at the University of Maine did report dissatisfaction with aspects of their studies such as their perceived lack of support and communication from faculty.

The high amount of professional efficacy is demonstrated further as information was obtained on the current senior cohort that is graduating in May of 2019. The data obtained from the nursing faculty advisor shows that there were originally 46 students enrolled in NUR 200 in the spring of 2017 during their sophomore year. Thirty-five of those students progressed on time and are set to graduate in May of 2019. There were 2 students who withdrew from the course prior to it ending, and 9 additional students did not progress with their class. However, of the 11 students who either withdrew or did not progress, 8 students are still enrolled in the nursing program, just delayed with their progress. This information shows that high levels of professional efficacy can be seen amongst the nursing students at the University of Maine. These students who are continuing to persevere through the difficulties encountered in their NUR 200 course in the spring of 2017 show that they feel nursing is the career choice that fits them. This data suggests that support and encouragement from faculty, as well as better coordination

and communication may have helped these students progress with their studies, rather than withdraw or fail the course.

When it comes to stress-relief, the undergraduate nursing students at the University of Maine have similar thoughts and methods of conquering their stressors, as identified in the literature. Due to the average response from both cohorts being close to half of the participants who responded to the intervention's effectiveness being only somewhat, but not always effective, it is likely that both the sophomore and senior cohorts need more guidance with stress-relief interventions that are effective at managing student stress. It was found that the senior student cohort appeared to have a greater variety of stress-relief interventions than the sophomore students. These additional interventions could be introduced as options earlier in the program. The sophomore student cohort also appeared to mention working proactively or getting ahead of schoolwork as an additional stress-relief intervention. Study groups may be offered to assist students in developing strategies for managing academic load.

Many of the students from each cohort found that some of their stressors arise from the lack of communication, coordination, clear expectations, and explanations from nursing professors. The senior student cohort reported less trouble with respect and encouragement from professors, while also reporting less issues regarding communication, coordination, clear expectations, and explanations, which may be a result of being fourth-year and fifth-year students with prior knowledge and experience with these issues. This cohort may have had time to adjust to these stressors, while also developing better relationships with the professors as they moved through the curriculum.

Thus, faculty can implement strategies earlier in the program to assist students in forming these professional relationships.

Literature analysis on stress-relief interventions for nursing students has shown that interventions are not always being promoted by nursing faculty and clinical preceptors (Al et al, 2017; Delgado et al., 2018; Patterson, 2016; Spadaro & Hunker, 2016; Turner & McCarthy, 2017). Though not specifically mentioned by several students in the study, one student from the senior cohort specifically mentioned, "The school does nothing," when asked to describe interventions currently being used to relieve stress. Many of the students hint that there needs to be a better system for stress-relief in the nursing program at the University of Maine through their responses, as they shared specific ideas and thoughts about future incorporation of interventions in this program.

Several specific suggestions were made to improve student stress. The most commonly mentioned stress-relief intervention was to promote study groups/mentoring programs. Other suggestions included decreasing the amount of exams in a week, providing feedback on time-management and addressing self-care earlier on within the program. Students expressed the need to reduce "busy work." This suggests that faculty may need to do a better job of relating course assignments to student learning outcomes.

Implications for Nursing Practice and Future Research

It is imperative that the nursing faculty and students work together to enhance the current nursing program at the University of Maine so that it will be beneficial to students in relieving their stressors. As the current study has shown, nursing students, particularly those who are sophomore students encountering their first medical-surgical courses, as well as learning pathophysiology, are prone to high amounts of stress. Additionally, even

as seniors reach the end of their program, these students are still experiencing moderate-to-high amounts of stress. The stress experienced by these students contributes to poor mental health and decreased cognition, which is vital to the success of these students as they progress throughout the program. The nursing students in the sophomore cohort, as well as the senior cohort have expressed interest in receiving more support and encouragement from nursing professors as well as more implementation of stress-relief interventions early-on and throughout the program.

This study was a descriptive, comparison study that yielded some specific interventions that students suggested might help to relieve stress. Intervention studies can be designed to test the effect of specific interventions such as study groups, time management strategies, communication strategies, and self-care management on student stress levels. In addition, this study was a cross-sectional study conducted at one point in time. A longitudinal study, following a cohort of students through their program of study could yield valuable information on how student stress changes over time.

Limitations

This study has several limitations. Some of the limitations included conduction of the study in one setting, as was also a limitation in several literature studies examining stress in undergraduate nursing students (Admi et al., 2018; Al et al., 2017; Allen, 2018; Delgado et al., 2018; He et al., 2018; Patterson, 2016; Rathnayake & Ekanayaka, 2016; Sarafis et al., 2016; Spardo & Hunker, 2016; Turner & McCarthy, 2017). Conducting this research in one setting limits the diversity and variability of the results. Additionally, though the response rates for the surveys were high, the sample sizes for each cohort were not large.

Each cohort was also different, as one cohort was composed of sophomore students, while the other was composed of senior students. This means that each of the students could have had varying experiences that impact their stress levels. There is also a lack of diversity in gender, with both cohorts being primarily composed of females. Another limitation of this study is that it was a descriptive comparison, cross-sectional study design using a convenience sample of nursing students during their sophomore and senior year. A follow-up study following the sophomore cohort through the remainder of their program could yield some interesting findings. The survey method using the Perceived Stress Scale is a limitation as well, considering this survey is not specific to college students. In addition, the Maslach Burnout Inventory General Student Survey Scale that was used for surveying was not specific to nursing students. One last limitation of the study was the potential bias that the faculty advisor and researcher may have produced, as having a nursing faculty member and nursing student involved in this research may have influenced the honesty of responses.

CONCLUSION

With the knowledge that undergraduate nursing students experience high amounts of stress as they progress throughout their program, research to determine effective stress-relief interventions is necessary to combat the negative health outcomes of excessive, prolonged stress. The findings within this research study support the need for implementation of stress-relief interventions at the University of Maine for the undergraduate nursing students. Implications for future research include developing stress-relief tactics for the undergraduate nursing students at the University of Maine to target the high amounts of stress that these students are experiencing. Future research can consist of developing stress-relief interventions, and evaluating the individual student stress as they progress throughout the program, determining whether or not these interventions are effective and making necessary changes to the interventions, as needed.

It is important to determine what works for the students at the University of Maine, as reducing student stress and anxiety could impact mental health, comprehension, and retention of information in their courses, while also preventing nursing students from dropping out of the program or switching majors. If stress-relief interventions are a focus early-on, the students can use these interventions to cope with and manage their stressors as they progress through challenging courses and prepare for their NCLEX and future careers. Due to the nature of stress also being present in their future careers, it is critical that these students learn to manage their stressors now so that they can be successful nurses upon graduation.

With the support from nursing faculty, professors, and students, the undergraduate nursing students at the University of Maine can combat their stressors using healthy

techniques that could benefit not just themselves, but other collogues at this University. Nursing students are seeking a career that emphasizes the importance of health and well-being, involving both the physical and mental entities that comprise the entire holistic model of health care. As these students are being taught the significance of maintaining healthy bodies and minds, they are experiencing stress and are struggling to find interventions that target this stress. Why should the mental health of the students be compromised while they are being educated on the significance of maintaining health? In order for these students to rise above the stress encountered when receiving education to work as future health care providers, the students need guidance and support from professors and staff within the nursing curriculum. With the encouragement from professors, willingness of staff to intervene, and dedication of students, stress does not have to be a deterrent to earning their degree.

Though stress is unavoidable, it can be decreased to manageable levels. It is essential that the nursing faculty at the University of Maine understand the significance of stress and its impact on their students. Stress, in some instances, can be a positive emotion. More often than not, these students are experiencing the negative effects of stress, which is decreasing their concentration, comprehension, and abilities to critically think, as nurses are required to do. The future of nursing depends on compassionate, dedicated students that are able to critically think and understand all aspects of patient care. The benefits of intervening to establish effective stress-relief tactics that work for all undergraduate nursing students will be reflected on not only the students, but the nursing faculty. Nursing students will be able to gain the most experience from their education, without stress hindering their full potential.

References

Admi, H., Moshe-Eilon, Y., Sharon, D., & Mann, M. (2018). Nursing students' stress and satisfaction in clinical practice along different stages: A cross-sectional study. *Nurses Education Today, 68*, 86-92. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nedt.2018.05.027

Al, G. E., Alhosain, A., & Alsunaye, K. (2018). Stress and coping strategies among Saudi nursing students during clinical education. *Perspectives in Psychiatric Care*, 54(2), 198–05. https://doi-org.prxy4.ursus.maine.edu/10.1111/ppc.12223

Allen, M. L. (2018). Examining nursing students' stress in an end-of-life care simulation. *Clinical Simulation in Nursing*, 14, 21–28. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.ecns.2017.10.006

American Heart Association (AHA). (2017). Lower stress: How does stress affect the body? Retrieved from http://www.heart.org/en/healthy-living/healthy-lifestyle/stress-management/lower-stress-how-does-stress-affect-the-body

American Institute of Stress (AIS). (n.d.). Stress effects. Retrieved from https://www.stress.org/stress-effects/

Cohen, S., Kamarack, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386-396. https://uwm.edu/mcwp/wp-content/uploads/sites/337/2016/01/Perceived-Stress-Scale-Tip-Sheet.pdf

Cohen, S. & Williamson, G. (1988). Perceived stress in a probability sample of the United States. *The Social Psychology of Health*. Newbury Park, CA: Sage.

Delgado, C., Toukonen, M., & Wheeler, C. (2018). Effect of canine play interventions as a stress reduction strategy in college students. *Nurse Educator*, 43(3), 149–153. https://doi-org.prxy4.ursus.maine.edu/10.1097/NNE.0000000000000451

Harvard University. (2018). Understanding the stress response. Retrieved from https://www.health.harvard.edu/staying-healthy/understanding-the-stress-response

He, F. X., Turnbull, B., Kirshbaum, M. N., Phillips, B., & Klainin-Yobas, P. (2018). Assessing stress, protective factors, and psychological well-being among undergraduate nursing students. *Nurse Education Today*, 68, 4-12. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nedt.2018.05.013

Jones, R. J. F., Hansen, M. M., Kaddoura, M., Schwab-McCoy, A., & Tocchini, K. (2018). The incidence of nursing students' perceived stress and burnout levels at a private university in California. *Journal of Nursing Education and Practice, 8*(10), 138-151. https://doi.org/10.5430/jnep.v8n10p138

Kent State University. (n.d.). Independent samples *t*-test. Retrieved from https://libguides.library.kent.edu/spss/independentttest

Labrague, L. J., McEnroe, P. D. M., Papathanasiou, I. V., Edet, O. B., Tsaras, K., Christos, K. F., & Lucas, K. V. S. (2017). A cross-country comparative study on stress and quality of life in nursing students. *Perspectives in Psychiatric Care, 54*(4), 469-476. https://doi-org.prxy4.ursus.maine.edu/10.1111/ppc.12248

Magnavita, N., & Chiorri, C. (2018). Academic stress and active learning of nursing students: A cross-sectional study. *Nurse Education Today, 68,* 128-133. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nedt.2018.06.003

Mind Garden. (n.d.). *MBI: General survey for students*. Retrieved from https://www.mindgarden.com/313-mbi-general-survey-for-students

Patterson, S. L. (2016). The effect of emotional freedom technique on stress and anxiety in nursing students: A pilot study. *Nurse Education Today*, 40, 104–110. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nedt.2016.02.003

Rathnayake, S., & Ekanayaka, J. (2016). Depression, anxiety and stress among undergraduate nursing students in a public university in Sri Lanka. *International Journal of Caring Sciences, 9*(3), 1020-1032. Retrieved from https://library.umaine.edu/auth/EZProxy/test/authej.asp?url=https://search-ebscohostcom.prxy4.ursus.maine.edu/login.aspx?direct=true&db=c8h&AN=123018408

Sarafis, P., Rousaki, E., Tsounis, A., Malliarou, M., Lahana, L., Bamidis, P., & Papastavrou, E. (2016). The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nursing, 15,* 1-9. https://doi-org.prxy4.ursus.maine.edu/10.1186/s12912-016-0178-y

Senturk, S., & Dogan, N. (2018). Determination of the stress experienced by nursing students' during nursing education. *International Journal of Caring Sciences, 11*(2), 896-904. Retrieved from https://library.umaine.edu/auth/EZProxy/test/authej.asp?url=https://search-ebscohostcom.prxy4.ursus.maine.edu/login.aspx?direct=true&db=c8h&AN=131851630

Spardo, K. C., & Hunker, D. F. (2016). Exploring the effects of an online asynchronous mindfulness meditation intervention with nursing students on stress, mood, and cognition: A descriptive study. *Nurse Education Today, 39,* 163-169. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nedt.2016.02.006

The Regents of the University of Michigan. (n.d.). Descriptive statistics. Retrieved from https://www.researchconnections.org/childcare/datamethods/descriptivestats.jsp

The Regents of the University of Wisconsin. (2016). SPSS for the classroom: the basics. Retrieved from https://www.ssc.wisc.edu/sscc/pubs/spss/classintro/spss_students1.html

Turner, K., & McCarthy, V. L. (2017). Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015. *Nurse Education in Practice, 22,* 21-29. https://doi-org.prxy4.ursus.maine.edu/10.1016/j.nepr.2016.11.002

APPENDICES

# APPENDIX A

# mind garden

**www.mindgarden.com**

To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

**Maslach Burnout Inventory forms: Human Services Survey, Human Services Survey for Medical Personnel, Educators Survey, General Survey, or General Survey for Students.**

The three sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument form may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

**Citation of the instrument must include the applicable copyright statement listed below. Sample Items:**

**MBI - Human Services Survey - MBI-HSS:**
> I feel emotionally drained from my work.
> I have accomplished many worthwhile things in this job.
> I don't really care what happens to some recipients.

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**MBI - Human Services Survey for Medical Personnel - MBI-HSS (MP):**
> I feel emotionally drained from my work.
> I have accomplished many worthwhile things in this job.
> I don't really care what happens to some patients.

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**MBI - Educators Survey - MBI-ES:**
> I feel emotionally drained from my work.
> I have accomplished many worthwhile things in this job.
> I don't really care what happens to some students.

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**MBI - General Survey - MBI-GS:**

I feel emotionally drained from my work.
In my opinion, I am good at my job.
I doubt the significance of my work.

**MBI - General Survey for Students - MBI-GS (S):**

I feel emotionally drained by my studies.
In my opinion, I am a good student.
I doubt the significance of my studies.

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

## PERCEIVED STRESS SCALE

**The questions in this scale ask you about your feelings and thoughts** during the last month. **In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.**

Name _____ Date _____

Age _____ Gender (*Circle*): M F Other _____

0 = Never   1 = Almost Never   2 = Sometimes   3 = Fairly Often   4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?   0  1  2  3  4

2. In the last month, how often have you felt that you were unable to control the important things in your life?   0  1  2  3  4

3. In the last month, how often have you felt nervous and "stressed"?   0  1  2  3  4

4. In the last month, how often have you felt confident about your ability to handle your personal problems?   0  1  2  3  4

5. In the last month, how often have you felt that things were going your way?   0  1  2  3  4

6. In the last month, how often have you found that you could not cope with all the things that you had to do?   0  1  2  3  4

7. In the last month, how often have you been able to control irritations in your life?   0  1  2  3  4

8. In the last month, how often have you felt that you were on top of things?   0  1  2  3  4

9. In the last month, how often have you been angered because of things that were outside of your control?   0  1  2  3  4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?   0  1  2  3  4

**mind garden**
info@mindgarden.com
www.mindgarden.com

References
The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 386-396.
Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health.* Newbury Park, CA: Sage, 1988.

APPLICATION COVER PAGE
- *KEEP THIS PAGE AS ONE PAGE – DO NOT CHANGE MARGINS/FONTS!!!!!!!!!*
- *PLEASE SUBMIT THIS PAGE AS WORD DOCUMENT*

## APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 400 Corbett Hall

(Type inside gray areas)
PRINCIPAL INVESTIGATOR: Samantha King     EMAIL: Samantha.king2@maine.edu
CO-INVESTIGATOR:   Patricia Poirier     EMAIL: Patricia.poirier@maine.edu
CO-INVESTIGATOR:     EMAIL:
FACULTY SPONSOR:   Patricia Poirier     EMAIL: Patricia.Poirier@maine.edu
(Required if PI is a student):
TITLE OF PROJECT:   Examining the Level of Stress Experienced by Undergraduate Nursing Students
START DATE:   March 8 2019    PI DEPARTMENT:   Nursing

STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE   U (F,S,G,U)

If PI is a student, is this research to be performed:

☒ for an honors thesis/senior thesis/capstone?     ☐ for a master's thesis?
☐ for a doctoral dissertation?     ☐ for a course project?
☐ other (specify)

Submitting the application indicates the principal investigator's agreement to abide by the responsibilities outlined in Section I.E. of the Policies and Procedures for the Protection of Human Subjects.

Faculty Sponsors are responsible for oversight of research conducted by their students. The Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research. REMINDER: if the principal investigator is an undergraduate student, the Faculty Sponsor MUST submit the application to the IRB.

## Email this cover page and complete application to UMRIC@maine.edu

*******************************************************************************************************
FOR IRB USE ONLY    Application # 2019-02-19     Review (F/E): E Expedited Category:
ACTION TAKEN:

☒ Judged Exempt; category 2 Modifications required? Yes Accepted (date) 3/8/2019
☐ Approved as submitted. Date of next review: by    Degree of Risk:
☐ Approved pending modifications. Date of next review: by    Degree of Risk:
    Modifications accepted (date):
☐ Not approved (see attached statement)
☐ Judged not research with human subjects

FINAL APPROVAL TO BEGIN     3/8/2019
                     Date

10/2018

Consent to Participate in Research Study

You are invited to participate in a research project being conducted by Samantha King, an undergraduate student in the Department of Nursing at the University of Maine. Her faculty sponsor is Patricia Poirier a professor in the Department of Nursing. The purpose of the research study is to determine if the stress in sophomore nursing students differs from senior nursing students in the same nursing program. The study also will ask you about measures you may use to reduce your stress.

**What Will You Be Asked to Do?**

If you decide to participate, you will be asked to complete two paper surveys. It should take you about 15 minutes to complete the surveys.

**Risks:**

There is the possibility that you may become uncomfortable answering the questions. You may skip any questions that make you uncomfortable.

**Benefits**

While this study will have no direct benefit to you, this research may help us learn more about stress in undergraduate nursing students and may help faculty find ways to reduce stress while in schools.

**Confidentiality**

This study is anonymous. Please do not write your name on the surveys. There will be no records linking you to the data. Data will be kept on a password-protected computer indefinitely. The paper surveys will be destroyed once the data has been entered onto the computer, no later than August 30, 2019.

**Voluntary**

Participation is voluntary. If you choose to take part in this study, you may stop at any time. You may skip any questions you do not wish to answer.

Submission of the survey implies consent to participate.

**Contact Information**

If you have any questions about this study, please contact me at Samantha.king2@maine.edu You may also reach the faculty advisor on this study at patricia.poirier@maine.edu If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine, 207/581-2657 (or e-mail umric@maine.edu).

## Appendix C

### Script to Students Explaining Study and Data Collection

I am conducting a study to research stress in undergraduate nursing students at the University of Maine as part of my honors' thesis. I am asking each of you to complete two surveys that I will provide via paper handout at the end of class. The first survey will ask how you feel about your academic work. The second survey will assess your individual stress level. It will take approximately 10-15 minutes to complete the surveys. You may skip any question that you prefer not to answer. In addition, please know that you may refuse to participate in this study without penalty.

Please do not put your names on the surveys. Just let me know what course you are in (NUR 200 or NUR 456). Please place the completed surveys in the box at the front of the room. All information will be kept anonymous and will be entered into a secured computer database, while paper surveys will be stored in a secure file at the University of Maine. The paper surveys will be destroyed once the data has been entered into the computer, no later than August 30, 2019. The secured data will be kept indefinitely.

More information is in the informed consent at the beginning of the surveys. If you have any questions, please feel free to let me know. Your contribution to this research is greatly appreciated.

# AUTHORS BIOGRAPHY

Samantha King grew up in Waterville, Maine and moved to Fairfield, Maine in middle school. She graduated from Lawrence High School in the top 10 students of her graduating class in 2014. She began her freshman year of college at Kennebec Valley Community College before deciding to transfer to the University of Maine the spring semester of her freshman year. She decided to pursue nursing as a career, because she had a passion for anatomy and physiology in high school, and she is driven to help others. The nursing program at the University of Maine represented her inspirations, and she knew she made the right decision to transfer as she began to excel academically and grow personally. Samantha has been motivated to maintain high honors throughout her time at this university. She has spent her time fully engaged to her studies and inspired to become a professional nurse in the future. She is a member of Sigma Theta Tau International Honors Society of Nursing. She has accepted a position at Maine General Medical Center in Augusta, Maine where she will be a new graduate nurse in the SHINE Medical-Surgical Residency Program. She intends to have her research benefit the undergraduate nursing students at the University of Maine, and is hopeful that interventions can be implemented to better suit these students in the near future and beyond. She is eager to begin her new journey after graduation, but eventually would like to build on her research through a Master's program while seeking her Nurse Practitioner (NP) degree.