

The Twentieth Annual  
**Ranger Research Day**

Friday, November 21, 2025  
Student Center Ballroom,  
Alva Campus

**NWOSU**

**LIST OF  
ABSTRACTS**

The Twentieth Annual  
**Ranger Research Day**

Northwestern Oklahoma State University  
 Alva, Oklahoma ~ Friday, November 21, 2025  
 Student Center Ballroom

## A B S T R A C T S

### *Education*

#### *3.06 Psychology*

##### **3.06.01, “Managing Midnight Miles: A Qualitative Descriptive Single-Case Study on Sleep Strategies Among United States Ultra-Marathon Runners” [Poster]**

##### **Dr. Bailey Lancaster, Faculty**

Sleep plays a vital role in athletic performance, yet ultra-marathon runners often face inadequate sleep due to the intense demands of their sport. The negative effects of insufficient sleep on the physical health, psychological health, and social well-being of ultra-marathon athletes are considerable; however, tailored sleep interventions for this group are still not well understood. This qualitative descriptive single-case study explored how ultra-marathon runners in the United States perceive the role of sleep in relation to their physical health, psychological health, and social factors during endurance events. Guided by the biopsychosocial model, the study explored sleep management from biological, psychological, and social perspectives. A purposive sample of 15 ultra-marathon runners from across the United States participated in semi-structured virtual interviews. Data analysis followed Braun and Clarke’s reflexive thematic analysis framework, resulting in nine major themes. Key themes included strategic sleep optimization, bidirectional sleep negotiation, psychological adaptation, identity and community belonging, and sleep disruption consequences. Athletes described using intentional sleep practices, such as sleep tracking technology, behavioral sleep hygiene, and recovery strategies, aimed at enhancing performance, while acknowledging the challenges posed by external factors, including work and family responsibilities. The findings highlighted significant psychological disruptions caused by sleep deprivation, including emotional instability, motivational issues, and cognitive impairments during critical race moments. Recommendations suggest targeted interventions that combine technology, behavioral approaches, and social support. Future research should explore larger, more diverse samples and assess the effectiveness of specific sleep interventions. These findings offer valuable guidance for improving sleep in ultra-endurance sports, benefiting athletes, coaches, and sports health professionals.

### **3.06.02, “Family Systems’ Effects on Self-Motivation and Ideals” [Poster]** **Macy Eads (Dr. Taylor Randolph, Sponsor)**

This study researches the correlation between family type/structure, motivation, and academic achievement, using a correlational quantitative design, surveying at least 30 undergraduate NWOSU college students aged 17 to 27 without bias of race, gender, ethnicity, or major. The survey has 37 questions involving motivation, family style, and student characteristics. The researcher collects data over the relationships between the variables with the intent to find ways to improve motivation and overall academic achievement. Participants have given informed consent and taken the Academic Achievement survey (2006). The researcher then began to find these correlations, comparing them with past research through SPSS statistical data collection.

### **3.06.03, “The Impact of Family Preservation Services on Reunification Rates Within the Child Welfare System” [Poster]** **Cally Winburn (Dr. Taylor Randolph, Sponsor)**

This quantitative study aims to investigate the impact of family preservation services on reunification rates within the child welfare system. While child welfare systems are fundamentally committed to promoting family preservation and reunification, the complexities inherent in ensuring child safety and well-being can lead to challenging circumstances, including periods of out-of-home placement. These situations may present significant hurdles to successful family reunification efforts and potentially impact children's developmental trajectories. This research seeks to determine whether formalized family preservation services (e.g., Community-Based Human Services and Youth Villages Oklahoma programs) are associated with higher family reunification rates and reduced recurrent out-of-home placements compared to interventions primarily involving out-of-home placement or no formalized preservation services. The study will analyze publicly available outcome data from key family preservation programs, specifically comparing reunification rates in Oklahoma before and after the implementation of the CHBS and Safecare programs. This research is significant as it endeavors to provide evidence-based support for policies and practices that prioritize family preservation, ultimately contributing to improved outcomes for children and families involved with the child welfare system.

### **3.06.04, “The Impact of Video Gaming on Sleep Quality and Academic Performance Among First-Year College Students” [Poster]** **Haylee Sellers (Dr. Taylor Randolph, Sponsor)**

This study examined the impact of gaming habits on academic performance (GPA) and sleep quality of first-year college students compared to all students. Specifically, it compared students who gamed 1–2 hours a day with those who gamed more than four hours a day. With increasing concerns about the effects of excessive screen time, particularly gaming, on students' overall well-being, this research aimed to determine whether a higher frequency of gaming correlated with lower academic achievement and disrupted sleep schedules. Data was collected through a survey administered to all college students, assessing their average daily gaming time, GPA, and self-reported sleep duration and quality. Preliminary findings suggested that students who engaged in gaming for more than four hours a day reported lower GPA scores and more irregular sleep patterns compared to those who gamed for 1–2 hours a day. The results highlighted the potential negative effects of excessive gaming on

academic success and sleep duration. This study emphasized the importance of managing recreational screen time to support better academic performance and healthier sleep habits among college students. The results for this study found that there were no significant differences in the quantity of sleep or quality of sleep between Freshman and Senior participants. However, a significant negative relationship was found between sleep quality and GPA.

### **3.06.05, “Motivation of Collegiate Athletes vs Former Athletes” [Poster] Hunter Eads (Dr. Taylor Randolph, Sponsor)**

Sports are a marvel when considering that humans are some of the only animals to participate in them with an example outside of humans being rats, who wrestle with one another (S. M. Himmler, et al, 2016), which asks questions about what would motivate them to engage in this type of play. Previous studies tackle the questions about why sports have high dropout rates while still leaving many qualitative questions unanswered (Crane and Temple, 2015; Fraser-Thomas, et al, 2018; Møllerlækken et al, 2015). The researchers used the Sports Motivation Scale (SMS) (Pelletier, et al, 1995). The literature surrounding the topic largely focuses on players as they are participating in sports and lack some understanding of former athletes and the types of motivation either unique to sports or otherwise represented in sports. It consists of 7 subscales, of which there are three for Intrinsic Motivation (IM to Know, IM to Accomplish, and IM to Experience Things), three for Extrinsic Motivation (External Regulation, Introjected Regulation, and Identified Regulation), and Amotivation (Deci & Ryan, 2008). The view proposed by the researcher is that there is a relationship between motivation and continuation in college sports among undergraduate populations. In the experiment the researcher was not able to find statistical significance that those who are still in sports or who have stayed in sports the longest are most correlated with Extrinsic Motivation (higher in External Regulation, Interjected Regulation, and Identified Regulation).

### **3.06.06, “Interpersonal Relationship Quality Influencing Well-Being” [Poster]**

#### **Paige Bailey (Dr. Taylor Randolph, Sponsor)**

Relationships among individuals directly affect well-being (Thomas et al., 2017). Past findings are examined and aligned with the present study. There is countless research on social relationships and mental health in college students, displaying that young adults face mental distresses that can be explained by social interactions. The current study focuses on the research gap of how quality in interpersonal relationships influences well-being in young adults, by focusing on romantic partners, close friends, and parental figures. The quality of one's relationships notably projects well-being measures, including satisfaction with life, stress, and depression (Pieh et al., 2021). The quality of characteristics, including support and tension, shape emotional well-being (Thomas et al., 2017). The current study utilized a correlational, cross-sectional design method and applied an online survey relying on self-reporting measures. Participants were assessed using a combination of psychological scales, including the modified interpersonal relationship scale (MIRS), the patient health questionnaire (PHQ-9), and the GAD7 anxiety scale. The results of the study show that a

higher score of relationship quality, indicating a negative relationship, predicted higher scores of depression and anxiety, and answers the question: How is relationship quality related to scores of anxiety and depression among young adults?

### **3.06.07, “Rest to Invest” [Poster]**

#### **Kamryn Laymon (Dr. Taylor Randolph, Sponsor)**

This study examined the relationship between parental sleep quality and parent/child interaction to determine whether sleep deprivation negatively influences parental engagement and responsiveness. Forty parents over the age of 18 who were actively responsible for child rearing at least four days a week participated in an online correlational survey distributed through university email and social media recruitment. Participants completed a 20-question survey developed from validated sleep and parenting scales to assess sleep quality, parenting satisfaction, and child engagement. Statistics, Pearson's correlation, and t-tests were used to analyze the data. Although it was hypothesized that parents who reported lower sleep quality would demonstrate reduced positive engagement and higher levels of negative interaction, the results did not support this assumption. Analysis revealed little to no correlation between parental sleep quality and parent–child interaction quality. These findings suggest that, within this sample, sleep quality may not be a strong predictor of parenting engagement. Further research with larger, more diverse samples is recommended to clarify the potential influence of sleep on parental functioning and child development.

### **3.06.08, “Exploring the Relationship Between Social Media Use and Body Comparison Behaviors: Implications for Self-Image and Mental Health” [Poster]**

#### **Reagan Hiner (Dr. Taylor Randolph, Sponsor)**

This study explores the relationship between social media use and body comparison behaviors, focusing on their implications for self-image and mental health. As social media platforms become integral to daily life, users often present curated versions of their appearances and lifestyles, fostering an environment conducive to social comparison. This exposure to idealized representations can negatively impact self-worth and body image. Grounded in social comparison theory, the research examines how individuals assess their body image in relation to others' curated portrayals, leading to feelings of inadequacy, particularly among women. The findings reveal that body comparison behaviors are prevalent and often unconscious, causing individuals to focus on specific physical traits, which exacerbate concerns about societal beauty standards. While social media fosters connection and community, it simultaneously poses risks to mental health by reinforcing harmful ideals. This study emphasizes the need for increased awareness of social media's effects on body image and advocates for strategies to encourage healthier online interactions. By understanding these dynamics, individuals can navigate social media more consciously, promoting improved self-image and mental well-being.

### **3.06.09, “How Classical Music Affects Stress” [Poster]**

#### **Jaydan Coffman, Samora Collins, & Elisabeth Ridgway (Dr. Taylor Randolph, Sponsor)**

The stress experienced by college students happens throughout our nation and plays a vital role in college dropout rates. In this study, the relationship between classical music and stress will be analyzed among college students. A sample of NWOSU students will take a survey regarding their stress as students as well as their demographic (class level, gender, major,

etc.). They will also be prompted in this survey to listen to a classical music piece for a portion of time and then evaluate themselves on a scale. Stress levels will be measured using a self-reported scale created by the researchers. The findings will consist of classical music lowering the immediate stress levels among the participants.

### **3.06.10, “Holistic Medicine as a Treatment for Substance Abuse” [Poster] Halie Shirley (Dr. Taylor Randolph, Sponsor)**

Substance abuse remained a significant public health concern, with conventional treatment approaches primarily emphasizing pharmacological and behavioral interventions. Previous research suggested that holistic medicine, including acupuncture, yoga, meditation, nutritional therapy, and herbal medicine could serve as a complementary approach in addressing substance use disorders (Junyue et al., 2021). This study employed a quantitative research design to examine the efficacy of holistic therapies in improving recovery outcomes among individuals with a history of substance use. Data were collected through a confidential online survey distributed via social media platforms to ensure voluntary participation, anonymity, and adherence to ethical research standards, including informed consent and confidentiality. Thirty participants completed the survey, which measured engagement in holistic practices, perceived well-being, and relapse history to identify potential correlations between holistic approaches and sustained recovery. Quantitative analyses of the physiological, psychological, and social dimensions of holistic interventions provided empirical evidence contributing to the growing body of literature on integrative treatment models. The findings were intended to enhance understanding of how holistic practices may support relapse prevention and promote long-term well-being among individuals recovering from substance use disorders.

### **3.06.11, “The Impact of Digital Notification Frequency on Decision Fatigue, Stress, and Cognitive Strain in the Workplace” [Poster] John Hofferber (Dr. Taylor Randolph & Prof. Taylor Phillips, Sponsors)**

Workplace digital notifications have become ubiquitous, yet their psychological impact on employee well-being remains poorly understood. This study examined whether notification frequency predicts digital workplace stress, perceived stress, and decision fatigue in 167 working adults. Participants were classified into Low (1-20 notifications/day,  $n=15$ ), Moderate (21-50/day,  $n=59$ ), or High ( $>50$ /day,  $n=79$ ) groups based on self-reported notification volume. One-way ANOVAs revealed significant differences across all outcome measures. High notification frequency was associated with substantially elevated digital workplace stress ( $\eta^2=.418$ ), perceived stress ( $\eta^2=.197$ ), and decision fatigue ( $\eta^2=.186$ ), with all group comparisons significant ( $ps<.05$ ). A clear dose-response relationship emerged: each increase in notification frequency corresponded to significantly higher stress and fatigue. Exploratory measures revealed novel mechanisms, including anticipatory stress experienced before viewing notification content ( $\eta^2=.413$ ) and prioritization difficulty ( $\eta^2=.367$ ). Notably, these three exploratory items showed extremely high intercorrelations ( $r=.839-.882$ ), suggesting they represent facets of a unified construct the researcher termed "Notification Burden Syndrome," a workplace stress syndrome characterized by pre-engagement anxiety, cognitive strain from managing multiple information streams, and generalized notification-related stress. Findings support Cognitive Load Theory and Conservation of Resources theory, demonstrating that notification overload depletes cognitive resources and creates sustained stress responses. Results suggest notification frequency represents a significant

occupational health concern warranting organizational intervention, including quiet hours, notification batching, and filtering systems.

### **3.06.12, “Is Social Media Hurting Our Love Lives?” [Poster]**

**Summya Adigun (Dr. Taylor Randolph, Sponsor)**

The empire of social media has gained traction in fostering new relationships, thanks to its accessibility and global growth. While social media’s rise worldwide has enabled communication, there have been questions about how it impacts romantic relationships. This research aimed to find whether different types of social media behaviors (general usage versus monitoring) affected trust levels and relationship satisfaction in college-aged students in romantic relationships. The participants of the study were sampled from college-aged students enrolled at Northwestern Oklahoma State University who are currently involved or were recently involved (in the past six months) in a romantic relationship, and college-aged students who fit this same criteria via social media recruitment. To measure general versus monitoring usage, the survey created by Kostiw (2024) defined and tested each variable based on questions scaled by the Rensis Likert’s 5-point frequency (Likert, 1932), 5-point likeliness scale (Likert, 1932), and Aiello and Czepiel’s 5-point unipolar scale (Aiello & Czepiel, 1979). The results concluded that there was a moderate positive correlation found between monitoring usage and trust levels; higher levels of monitoring were associated with lower levels of trust in a romantic relationship. However, there was no significant correlation between monitoring usage and satisfaction levels or between general usage behaviors and trust and satisfaction levels.

### **3.06.13, “Effects of Anxiety in Classroom Participation by College Students” [Poster]**

**Libbie Mabra (Dr. Taylor Randolph, Sponsor)**

Anxiety is becoming apparent to be an issue within college campuses. The relationship between anxiety and academic success was evaluated in this study. A sample of NWOSU college freshmen were asked to complete two surveys. These students were required to fill out a questionnaire that measured anxiety levels and recorded academic performance. Academic performance was measured via the participant's self-reported Grade Point Average. Interference of anxiety’s effects were expected to be found. Participants who had higher anxiety levels were assumed to also elicit struggles regarding academic success.

### **3.06.14, “The Relationship Between Regular Physical Exercise and Academic Performance in Undergraduate Students” [Poster]**

**Hope Kerchan (Dr. Taylor Randolph, Sponsor)**

This study examined how regular exercise affected university students’ academic performance. The purpose of the study was to determine whether exercise frequency and academic achievement, as determined by GPA and self-reported cognitive function, were significantly correlated. Surveys were distributed to a wide range of undergraduate students to gather information on their academic achievement, fitness levels, and exercise routines. Results indicated that no significant correlations were found between exercise frequency, time, intensity, or activity type and GPA. However, time management showed a moderate, positive, and statistically significant correlation with GPA, which shows that students with better time management tend to have higher GPAs. Strong positive correlations were

observed among the exercise variables, but physical activity did not significantly predict academic performance. These findings suggest that while exercise supports general well-being, time management emerged as the strongest reason for academic success.

### **3.06.15, “The Impact of Social Media on Self-Esteem” [Poster]**

#### **Kalynn Egleston (Dr. Taylor Randolph, Sponsor)**

Social media plays a significant role in today's world. Many people spend time every day on social media. This study aimed to explore the relationship between social media use and self-esteem levels among young adults aged 18 and older. The researcher has investigated whether more time spent engaging in activities on social media leads to low self-esteem. Compared to young adults who spend less time on social media, the researcher predicted that young adults who spend more time on social media will have lower self-esteem levels. Participants in this study answered questions in a brief survey to determine where they stand on self-esteem and time spent engaging in social media. The results were analyzed using the correlation/regression model.

### **3.06.16, “Experience as Catalyst to Counteracting Social Prejudice”**

[Poster]

#### **Dr. Taylor Randolph, Faculty**

In this poster, the lead researcher explores one of the primary themes that emerged from a multiple case study conducted with Licensed Professional Counselors (LPCs) in the state of Oklahoma. Two white, Christian LPCs from northwest Oklahoma were asked questions by the researchers regarding referral behaviors as they related to counseling people who were “gay” in light of the counselors’ Christian belief systems. While ethical considerations were the primary drivers of the initial case study, through qualitative analyses, the researchers uncovered a strikingly similar process of change reported by both participants. Participants described a sequential pattern of increasing acceptance in which early interaction with racial minorities reduced prejudice toward racial outgroups, and later, similar contact with gay individuals fostered greater acceptance of sexual minorities. Both participants independently described a process toward gradual acceptance through exposure and interaction with outgroup members. The method, results, and implications for theory and practice are discussed.

## ***Liberal Arts***

### ***4.02 English***

#### **4.02.01, “Memory as Resistance in Monique Truong’s *Bitter in the Mouth*” [Paper]**

##### **Ashland Crites (Dr. Christina Xan, Sponsor)**

Monique Truong’s *Bitter in the Mouth* uses Linh-Dao Nguyen’s disability (Synesthesia, tasting words in this case) to examine and resist patriarchal binaries. Truong judges Linh-Dao’s suburban life’s expectations for her against this standard; however, she makes present an absent criteria. Linh-Dao’s first memory is a taste, but she considers the word a secret within her mysterious heart. This creates a bodily dichotomy that is difficult for her to ignore. She



says her memory, and life, is like a playing card deck thrown onto the floor, and placing them back in order means accepting that they are not. Her grandmother, the queen of hearts, spreads her hearts into a field in which Linh-Dao's life falls. Acknowledging that life, and memory, is non-linear allows her to fully explore her identity throughout time. Opposing herself against the queen centers matriarchal lineage, rather than patriarchal lineage, allowing her to question America's southern expectations for her gender. Her synesthesia guides her journey to place the cards back into order, but intrusive male presences make this increasingly difficult. Linh-Dao describes her disability as incomings that are easily controllable, but her connection with history and artifice are inherent within the text. Her compulsive meaning-making moves her consciously, and subconsciously, incongruous to American southern stereotypes; thus, she actively examines them as a result. This paper argues that the relationship between Linh-Dao's synesthesia and America's southern expectations for femininity rejects patriarchal confinements.

#### 4.04 History

##### 4.04.01, "George Washington's Mount Vernon Estate" [Poster]

###### Elizabeth Terbush (Prof. Jana Pittman, Sponsor)

Public historians play a major role in shaping the understanding of the past. They do this by engaging diverse audiences beyond academic settings. George Washington's Mount Vernon home and estate is an example of historic preservation for future generations. The estate encourages this through its preservation of statues, historical sites, and a museum that collectively fosters education and understanding. The efforts of public historians and the community helped the estate encourage visitors to see George Washington not only as a national figure, but also as a complex and imperfect person. This interpretation humanizes Washington while addressing both his unfathomable accomplishments and the more difficult aspects of his life. This includes the owning of slaves at Mount Vernon Estate, now thought of as a plantation. Through evidence-based interpretation and use of critical thinking skills, the site encourages historical empathy and challenges visitors to compare their beliefs with harsh realities. By situating Washington's life within the broader social and cultural contexts of the eighteenth century, Mount Vernon promotes a better understanding of historical empathy that connects the past to the present. Such public history practices ensure the continued relevance of historical sites and preservation for future generations.

##### 4.04.02, "Restoring Women's History in Public Spaces: The Role of Public Historians in Education and Interpretation" [Poster]

###### M'Cheila Rader (Prof. Jana Pittman, Sponsor)

Public history plays a crucial role in shaping how the public understands women's historical contributions. This research examines how public historians reinterpret and present women's stories through museums, historic preservation, and interpretive work. Drawing from an interview with a historical interpreter at the Pioneer Woman Museum and a critical review of *Restoring Women's History through Historic Preservation* (edited by Gail Lee Dubrow and Jennifer B. Goodman), this study explores how women's history is demonstrated in the public sphere. The book's essays argue that preserving women's history requires more than inclusion but demands structural change in interpretation, preservation, and education. Similarly, the Pioneer Woman Museum's interpretive practices demonstrate how public historians make women's lived experiences visible and relatable to contemporary audiences.

Together, these sources reveal that public history not only preserves the past but also challenges traditional narratives by centering women as active agents of history.

#### **4.04.03, “From Ashes to Archives: Oral Tradition as Historical Evidence of the Tulsa Race Massacre” [Poster]**

**Heatherene Merrill (Prof. Jana Pittman, Sponsor)**

This study investigates the importance of oral tradition in the preservation of the historical memory of the 1921 Tulsa Race Massacre. Traditional accounts have been archived that depict the violence that devastated the Greenwood District, an area better known as “Black Wall Street,” but the oral histories that came from generations of survivors offer a more personal, unfiltered portrait of the moment. This project is based on the narratives of the descendants of two surviving families that stayed in Greenwood after the massacre. Their testimony reflects the sheer devastation of such a vibrant Black community, but also, how, still today, resilience, agency and cultural continuity were also the things that enabled families to pick up where they left off, to survive and move forward. Through oral tradition, the Tulsa Race Massacre becomes much more than a historical event; rather, it becomes a passed-down trauma and individual and collective testimony woven into the fabric of family life. The stories of the descendants tell of events in an alternative way, and they often are omitted from the written records. These narratives recount the terror and bewilderment that the night armed mobs raided, their methodical damage to property, and the psychological price of displacement. They also record acts of bravery, close neighbors sheltering neighbors, people fleeing gunfire, community leaders organizing efforts to rebuild even as state or federal restitution was not forthcoming. In addition, there is an alternate set of theories as to what trigger the massacre. Such accounts combat historical silencing by keeping what official papers omitted or misrepresented. This research reinforces that oral tradition is an honest and critical form of history taking.

## ***Math & Science***

### ***6.01 Biology***

#### **6.01.01, “Prevalence of Hookworms in Northwest Oklahoma and Effects of Habitation on Infection” [Poster]**

**Ko Brooks (Dr. Nicholas Ledbetter, Sponsor)**

Hookworms (*Ancylostoma* spp.) are a common endoparasite of domestic dogs in the United States. Habitation has been shown to influence the overall health of dogs, with dogs living primarily outdoors having weaker immune systems and higher prevalence of parasitic infection. Here we compare the hookworm load of dogs housed indoors versus outdoors in Northwestern Oklahoma to understand how the environment and habitation may affect infection prevalence. Overall, we found a 50.4% infection rate in outdoor dogs, a 38% rate in mixed habitation dogs, and a 7.4% rate in indoor dogs. We found a significantly higher hookworm load in dogs that were housed outdoors compared to those that were housed indoors. Our results align with other findings suggesting that outdoor dogs are more susceptible to parasitic infections.

## 6.02 Chemistry

### 6.02.01, “Study of Iodine Distribution and Concentrations in Western Oklahoma Brine Waters and Recycling of Used Chloroform” [Poster] Amanda Lane & Alaina Pierce (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 and NWOSU created a partnership 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, which has led to the construction of six new plants. 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 rather 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 with up to a 93% recovery.

### 6.02.02, “Progress Towards Green Pericyclic Reactions” [Poster] CeCelia Vandiver (Dr. Adam Alber, Sponsor)

In organic chemistry, the Diels-Alder reaction is essential for the synthesis of cyclic compounds. This reaction and others like it are known as pericyclic reactions and are identified by the formation of a ring in which only the electrons move for its formation. In current literature, these reactions have extreme requirements that are unrealistic to perform in undergraduate labs such as high temperatures, long reaction times, and hazardous solvents. To make this reaction more accessible to primarily undergraduate institutions (PUIs), we will present our progress towards developing methodology for an Inverse-Electron-Demand-Hetero-Diels-Alder reaction. Traditionally, the Diels-Alder reaction relies on an energy gap between the Highest Occupied Molecular Orbital (HOMO) of a diene and the Lowest Unoccupied Molecular Orbital (LUMO) of a dienophile. This gap is often relatively low which makes elevating the electrons in the HOMO to the LUMO fairly trivial. However, the inverse, elevating the electrons from the HOMO of the dienophile to the LUMO of the diene, has a much larger energy gap making this Diels-Alder transformation more difficult. This methodology utilizes microwaves to lower the high energy barrier intrinsic to these inverse-electron-demand reactions while eliminating the need for harsh solvents, high temperatures, and long reaction times required for normal-electron-demand reactions. Once optimized, this methodology will serve as a foundation for future exploration into ‘on-water’ and [2+2] cycloadditions under the principles of green chemistry. These novel techniques will provide undergraduate students unique experiences that will help prepare them for a future in a synthetic organic chemistry laboratory.

## 6.06 Nursing

### 6.06.01, “Effects of Early vs Late Enteral Nutrition” [Poster]

**Ashley Webb, Courtney Koeppen, & Shayla Burris**

**(Dr. Heidi Ritchie, Sponsor)**

**Background:** Critically ill patients are highly catabolic, and malnutrition is a crucial factor associated with poor patient outcomes. Optimal feeding strategies are often a matter of debate due to the increased metabolic needs that Intensive Care Unit (ICU) patients are often challenged with. Adequate nutrition cannot always be achieved by the oral route alone, it sometimes must be supplemented for additional support or for other inhibiting factors.

**Objective:** Early enteral nutrition is recommended in many clinical practice guidelines, although there is a lack of evidence for its use and benefit. This research was aimed at studying the effects of initiating enteral nutrition early (within 48h) rather than late (after 48h) of admission to ICU.

**Methods:** This research included 10 studies that included systematic reviews, meta-analysis, observational studies, and random-control trials (RCTs). All but one study was conducted within the last 5 years. Keywords: Nutrition, Enteral Nutrition, Complication, Outcomes.

**Results:** Early enteral feedings were significantly associated with reduced 28-day mortality, lower incidence of mechanical ventilation, and a shorter ICU stay. Delayed enteral nutrition was associated with higher mortality risk and prolonged ICU stay in surgical patients, whereas no associations were found in medical patients.

**Conclusions:** Benefits of early enteral feedings may be influenced by individual patient factors and disease severity. There should be further research done to tailor enteral feeding strategies to optimize outcomes related to various populations and patient factors.

### 6.06.02, “Effects of Prenatal Education on Postpartum Depression”

[Poster]

**Tatum Brown, Lainey Coley, & Shyanna Stopp**

**(Dr. Heidi Ritchie, Sponsor)**

Postpartum depression (PPD) will affect up to 17% of new mothers worldwide. PPD can significantly impact maternal well-being, infant development, and family relationships (Uebelacker et al., 2015; Sawyer et al., 2019; Missler et al., 2020). This evidence-based practice project examined whether structured prenatal education and therapy, compared to non-structured therapy, reduces the incidence of PPD within the first six months postpartum. A review of eight peer-reviewed studies revealed consistent evidence supporting early screening, education, and intervention as key strategies for prevention. The interventions include prenatal yoga, nurse-moderated mobile applications, psychoeducation programs, and supportive counseling. These interventions were found to enhance maternal coping, increase confidence, and promote early help-seeking behaviors. Many studies were limited by small sample sizes and short follow-ups, but collective evidence supports combining mental health education into prenatal care to improve early detection and outcomes. Nurses play a critical role in screening, education, and referral for at-risk mothers. Implementing evidence-based interventions during pregnancy can strengthen the mother-infant bond, reduce depressive symptoms, and improve overall postpartum adjustment. More research is still needed with different populations to make these resources more accessible and find what works best for all mothers.

### **6.06.03, “In Pregnant Women in Labor, How Does the Use of Dexmedetomidine Compared to Traditional Opioids for Epidural Analgesia Affect Maternal and Fetal Adverse Effects During Labor?”**

[Poster]

**Baleigh Stewart, Patricia Collins, & Nancy Klippenstein  
(Dr. Heidi Ritchie, Sponsor)**

This evidence summary explores the effects of dexmedetomidine compared to traditional opioids for epidural analgesia in pregnant women during labor, focusing on maternal and fetal adverse outcomes. The goal was to determine whether dexmedetomidine offers safer and more effective pain control while minimizing side effects. Research information was gathered from multiple randomized controlled trials and meta-analyses published between 2019 and 2024. Across studies, populations consisted of healthy pregnant women aged 20–35 years at term, undergoing labor with epidural anesthesia. Findings consistently demonstrated that dexmedetomidine significantly improved the onset and quality of analgesia, reduced procedural pain, and resulted in fewer adverse effects such as nausea, vomiting, and pruritus compared to opioids. Additionally, maternal satisfaction was higher and fetal outcomes, including Apgar scores, remained within normal limits. While limitations included small sample sizes and lack of dosing standardization, the overall results suggest that dexmedetomidine is a promising adjuvant or alternative to opioids for labor analgesia. This drug is not approved for use in the United States by the Federal Drug Administration. Further large-scale, multicenter research is recommended to confirm safety, optimize dosing, and assess long-term maternal and neonatal outcomes.

### **6.06.04, “Cardiovascular Disease vs. Daily Exercise” [Poster]**

**Kylie Morgan, Madison McMahon, & Katelynn Cooper  
(Dr. Heidi Ritchie, Sponsor)**

Cardiovascular disease has the leading mortality rate in the United States, with studies showing there is a myocardial infarction-related death every 40 seconds. Research also states that as of 2022, only 25.3% of adults in the United States participated in aerobic activity and muscle-strengthening exercises. Considering this data, we wanted to determine the correlation between lack of exercise and cardiovascular diseases and injuries. We researched data to determine if any exercise methods led to a reduction in cardiovascular-related deaths. We conducted research using a variety of sources that consisted of quantitative, qualitative, and systematic reviews. Results indicated that adults who include 30 minutes of exercise in their daily routine were at a decreased risk of becoming hospitalized, experiencing a major adverse cardiac event, or dying, and had an improvement in mental health, cardiac function, physical function, left ventricular systolic function, and quality of life.

### **6.06.05, “Skin to Skin Contact After Cesarean” [Poster]**

**Kalle White, Cheyenne Kahoe, & Elizabeth Carillo  
(Dr. Heidi Ritchie, Sponsor)**

Does skin-to-skin contact to promote breastfeeding and mothers who deliver vaginally or via C-section? The review of literature reveals beneficial tools to help mothers achieve immediate skin-to-skin contact after births such as bonding, greater success rates of breastfeeding and the regulation of the baby's temperature. In addition to showing positive

benefits to skin-to-skin contact, the research demonstrates that those who did not have immediate skin-to-skin contact following their births show the need to use formula to supplement, due to their milk not coming in quickly enough. Our purpose for looking into this study was to determine how the effects of skin-to-skin contact help with promoting breastfeeding. There were a few different methods used in this research, qualitative, quantitative, systematic reviews, and there was also a questionnaire that was used to determine the effectiveness of skin-to-skin contact within the first hour after birth. In conclusion, with the research found, there is there are greater success rates of breastfeeding when there is skin-to-skin contact performed within the first hour after birth, vaginal and C sections. It also shows that there can be more research to help improve the success rates for the future mothers and babies.

#### **6.06.06, “ADHD: Does Screening and Treatment of Attention-Deficit-Hyperactive-Disorder Provide Protective Effect Against Substance-Use-Disorder?” [Poster]**

**Dan Simon, Rustin Marrow, & Rachel Martin  
(Dr. Heidi Ritchie, Sponsor)**

There has been concern in recent years that children are being overdiagnosed or overmedicated for ADHD. We sought to answer the question of what the consequences of underdiagnosis and undermedication of ADHD might be for developing SUD related to self-medicating. The current standard of care for ADHD is the use of stimulant medications and cognitive therapy, although non-stimulant options are becoming more popular. We searched WorldCat.org and the Cumulative Index to Nursing and Allied Health Literature (CINAHL), focusing on articles published within the last 5-10 years. We utilized the keywords ADHD, substance use disorder, and self-medication, and limited the article selection to the United States and several studies conducted in Europe. The literature reveals a link between ADHD and SUD and self-medicating, and that treating the symptoms minimizes the risk of developing substance use disorder. Therefore, more vigilant screening and treatment of childhood ADHD is warranted.

#### **6.06.07, “The Effectiveness of Aromatherapy in Prevention of Postoperative Nausea and Vomiting” [Poster]**

**Sarah Decker, Danae Vendetti, & Daphne Zevallos De McCaslin  
(Dr. Heidi Ritchie, Sponsor)**

Postoperative nausea and vomiting (PONV) is an ongoing issue in post anesthesia care units (PACU) for patients who have received general anesthesia during surgery. The incidence of PONV increases healthcare costs and decreases patient satisfaction. A review of literature was conducted to determine the aromas that are most effective to treat cases of PONV in patients that had undergone surgery with general anesthesia. The results show that lavender, ginger, and peppermint are consistently effective to decrease feelings of PONV. Research demonstrates that supplying one or more of these aromas in the PACU for the treatment of PONV can decrease healthcare costs and improve patient satisfaction.

#### **6.06.08, “The Effects of Parental Health Literacy on Overall Child Health” [Poster]**

**Tejune Kim, Evan Silva, & Marcus Bueno (Dr. Heidi Ritchie, Sponsor)**

Parents play a vital role in the development of children worldwide. However, what happens when parents do comprehend the information that is needed to care for themselves or their children? The aim of this research was to shed light on the issue of parental health literacy and its impact on the overall health of children. For this research, data was obtained from the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Database of Systematic Reviews, and PubMed Central databases. Keywords included health literacy, parental, and pediatric outcomes. In total, 20 research studies matched the keywords used in the search. Out of the 20, 10 research studies were excluded because their health literacy definitions did not align with the definition used in this study. Ultimately, 10 research studies met the criteria for inclusion. All research published in the last 10 years indicates that children with health-literate parents have better health outcomes. Further research is needed to fully understand the issue in the United States. While there are specialized studies, more generalized research needs to occur. In clinical practice, implementing health literacy screening of parents before discharge, as well as providing a wider selection of educational materials, can improve health literacy and overall child health outcomes. The study reinforces the idea that parents with more information about their child’s disease, medications, treatment, and overall health make decisions that lead to better health outcomes for their children. This could empower change in healthcare facilities to increase the health literacy of parents.