

The Seventeenth Annual  
*Ranger Research Day*

Friday, November 18, 2022  
Student Center Ballroom



**LIST OF  
ABSTRACTS**

The Seventeenth Annual  
**Ranger Research Day**

Northwestern Oklahoma State University  
 Alva, Oklahoma ~ Friday, November 18, 2022  
 Student Center Ballroom

# ABSTRACTS

## *Education*

### *3.06 Psychology*

#### **3.06.01, “Physiological Impact of Music on Mood” [Poster]**

##### **Grace Hise (Prof. Taylor Randolph, Sponsor)**

Music is powerful. It makes people feel a variety of emotions (Cook et al., 2019; Garrido & Schubert, 2015). As shown in Chafin and others’ (2004) research, it can also help in reducing high blood pressure after a stressful event. The power of music is important. If it could be used to induce positive moods, and to improve blood pressure (BP), pulse, and respirations, and overall mood, that would be beneficial to many. The independent variables were the different genres of music that participants were asked to listen to. These included indie/pop music, rock/alternative music, and instrumental/classical music. The dependent variables were the vitals that were measured (BP, pulse, and respirations). The researcher measured a second dependent variable, a subjective measure where participants were asked to use a modified version of the Wong-Baker FACES scale in order to rate their mood (Garra et al., 2010). This was done in hopes that the subjective response would help support that mood and physiological measures are impacted in a related way.

#### **3.06.02, “Social Media Consumption and its Relationship to Post-Partum Depression” [Poster]**

##### **Frances Leaming (Prof. Taylor Randolph, Sponsor)**

The purpose of this study is to explore a possible connection between social media consumption (SMC) and post-partum depression (PPD). The researcher will look into how much social media is consumed and if this has an effect or influence on postpartum depression and if the relationship between the two has a negative or positive outcome. Previous literature shows a contradiction between the relationship siding with both positive and negative outcomes. So, the researcher questioned whether or not her research will favor one side or the other. The independent variable is the Social Media Consumption Scale (SMCS) modified (Sidani et al, 2020) and the dependent variable is going to be the Edinburgh Post Natal Depression Scale (EPDS) modified (Cox et al. 1987). The researcher

hypothesizes that mothers who consume social media extensively will have a higher chance of having post-partum depression.

### **3.06.03, “Traditional and Nontraditional College Students: Do Older College Students Have a Higher GPA Than Younger College Students?”**

[Poster]

#### **Shawnace Melendez (Prof. Taylor Randolph, Sponsor)**

College campuses are receiving a higher number of older students than ever before, increasing the need for research on the ever-changing learning environment. Traditional students (TS) are students 24 years of age and younger. Nontraditional students (NTS) are 25 years of age and older. Grade point average (GPA) is a standard method of measurement within universities to dictate the overall success of a student. The researcher posed the question, does age play a role in success rates of college students? The researcher used GPA and age as a dependent variable; independent variables were nontraditional and traditional NWSU students. Stress was measured as a control to determine if a relationship exists between GPA in students and perceived stressors. The researcher hypothesized a correlation between age and GPA; when the student's age increases so does GPA.

### **3.06.04, “Relationship between Mental Toughness, Positive Thinking, and Symptoms of Depression”** [Poster]

#### **Clare Merrigan (Prof. Taylor Randolph, Sponsor)**

This study aims to explore the effect that mental toughness has on one's outlook on life and overall happiness. Mental toughness can be described as the ability to overcome and handle mental challenges and stressors. Having a positive outlook on life allows one to find joy and see the positive in certain situations while others may not be able to. Mental toughness and positive thinking could be used to counter common symptoms of depression. Trying to live with these two ideas in mind may aid individuals in battling depression. Possible findings from this study could lead to practical and medical use focused on increasing mental toughness to increase overall life enjoyment.

Inspiration for this study comes from Finnish culture. Finland is ranked the happiest country in the world (Goshwami et al., 2022). Their cultural ideals could be used to increase America's happiness index. One of their cultural ideals comes from the Finnish word Sisu. Sisu is the backbone of Finnish culture (Goshwami et al., 2022). It can be roughly translated in English as strength of will, determination, and acting in the face of adversity (Finlandia University, 2019). These are all terms that can be used to describe mental toughness.

This study will use three different psychology scales to explore the correlation between mental toughness, thought processing mechanics, and depression symptoms. The instruments that will be used are the Mental Toughness Questionnaire IO (Papageorgiou, 2010), Beck Depression Inventory (Beck, et al, 1996), and The Positive Thinking Scale (Pearle, 1950).

### **3.06.05, “Effectiveness of Physical Activity on Mental Health” [Poster] Wendy Aguilar (Dr. Jason Ferrell, Sponsor)**

The purpose of the current study is to examine the relationship between physical activity and mental health. The literature reveals mostly positive outcomes when looking at physical activity’s relationship with mental health; however, much of the literature focuses on retroactive memory of physical activity and less on doing physical activity. The current study’s participants who take part in physical activity, which includes any type of physical activity. The researchers will distribute the survey to a small midwestern university and a social media platform, Facebook. The participants will complete before and after measures of the Physical Activity and Sedentary Behavior Questionnaire (PASB-Q) and the Beck’s Depression Inventory 2. We hypothesize that physical activity will increase positive perceptions of physical activity outcomes as well as decrease state levels of depressive symptoms.

### **3.06.06, “Understanding Retention and Persistence of Students in Higher Education” [Poster]**

#### **Amber Andrews (Dr. Jason Ferrell, Sponsor)**

Student retention and student persistence are important outcomes in the higher education world. Low student retention rates can negatively affect students and institutions. There are many factors that may have an effect on student retention and persistence including faculty support, academic ability, cognitive skills, finances, and community involvement. Retention rates may be of concern with any type of students; however, programs designed specifically for first generation students and students with disabilities are more common because retention rates in these populations are more drastic. The purpose of the current study is to examine student retention at a community college. Researchers will gather archival data that students who dropped out submitted to the college. Qualitative and quantitative analyses will be conducted on the archival data to better understand that factors that underlie dropping out of college.

### **3.06.07, “ADHD and Nicotine Use: Vaping Devices and Cigarettes” [Poster]**

#### **Malliyah Baker (Prof. Taylor Randolph, Sponsor)**

The researcher examined the relationship between nicotine use disorder within individuals who have a history of ADHD (Attention Deficit-Hyperactivity Disorder). The participants for this study were obtained using a snowball sampling method through the researcher’s access to a private Facebook support group for adult individuals with ADHD. Changes to a modified version of the FTQ, Fagerstrom Tolerance Questionnaire, were made to represent criteria for nicotine use patterns through the use of vaping devices, in addition to the original method of use cigarettes (Fagerstrom et al., 1991). Scores of this instrument adhere to ADHD diagnosis by indicating how the disorder manifests through the four behavioral components listed within the study (inattention, hyperactivity, impulsivity, and conduct disorder), and significantly predict the mirroring of known risk factors for substance use disorders, more specifically nicotine use disorder (Fuemmeler et al., 2007). The researcher hypothesized that the experience of high nicotine use is commonly linked to individuals with a prevalence of ADHD due to the comorbidity of characteristics. Results from the study revealed a non-significant relationship between the FTQ and ADHD symptoms ( $r = .003$ ,  $p$

= .986), nor relationships between age and the FTQ and ADHD symptoms. However, the researcher did find a significant relationship between first diagnosis or onset of symptoms and age of the participant, indicating that most participants who were experiencing ADHD symptoms had also been diagnosed or experienced ADHD within the past year ( $r = .710, p < .001$ ).

### **3.06.08, “The Dark Triad of Personality Traits and Educational Attainment” [Poster]**

#### **Louis Miele (Prof. Taylor Randolph, Sponsor)**

The topic of this research is over the dark triad and how it affects college students and their success in college. How do the three traits that make up the dark triad affect the performance of college students and how successful are they? In the business world people who score high in two of the three, specifically narcissism and Machiavellianism, are successful in a business setting most often found in positions of power trying to climb the corporate ladder. The purpose of this topic is to see if the same applies to the college world, if people are also further along in the college world with higher scores on the dark triad test just like how it is in the business setting or if it makes them less successful in college. There is also the factor of the college athlete who may make use of the third trait, psychopathy, to advance their sports prowess to maintain their place in the college as a student. The hypothesis is that the students who are further along in the process of graduating will test higher on the scale. The independent variable would be the students themselves and the dependent variable would be the surveys that will measure the data from the students.

### **3.06.09, “Adverse Childhood Experiences in College Completion”**

[Poster]

#### **Dayra Verduzco-Serrano (Prof. Taylor Randolph, Sponsor)**

Research on Adverse Childhood Experiences has illuminated health concerns attached to children who were faced with difficulties during their development. The study aims to discover if the level of severity in ACEs delays a student’s college degree completion date. Calamity encounters are but are not limited to abuse, neglect, and house dysfunction. Explored data has identified ACE leading factors that may disrupt regular routine in college students mentioned in detail within the reading. The participants of Northwestern Oklahoma State University students were questioned about their exposure to ACEs and their demographic background ( $n = 43$ ). Information concerning the researcher’s study was sent through the Student Services email. A correlation analysis explored the relationship between the levels of ACEs with surveyors' academic and demographic information in mind. In correspondence, results did not show significant results ( $r_{ho} = .218, p < .160$ ). The participants were mainly women and freshmen students. Given that the survey did not ask further questions to provide the exact length of time and academic performance, it could have impeded the results. Further research is possible with the use of the limitations the author provides and more.

### 3.06.10, “Personality and Social Media” [Poster]

#### **Ernesto Ochoa (Prof. Taylor Randolph, Sponsor)**

Since the creation of smartphones, the rise of Social Networking Sites (SNS) has granted its users to communicate in a virtual context, substantially substituting face-to-face interaction. The researcher is interested in whether there is a correlation between increased levels of narcissism with increased usage of SNS. Narcissism can be generally characterized by someone who excessively admires themselves and appearance but also consistently seeks admiration and lacks empathy for others (Brailovskaia et al., 1970). Several empirical studies and meta-analyses of self-reports regarding SNS usage increasing narcissism found minimal to moderate relationships, and in few cases, strong relationships, although journalists and publication entities tend to be biased and are supportive of data that is more fitting to their subjective narratives, which spreads misinformation.

The researcher intends to conduct a correlational study to further expand on existing research exploring a relationship between SNS usage, and narcissism. Participants for this study will be gathered online from Facebook, Instagram, and NWOSU via email where predictive variables such as one’s levels of narcissism: low, medium, high, and SNS usage will be assessed with the implementation of the German-Narcissistic Personality Inventory-13 (G-NPI-13) and include an item for SNS usage to determine the average amount of time spent on social media.

## ***Math & Science***

### *6.02 Chemistry*

#### **6.02.01, “Study of Iodine Distribution and Concentrations in Western Oklahoma Brine Waters and Recycling of Used Chloroform” [Poster]**

#### **Josena Frame (Dr. Jason Wickham, Sponsor)**

In the late 1970s, it was discovered that the brine waters of NW OK contain significant amounts of Iodine (above 60 ppm). However, the exact amounts and distributions of Iodine throughout this region were unknown. Currently, the majority of the world's supply of Iodine comes from mining Iodate minerals in Chile ( $\approx 65\%$ ), brine water aquifers in NW Oklahoma ( $\approx 5\%$ ) and Japan ( $\approx 25\%$ ), and seaweed extraction. With the growing need for Iodine compounds in various fields the demand for Iodine is higher than ever. Thus, Iofina has recruited the aid of NWOSU to quantify the Iodine concentrations and distribution throughout the brine aquifer as well as to determine the longevity of these iodine concentrations. So far, this study has led to the discovery of new sites within the aquifer that may be of commercial interest and has taken an in-depth look at several possible new plant sites, with one of these sites being built and beginning operation during April 2020.

Fluctuations in iodine concentrations of up to 100 ppm have been observed throughout this study, which is a much larger fluctuation than the expected 10 ppm. We are currently investigating whether these fluctuations are due to the changed from vertical to horizontal wells as a function of the inhomogeneity within the brine aquifer. Iofina currently uses chloroform during routing testing procedures during plant operations. In order to reduce the financial and environmental impact of this chloroform waste we have generated a distillation process to recycle this chloroform. Currently, this procedure has yielded a 93% to 95% recovery and has tested identical to that of newly purchased chloroform.

## 6.06 Nursing

### 6.06.01, “The Correlation Between Decreased Quality of Sleep and Anxiety in Nursing Students” [Poster]

**Bailey Bragg, Jamaica Grace, & Emalee Williams  
(Dr. Leslie Collins, Sponsor)**

Academic burnout in student nurses is prevalent around the globe, regardless of educational level. From licensed practical nursing to nurse practitioners, nursing school is both physically and mentally demanding of an individual. The demands associated with nursing school poses multiple, detrimental psychological deficits that ultimately affects the academic capability of students. Throughout our research, identifying maladaptive coping behaviors in nursing students has posed a number of questions that correlate directly to poor sleep quality, anxiety, and academic burnout in nursing students. Our research sought out to analyze the relationship between decreased quality of sleep and the ultimate result of anxiety associated with nursing school. After examining a multitude of articles, we were able to formulate a conclusion based upon the numerous works of others. Poor sleep quality, anxiety, and the psychological and physical demand that is asked of nursing students puts this specific population at an increased risk of academic burnout before beginning their careers. Our research analysis illustrated a strong and growing correlation between decreased quality of sleep, the result of anxiety, and suffrage of academic burnout as a result.

### 6.06.02, “Effectiveness of Vaccines on HPV Infections and Cervical Cancer Prevention” [Poster]

**Mary Kay Henderson, Casey Sims, & Shelby Smith  
(Dr. Leslie Collins, Sponsor)**

In the United States, Human Papillomavirus (HPV) is the most common sexually transmitted infection. HPV is a precursor to cervical cancer, which has a high mortality rate. Over 80 million individuals are currently infected and nearly 14 million people are diagnosed each year. Highly efficient vaccines for HPV are available and research shows the vaccine significantly reduces the likelihood of developing an HPV-related infection, including cervical cancer. Completion of the vaccination dose series remains low for young women. This is a result of insufficient education, lack of availability, and inadequate communication between providers and patients. HPV and cervical cancer continue to be subjects deemed taboo for discussion within the public. A 10-article literature review validates the results and recommendations for the vaccine as well as appropriate education to those eligible for the vaccine series and their parents or guardians.

### 6.06.03, “Emergency Department Overuse” [Poster]

**Abigail Miller & Kaylee Heisler (Dr. Leslie Collins, Sponsor)**

Does the lack of primary care providers in Oklahoma have an effect on the overcrowding in emergency rooms? The number of ER visits has increased in the last two years by 30%. Non-urgent patients seeking care in the emergency room reduces the quality of care. In Oklahoma, there is only one primary care provider per 713 citizens. Overcrowding can create longer wait times which leads to the increasing risk for poor health outcomes. These outcomes can be resolved by educating the community about urgent vs. nonurgent issues. Research suggests that primary care offices would benefit from extending their hours to be

more available and also coordinate with the hospitals on follow-ups after being seen in the ER. Giving Oklahomans more access to primary care providers for non-urgent conditions would help decrease the overuse of emergency rooms.

#### **6.06.04, “Influencing Risk Factors for Women’s Cardiovascular Health”**

[Poster]

**Kelsey Petty, Lauren Veach, & Jacylin Longhofer**

**(Dr. Leslie Collins, Sponsor)**

Cardiovascular disease is the leading cause of death for women in the United States. Several physical and biological factors have been identified as influencing factors on women’s cardiovascular health. The literature review identified some common behaviors and lifestyles frequently practiced among women. Review of the literature has identified that the fetal demand of pregnancy greatly changes volume circulated in the cardiovascular system by up to 50%. Lasting hormonal changes experienced by women can be attributed to greater prevalence of heart disease and stroke. Research suggested, the number of pregnancies a woman experiences also displayed a greater risk of the patient developing congestive heart failure later in the woman’s life. Another factor explored throughout the research was the patterns of physical activity. Research found that physical activity played a significant role in primary preventative measures of cardiovascular disease. The literature also revealed periods of inadequate sleep, and fatty diets significantly influenced risk and prevalence of cardiac disease.

#### **6.06.05, “Readmission Rates and Length of Hospital Stay” [Poster]**

**Kailin Lian & Ally Riley (Dr. Leslie Collins, Sponsor)**

Length of stay and readmission rates are common statistics used to determine patients’ outcomes and hospital performance. These are important to the healthcare field in order to continue striving towards improved quality care and patient satisfaction. Both length of stay and readmission rates are seen as a preventable failure in the hospital setting and are needed to be continually challenged and tested. This project set forth to answer the question of: In hospitalized patients above the age of 18, what is the effect of a long length of stay on readmission rates compared with a short length of stay within 4 days. For the purpose of this research project, length of hospital stay is defined as the amount of days the patient stayed in the hospital. Readmission rate is defined as the rate of patients being readmitted after staying in the hospital for an x amount of time. A short length of stay is defined as a stay in the hospital shorter than 4 days. A long length of stay is defined as a stay in the hospital exceeding 4 days. Research states that there is no correlation between readmission rates and length of hospital stay. There are many factors to consider in determining an average length of stay in the hospital including but not excluded to: acute/chronic primary health condition, age, pre-existing conditions, allergies, gender, and religious preference. This research project found no relationship between length of hospital stay and readmission rates.



#### **6.06.06, “Incidence of Mental Illness in Chronic Disease” [Poster]**

**Anisha Bhakta, Allison Brooke Huffmaster, & Clare Merrigan**

**(Dr. Leslie Collins, Sponsor)**

Research shows that there is an increase in mental health conditions for those who have been diagnosed with chronic illness. Research stated that 51.8% of adults suffer from one or more chronic illnesses. Currently there is little to no standardized screening or treatment for mental conditions with those who experience chronic illness. Gathering supportive evidence that mental health conditions are prevalent can help instill preventative measures in chronic illness patients and identify complications early. This can have positive effects in multiple aspects of patient care such as patient outcome, patient satisfaction, length of stay, and medical costs. Results show consistent data that there is an increase in mental health conditions with those who struggle with chronic illness. Research states that 50.4% of patients had anxiety and 42.6% of patients having depression with thyroid disorder. An Australian nation-wide study with 8,841 participants found that people diagnosed with chronic illness(es) were associated with higher evidence of mental illness. A person's activities of daily living can be challenging when they need to take care of their illness(es) in addition to their daily activities. Studies support proactive screening and treatment plans brought into the care plans of those diagnosed with chronic illness to decrease mental health complications.

#### **6.06.07, “Night Shift Effects on Patient Safety” [Poster]**

**Kayla Kelley & Ashlynn Moutaw (Dr. Leslie Collins, Sponsor)**

The purpose of this evidence-based project is to highlight the correlation between patient safety and the negative effects of shift work, considering the fatigue and cognitive impairment related with circadian rhythm disruption. Using research with emphasis on night shift and cognitive function, a literature review shows a significant amount of consistent data to gather information and draw a conclusion. Results are consistent with many night shift nurses having experienced issues with patient safety. Comparing day and night shift, those on the night shift schedule had significantly lower scores than those on the day schedule. One study tested the cognitive function of night shift nurses and found that at the 10-hour mark of a nurse's shift on nights, they had the cognitive performance of that of someone with the blood alcohol level of 0.08%. An additional study tested the cognition of sleep deprived day shift nurses, and the night shift nurses were still considered more cognitively impaired. In conclusion, the results show a parallel between shiftwork and impairments in cognitive performance such as reduced concentration, impaired motor skills, and poor memory. Further research is recommended to evaluate the effectiveness of naps during night shift and decreasing the amount of quick returns to reduce patient safety issues.

#### **6.06.08, “Nurse Staffing” [Poster]**

**Ashley Steadman & Kailee Holmes (Dr. Leslie Collins, Sponsor)**

Nursing in the hospital is not an easy task. Nurses are asked to care for critically-ill patients in several ways. Most of the time hospital floors are staffed based on the census of the floor. This could be detrimental to both the nurse and the patients. Staffing nurses by patient acuity is important because it can improve the care given to patients who are in need of critical, one-on-one care. It will also improve patient, family, and nurse satisfaction. Additionally, staffing based on acuity can help reduce the stress and “burnout” put on nurses

in the hospital setting. This project will show that research suggests that the outcomes of nurses and patients are lower when staffed by census, than if they were staffed by patient acuity.

#### **6.06.09, “Reducing the Risks of Foley Catheter Associated Urinary Tract Infections” [Poster]**

**McKayla Monday & Brenner Clark (Dr. Leslie Collins, Sponsor)**

Foley catheter insertion for patients is a nursing practice used especially in the critical care setting, such as ICUs or Emergency rooms. With the use of Foley catheters, there seems to be an increase in the number of catheter-associated urinary tract infections (CAUTIs) seen in any hospital. The purpose for this evidence-based research project was to determine if in hospitalized patients, does Foley catheter use increase the risk of urinary tract infections in elderly patients. Results from research showed that 4.4% of patients that had Foley catheters were diagnosed with a UTI after insertion. A key finding in decreasing CAUTIs in the elderly were the infection control techniques used to prevent bacteria from being introduced into the urinary tract of the patient. PubMed and CINAHL were the databases used to find this information. The literature review was completed using keywords such as CAUTI, UTI, Foley catheter, and prevention. The findings of this evidence-based research project were that CAUTI risk was increased in the elderly population; however, prevention techniques such as prescreening, prophylactic antibiotics, nurse education, and CAUTI prevention bundles were found to decrease the risk by 80%.