

STUDENT
RESEARCH
SYMPOSIUM

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RESEARCH

THURSDAY, APRIL 25, 2024

Fairfield University

SESSION 1

Capstone and Course- Based Projects

- ◆ College of Arts and Sciences
- ◆ Dolan School of Business
- ◆ Egan School of Nursing and Health Studies
- ◆ School of Education and Human Development

Ukraine's Fight Against Russia: America's Next Endless War?

Evan Arnold

Faculty Mentor: Dr. Gayle Alberda

College of Arts & Sciences

Booth: 40

Abstract:

In the two years since Vladimir Putin launched his invasion of Ukraine on February 24th, 2022, President Joe Biden and the United States Congress have sent \$78 billion in financial and military support to the Ukrainian forces. With no off-ramp in sight, and the fighting in Ukraine having come to a near stalemate, Americans have been left wondering how the United States ought to proceed with their involvement in this foreign conflict. One policy option that is available to the federal government is brokering a deal between President Putin and President Zelensky that requires both sides to make concessions to bring an end to the war. However, years of relentless fighting have proven that neither side seems enthusiastic about coming to the negotiating table. There are multiple alternative approaches that the United States can take regarding its involvement in this conflict that my research project will analyze to determine which will be the best for all parties involved. I will use Eugene Bardach's Eight-Fold Path to conduct a policy analysis of the several options available to the United States and evaluate their effectiveness, financial costs, and reflection of America's interests both internally and regarding foreign policy. It is my prediction that forcing the hand of both President Putin and President Zelensky into a settlement will be the best option for the United States. While policymakers need to examine all options, the United States must learn from its past mistakes in involving itself in never-ending wars and determine the best way to bring this conflict to an end.

Got Water? Alternative Community Water Sourcing in the Rio Verde Foothills, Arizona

Amelia Bowles

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Booth: 41

Abstract:

The Rio Verde Foothills comprise a small, rural community outside of the Scottsdale city limit in Arizona. With the city of Scottsdale's water municipality facing limitations in extending services to Foothills residents due to growing water scarcity and infrastructural constraints, this research project aims to find the best alternative water source to ensure continued access to a crucial resource. Current scholarship outlines the challenges and complexities of managing water resources in a desert environment, highlighting the need for holistic approaches to ensure long-term water access for all Arizona residents. The most widely agreed upon solution is the development of a new standpipe and hauling service separate from the Scottsdale water municipality and dedicated to residents of the Rio Verde Foothills. Building upon existing literature, this project utilizes Eugene Bardach's Eightfold Path to comparatively analyze the viability of four water sources. The data was collected through convenience samples, interviews with local stakeholders, and local policy publications. I contend that the development of a new standpipe will be the most suitable community water source for residents of the Rio Verde Foothills, based on limited information regarding these four criteria: social feasibility, economic feasibility, effectiveness, and sustainability. This research contributes to the broader conversation on equitable water access in rural communities, as increasing regional water scarcity will be most heavily felt by rural communities left disconnected from critical water infrastructure.

Boston to Ban Alcoholic "Nips"

Megan Brady

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College of Arts & Sciences

Booth: 42

Abstract:

The large majority of individuals in the city of Boston, Massachusetts have been found to dispose of 100ml "nips" of alcohol out of their car windows while in a moving vehicle. This raises concern regarding both the amount of roadside littering, and the convenient consumption of alcohol while behind the wheel at a faster speed to avoid arrest. It is possible that with the Boston banning nips, just as many other towns and cities have done, that it would deter individuals from consuming nips while operating a vehicle and reduce littering. Research shows that banning the 100ml alcohol nips reduces the number of alcohol related emergency calls, yet little to no impact on reducing roadside litter. Therefore, the nip ban might not be as useful environmentally, but more beneficial in the prevention of people driving under the influence or public drunkenness. Moreover, educating liquor store employees/owners on the implications of selling nips, and having them keep note on regular customers who may need greater help, works in the form of a "do not sell" list. For example, Newton, Massachusetts has already adopted this policy. I use Bardach's Eightfold Path to conduct a policy analysis on nips. I examine four policy solutions to this problem and evaluate each solution using four criteria: public safety, environmental aspects, cost/financial feasibility, and efficiency. I contend that a ban on nips will have minimal effects on the improvement on the environment in Boston. However, it is an adequate and effective implementation in limiting the number of impaired drivers. Although it is possible to educate civilians and liquor store associates on the safety and environmental implications of selling 100ml nips, it has been found that an overall ban has had a larger numerical impact on preventing drunk driving immediately. This research helps us examine different means to reduce drunk driving in the City of Boston and the feasibility of a city wide ban of nips.

Levels of Political Engagement of Students at Fairfield University

Emma Clifford

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Booth: 43

Abstract:

This research sought to answer the question of: What is the level of political engagement of students at Fairfield University? Fairfield University is a Private White Institution (PWI), with this, it was expected for survey results to be skewed in a number of ways. To begin, the majority of respondents, if not all, would be caucasian. With personal previous experience, political engagement and knowledge levels were expected to be very low. In addition, it was expected that the majority of students wouldn't hold strong political opinions, and if they did, their views would be largely conservative. The background knowledge is essential to the understanding of this survey's purpose and its results. This survey enhances the level of knowledge regarding the average levels of political engagement and knowledge of a Fairfield University student. Overall, very few surveys sent out amongst the university are politically focused. This survey allows for greater insight into the levels of political engagement amongst Fairfield University students. Data to support this claim was collected through a convenience sample with 47 participants. Questions were varying in content, ranging from measuring support of current and former United State Presidents, to possible relevant issues. In the end of this survey, valuable data was collected, with results demonstrating that students at Fairfield University are only moderately engaged in politics. Students have some common knowledge regarding politics, but overall, political knowledge levels are low. In conclusion, students at Fairfield University are not highly engaged in politics.

A Policy Analysis of Speed Cameras and their Alternatives

Adele Hayes

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Booth: 44

Abstract:

Speed cameras have fairly recently been introduced in Connecticut. They have primarily been cited as a deterrent for speeding, especially in construction zones. Construction zones are notoriously unsafe for their workers, however, this does bring into question whether this is the best option for preventing unsafe working conditions for both the state and construction workers. Research has shown that speed cameras do reduce the likelihood of speeding and casualties related to it, although this data varies in its impact. This brings into question whether it is truly the best option, as the data displays different levels of effectiveness for speed cameras. Other alternatives could be for higher police presence, raised intersections, radar speed signs, and signs indicating a construction zone ahead. Using Eugene Bardach's eightfold path, I will conduct a policy analysis of four different policy options (the aforementioned) using four different criteria, safety, effectiveness, costliness, and productivity. I contend that speed cameras will not be the best policy option for construction zone safety. It is integral that all states consider various policy options before implementing speed cameras in order to keep construction zone workers safe. The option that meets all four criteria to the highest standards would be ideal as it is beneficial to both the government and workers themselves, as it would assure the best possible outcome for citizens, the government, and construction workers.

Improving Reading Proficiency Through New Standards: A Policy Analysis

Kathleen Kerr

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Booth: 45

Abstract:

There has been a decrease in reading proficiency throughout the United States, resulting in low literacy scores for students nationwide. One policy option is for school districts' reading curriculum to be determined by each school district in, which they create their own policy to follow. Research shows that individual school districts developing their own reading curriculum has mixed results in effectiveness. Although this is a viable policy option for states to give more freedom to school districts regarding how to conduct a reading, a nationwide standard for reading policies and techniques can improve reading scores. Using Eugene Bardach's Eightfold Path, I conducted a policy analysis to evaluate four policy options that would increase reading proficiency and reduce dropping literacy levels using the four criteria: economic feasibility, effectiveness, responsiveness, and efficiency. I contend that national standards in reading curriculum are the best policy for improving reading proficiency and literacy levels. All of the state's boards of education need to consider alternative methods to establish a national reading curriculum standard before allowing each school district to create its own. Understanding the implications of other policy options is important for state education policymakers nationwide.

Surveilling Your Vote: Restoring Election Integrity After the Bridgeport Ballot-Stuffing Debacle

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Booth: 46

Abstract:

In 2023, the Bridgeport Democratic primary results were overturned by a judge due to the mishandling of absentee ballots in one of the city's ballot drop boxes. While allegations of voter fraud via absentee ballot drop boxes in the United States are infrequent, lawmakers in Connecticut are pursuing changes to the law to require security cameras at drop boxes. Research on mechanisms to improve voter security and drop box integrity is minimal to nonexistent, primarily focusing on the correlation between the box's distance and voter turnout. While the legislature focuses on requiring video surveillance near the boxes, other jurisdictions have implemented alternatives that have led to similar outcomes the legislature is pursuing. This policy analysis will determine which alternative holds the best likelihood of success. To do this, I will use Eugene Bardach's Eightfold Path to consider which options increase voting integrity at the drop box, considering four criteria: increased perception of voting integrity, effectiveness, economic feasibility, and efficiency. I contend that while video surveillance on drop boxes is a good reactionary policy, it's not the one that guarantees the most benefits in relation to the policy goals. Because election security has become a bigger concern in the US political discussion, it is crucial policymakers consider a wide range of options that can achieve the goal of making elections more secure for those voting absentee.

The Deadly Consequences of Capital Punishment: A Policy Analysis

Colin Olivieri

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Booth: 47

Abstract:

With a particular interest in the criminal justice system and reform, I researched the use of capital punishment within the United States as a viable sentencing option. Despite some criticism, the American correctional system has remained an important pillar in American society. In order to create a more perfect union, analyzing the recent criticism surrounding the death penalty is instrumental in ensuring a better correctional system. While the surveys of the American public show an overall mixed response to the death penalty, it still remains a sentencing option for many states and the federal government. Is capital punishment an effective and just form of punishment for the criminal justice system? The main critiques that surround the death penalty are its failure to be implemented in a just and fair manner, as well as creating an undue burden on the taxpayer. All the while, the constitutionality of the death penalty has been in the air for quite some time. To effectively analyze the different policy options, I am employing Dr. Bardach's Eightfold method to view these alternatives and understand the specific costs and benefits that come with each. It is important to weigh these values against the death penalty and other policy alternatives to see if it is worth all of the resources being used to implement it. Upon researching and reviewing the potentially viable alternatives, such as life without parole, indeterminate prison sentences, and determinate prison sentences, the results suggest the cessation of the death penalty is the preferred policy recommendation. Policymakers should seek to implement long indeterminate prison sentences to those accused of serious criminal offenses.

The Rising Homeless Population: A Policy Analysis

Jenna Simonelli

Faculty Mentor: Dr. Gayle Alberda

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Booth: 48

Abstract:

The National Violent Death Reporting System defines homelessness as any persons who currently reside in any places that are not designed for or ordinarily used as regular sleeping accommodations for human beings (NVDRS, 2022). These places may include a car or other private vehicle, a park, the streets, any outdoor location, an abandoned building, a bus or train station, or any camping grounds (NVDRS, 2022). The population affected by homelessness is not specific to any age, gender, race, or any other distinctive feature that one may possess. Unfortunately, any person can end up in a situation that results in a loss of housing or permanent shelter. The research I have conducted aims to propose any suggestions that could be implemented to improve Connecticut's Uniform Relocation Assistance Act. This act proposes that any individual or business displaced from their residence due to state or local government acquisition may be entitled to advisory assistance and financial compensation (2-1-1 Connecticut, 2023). As recent studies have shown that over half a million people experienced homelessness throughout the United States in January 2020, I believe that this policy has the potential to help a lot of people experiencing homelessness. Similar to previous studies, I aim to develop alternative methods to reduce the homeless population through the policy enacted by the Connecticut state government. A thorough policy analysis, using Bardach's Eightfold Path, will explore where Connecticut's Uniform Relocation Assistance Act could be improved, if it has been effective since implementation, and whether Connecticut should be the target population for the policy.

What's on your plate? Endocrine-Disrupting Food Alternatives and Perceptions of Food Safety

Abigail Pike

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Egan School of Nursing & Health Studies

Booth: 49

This research was also presented at the American Society for Nutrition- Boston 2023

This research was supported by the McGuinness Fund

Abstract:

Endocrine disruptors in household products, especially consumable food products, can have short and long-term adverse impacts on health including disruptions in female reproductive functions by endocrine disrupting chemicals may result in infertility, improper hormone production, endometriosis, menstrual cycle abnormalities, anovulation, and decreases sperm count, and ovarian cysts (Pizzorno, 2018). Specifically BHA (butylated hydroxyanisole) and BHT (butylated hydroxytoluene) are commonly found in processed food products such as cereals, granola bars, processed meats, and dairy products. In the US, as compared to other international contexts, very limited food product regulation related to endocrine-disrupting compounds exist. Consumer awareness of food product safety is limited and little research has documented consumer awareness specifically related to endocrine-disrupting products, potential alternatives, and health impacts. Comparable products are available for most food categories that offer healthier alternatives. The purpose of this study is to examine public perception of food products, food product choice and understanding of health implications of EDCs (BHA/BHT). Specifically, the aim is to explore knowledge related to the safety of foods with known endocrine disrupting compounds and provide comparisons of alternate, healthier products through a systematic survey of eating patterns, habits, and preferences of Americans. Synthesizing this data will help elucidate the extent to which awareness of food product safety impacts our food choices and ultimately our long-term health. In this comparative study the aim is to assess the level of knowledge and awareness among the public compared to a college aged population, investigating discrepancies in perception between these groups. The hypothesis is that there will be no significant difference in the level of public knowledge about endocrine disruptors and their health implications across different age groups, reflecting an overall low awareness of endocrine-disrupting products. This study will be used to inform a policy brief discussing the importance of stricter restrictions on harmful chemicals in food products.

Gender and Exercise among Users of a Campus Recreational Facility

Philomena Appiah

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Booth: 50

Abstract:

It is recommended that adults engage in regular physical activity to maintain good health, including 150 minutes of moderate-intensity exercise weekly, supplemented by muscle-strengthening activities on at least 2 days each week. Despite these guidelines, gender disparities exist in physical activity engagement, particularly in strength or resistance training. This gap is concerning, especially for women, as resistance training is crucial for bone preservation, particularly post-menopause. Research suggests these gender differences are evident in gym environments, with women typically underrepresented in strength training areas. College Campus Recreation Facilities (CRFs) reflect and reinforce these gender norms, with college students associating specific exercises with one gender or another. Women face challenges in engaging in certain types of exercise, including resistance training, due to lower levels of engagement and confidence compared to men. Motivators such as improved athletic performance positively influence exercise engagement, while barriers such as self-consciousness and societal pressures hinder women's participation. The primary purpose of this research was to investigate gender differences in the use of a CRF for different types of physical activities among college students, focusing on aerobic versus strength training. I administered an online Qualtrics survey to eligible undergraduate students to assess their exercise patterns, comfort levels in different areas of the CRF, motivations for exercise, and knowledge about strength training and aerobic exercise. I employed appropriate bivariate statistical tests to compare these outcomes between women and men.

Reasoning Behind Distrust in Pharmaceutical Companies

Caitlin Clayton

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Booth: 51

Abstract:

The study was conducted as an online survey using Qualtrics and distributed through social media platforms like Facebook and Instagram to participants over 18 years old. Data collection occurred over a span of 10 days, from a random sample including the Facebook group “Wall Township Locals” and other contracts. The survey consisted of 21 questions covering socio demographic variables, political affiliation, healthcare work, Covid- 19 pandemic attitudes, vaccine status, trust in providers, and distrust in pharmaceutical companies.

The research highlighted common distrust among Americans. The emergence of Covid-19 contributed to fluctuations in trust, which was influenced by scientific research, policies, and social media information. This inconsistency led to confusion and increased distrust in pharmaceutical companies and government systems, particularly among vulnerable populations facing healthcare barriers. The study suggested a link between the opioid epidemic and heightened skepticism towards the pharmaceutical industry, as 'big pharma' was often blamed for the crisis. Evidence indicated that distrust may have increased due to the Covid-19 pandemic and opioid epidemic, but further research was needed to understand their exact impact. The study's purpose was to investigate factors contributing to distrust in pharmaceutical companies, including historical context, social implications, and the roles of the opioid epidemic and the Covid-19 pandemic, while considering factors like race, gender, and political views.

The Impact of Social Media on Mental Health

Victoria Dadourian

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Booth: 52

Abstract:

Social media has become an integral part of modern society, influencing various aspects of individuals' lives, including mental health. This research explores undergraduate Fairfield University students and the relationship between social media usage and mental health, with a specific focus on depression and anxiety. Existing research describes a complex interplay between social media usage and mental health outcomes. While some individuals report positive effects of social media use such as social support, connection, and information sharing, others highlight negative experiences such as comparison, cyberbullying, and feelings of inadequacy. Research suggests potential moderating factors may include age, gender, duration of social media use, and types of platforms utilized. The implications of these findings are significant for mental health professionals, social media platforms, and individuals themselves. By gaining a better understanding of how social media impacts mental health, targeted interventions and strategies can be developed to promote positive usage patterns and mitigate negative effects, ultimately contributing to improved overall well-being in the digital world. The primary purpose of this research was to investigate the relationship between social media usage and mental health among Fairfield University undergraduate students. To assess this relationship, I administered an online Qualtrics survey including questions from the Rosenberg Self-Esteem Scale (RSE), the Personal Health Questionnaire Depression Scale (PHQ-8), and General Anxiety Disorder Scale (GAD-7). I then compared scores for each these scales by reported frequency of use of Instagram, TikTok, and Snapchat.

The Impact of Therapy-Dog Sessions On-Campus on the Moods of Fairfield University Students

Lucy Kraut

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Egan School of Nursing & Health Studies

Booth: 53

Abstract:

Students attending college often face a variety of mental health problems due to academic pressures, separation and individuation from family/friends, and work responsibilities. Learning how to cope with these stressful situations is important for developing good relationships, time management, and future career success. At Fairfield University, faculty and students have provided resources to help those struggling with mental health, but many students are still either not aware of the kinds of counseling the university offers, or don't feel comfortable reaching out. Several events have been held in the last few years with Fairfield's own therapy dog, and many students gave positive feedback about her presence and her effect during stressful academic periods. The primary purpose of this research was to investigate the impact of therapy dog sessions on campus on students' moods. To assess this effect, I administered an online Qualtrics survey to students after interacting with the therapy dog during a Wags and Wellness event at the University library and compared the data with students who did not interact with the dog in the same location. The survey included questions from the State-Trait Anxiety Inventory (STAI) test, where participants are asked to identify how strongly they feel about certain mood statements.

Navigating Dietary Supplement Use Among Division 1 Collegiate Athletes: An Educational Intervention Study at Fairfield University

Hans Lim

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Egan School of Nursing & Health Studies

Booth: 54

Abstract:

The escalating trend of dietary supplement use among collegiate athletes, coupled with the risks associated with unregulated products, prompted my focused investigation into effective educational strategies at Fairfield University. The purpose of my project was to evaluate an educational fact sheet/infographic designed to improve athletes' understanding of dietary supplements, including their potential risks and the significance of regulatory compliance. The ultimate goal of this educational intervention is to empower student-athletes with the knowledge required to make safer, more informed decisions regarding their supplement intake, in doing so fostering better health outcomes and compliance with anti-doping regulations. Utilizing a pretest/posttest design, I distributed a questionnaire to Division 1 collegiate athletes from various sports teams, assessing changes in their dietary supplement knowledge and attitudes before and 1 week following the educational intervention. My primary aim was to assess the effects of the educational intervention on participants' knowledge. The results of this project can be used to guide future efforts in developing educational materials that can effectively address the complexities of dietary supplement use in athletic settings.

College Students' Knowledge and Attitudes Regarding Carcinogenic Ingredients and Additives in Foods

Bria Mullaghy

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Booth: 55

Abstract:

Previous research suggests a significant relationship between certain food additives and an increased risk of developing cancer. Some food additives, like nitrites and nitrates, are used as preservatives or to keep processed food "fresh". Some individuals may not know how to identify a harmful or carcinogenic additive, as well as being unaware that they may be consuming these additives regularly. The primary purpose of this study was to evaluate the attitudes and existing knowledge about carcinogenic ingredients in foods among undergraduate college students and determine whether they varied by gender, family history of cancer, or major. Participants completed a survey on Qualtrics that included demographic questions and assessed students' perceived knowledge about selected additives and the extent to which they wanted to avoid them.

Narcan Training and Opioid Prevention Education at Fairfield University

Kasey Reed

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Booth: 56

Abstract:

The purpose of this public health program evaluation project was to address the need for opioid overdose prevention education and skills among undergraduate students at Fairfield University. The aims of the evaluation were to assess: 1) students' retention of information from a classroom education component and 2) students' perceptions of an optional off-campus Narcan training. I administered a pre-test and post-test survey to participants of the overdose classroom education intervention and a separate survey to participants who received Narcan training provided by Fairfield University Collegiate Recovery Services and The Hub CT at an off-campus location. I hypothesized that participants' opioid prevention knowledge would increase after the classroom overdose prevention education and that most Narcan training participants would feel confident about administering Narcan after participating in the training.

Menstrual Health, Period Poverty, and Well-Being among Undergraduate Students

Aliyah Seenauth

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Egan School of Nursing & Health Studies

Booth: 57

Abstract:

Menstrual health encompasses physical, mental, and social well-being during the menstrual cycle, including access to resources, hygiene, and the ability to function effectively. Financial constraints related to menstruation can lead to mental health issues, such as depression, among college-aged women. Additionally, severe menstrual pain and dysmenorrhea contribute to absenteeism, reduced participation, and academic performance decline. Yet, there is limited research on the interplay of economic factors, academic success, and menstrual health. The overall purpose of this study was to investigate the associations between menstrual health and period poverty with health, academic outcomes, and overall well-being among Fairfield University undergraduate students. Additionally, the study looks at the extent to which menstrual health needs are being met by students on Fairfield's campuses, as well as students' knowledge about menstrual health. Understanding the associations among these variables is crucial to support student well-being and success. I distributed an online survey via Qualtrics to eligible students, who were Fairfield University undergraduate students identifying as menstruating individuals across campuses. The survey assessed knowledge on the menstrual cycle, perceived affordability of menstrual products, and perceived impact of menstrual-related problems on social life or academic performance. I conducted bivariate analyses to investigate relationships between predictor variables and outcome measures.

Knowledge & Comfort Levels of Automated External Defibrillators (AED's) Across the Campus Community

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Booth: 58

Abstract:

Cardiac arrest is a common cause of death globally, causing 300,000-450,000 deaths in the United States per year, according to the National Institute of Health. Survival rates vary significantly depending on the availability and utilization of Automated External Defibrillators (AEDs) and effective CPR. Automated External Defibrillators play a crucial role in improving survival rates from sudden cardiac arrest. Despite their widespread deployment, the use of AEDs by bystanders remains very low globally. This study investigates the knowledge and comfort levels of AEDs across the campus community of Fairfield University. Based on the well trusted American Heart Association, it is estimated that immediate defibrillation can enhance survival chances by up to 60%, this research aims to assess the readiness of Fairfield University's community members to respond effectively to incidents where an AED is necessary. Unfortunately most people who have a cardiac arrest do not receive treatment timely enough to survive, but when AEDs are used promptly, alongside CPR, there are significant increases in the chance of survival. Survival rates decline by approximately 10% with each passing minute without defibrillation, highlighting the urgency of bystander intervention. For this reason, it is important to promote the importance of AEDs, as they can save lives day after day. Using a mixed-method approach, participants were recruited through various platforms including text messages, GroupMe, email, QR codes, and in-person interactions. Eligible participants encompassed individuals directly associated with Fairfield University. Data collection was facilitated through Qualtrics, employing a 10-question survey supplemented by an AED fact sheet created specifically for this study. The survey delved into participants' familiarity with AEDs, their confidence in operating the devices, as well as their understanding of AED use protocols. At the midpoint of the survey, respondents were presented with an AED fact sheet elucidating a step-by-step guide on AED usage, coupled with campus-specific information regarding AED locations and protocols. The findings of this study will provide insight into the knowledge gaps and comfort levels surrounding AEDs within the Fairfield University community. By indicating areas of deficiency, this research aims to target the educational interventions aimed at enhancing AED utilization and empowering bystanders to respond effectively to sudden cardiac arrest incidents. Ultimately, the goal is to foster a campus culture that prioritizes AED awareness and proficiency, in an effort to maximize the possibilities for saving lives in critical situations. This research contributes to the broader discussion around public health and emergency preparedness, with implications for campus communities and other institutions seeking to improve AED utilization and knowledge, as well as improve outcomes in sudden cardiac arrest emergencies.

Comparing the Mental Health of Student-athletes and Non Student-athletes

Anna Sherman

Faculty Mentor: Dr. Kimberly Doughty

Egan School of Nursing & Health Studies

Booth: 59

Abstract:

The prevalence of mental health problems, including depression, anxiety, and low self-esteem, among college-aged students has reached an all-time high. College life can be demanding, with academic pressures, financial concerns, and social challenges, while the transition to independence contributes to heightened stress levels. Despite the availability of support services on campuses, students may face barriers to accessing mental health care, such as stigma, lack of awareness, long wait times for appointments, and concerns about confidentiality. Student-athletes not only struggle with mental health issues but there is such a stigma surrounding mental health and therefore they never feel confident enough to share or ask for help. Student-athletes are bound to have mental health struggles. In my study, I will strive to see the extent of these mental health issues, specifically measuring self-esteem, anxiety, and depression. I will be looking at these areas in both populations aiming to see if a difference exists. So in this study, I compared depression, anxiety, and self-esteem in the student-athlete population to those who do not participate in varsity-level sports at Fairfield University. I administered a survey to undergraduate Fairfield University students to assess their participation in the varsity-level and intramural or club sports at the University. I also assessed self-esteem, depression, and anxiety using the Rosenberg Self-Esteem Scale (RSE), the Personal Health Questionnaire Depression Scale (PHQ-8), and the General Anxiety Disorder Scale (GAD-7), respectively. I used bivariate statistical tests to compare the various mental health scores by sports participation status.

Understanding How Instagram Influences Attitudes Towards Vaccination Among 18-24-Year-Olds

Julianna Sinotte

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Egan School of Nursing & Health Studies

Booth: 60

Abstract:

In 2019, the World Health Organization deemed vaccine hesitancy as a top ten global health threat. Four years later, this remains a pertinent issue in which individuals delay or refuse vaccination as it is viewed as an unsafe and unnecessary public health prevention effort. Hesitancy stems from a long history of complex social, political, cultural, economic, and religious influences, as well as discrepancies in health literacy. Vaccine hesitancy in the United States resurfaced in new waves amidst the COVID-19 pandemic. In a world of growing technology, vaccine hesitancy has been closely linked with the increasing role of the Internet and its associated communication tools, with health-related social media initiatives on the rise. Social media has the power to influence perceptions and increase preparedness for health-related emergencies, while helping individuals frame a concrete understanding of complex diseases. There is a lack of research on the impact of Instagram posts on attitudes towards vaccination, especially among young social media users. The primary purpose of this research was to evaluate how Instagram users ranging from 18 to 24 years of age perceive different vaccine-related Instagram content. To assess this, I administered an online Qualtrics survey to individuals in the target age range. Participants were randomly assigned into two groups, each with its own example of an Instagram post—one featuring a celebrity and posted by a pharmaceutical company and one posted by Fairfield University—and answered questions about their perception of various features of the post they saw. I compared two primary outcomes by group: general attitude toward the post and perceived effect of the post on willingness to get vaccinated.

An Assessment of New York State Medicaid Repairs of Wheeled Mobility Equipment for Individuals with Disabilities

Ann Dailey

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College of Arts & Sciences

Booth: 61

Abstract:

Medicare and Medicaid are two pathways for elderly, disabled, or low-income individuals to obtain medical insurance. In New York State, Medicaid provides disabled enrollees with one medically necessary wheelchair. These wheelchairs are serviced and repaired by either National Seating and Mobility (NSM) or Numotion. The repair process is subject to frequent and persistent delays due to scheduling difficulties, staffing shortages, and inventory delays. This literature review aims to (1) Address who is covered under Medicare and Medicaid and what the qualifications for coverage are, (2) Discuss New York State Medicaid and the requirements for coverage regarding durable medical equipment, (3) Discuss the timeliness, affordability, and access to wheelchair repairs under New York State Medicaid, and (4) Offer recommendations to law makers and regulatory agencies for changes to improve the timeliness, affordability, and access to wheelchair repairs under Medicaid.

Silent Echoes of Tragedy – Unraveling the Epigenetic Legacy of Genocidal Rape in Rwanda's Offspring

Avery Fenton

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College of Arts & Sciences

Booth: 62

Abstract:

Rwanda's tragic history of genocide echoes through generations, revealing a narrative of resilience and struggle. This study explores the intersection of biology and trauma, uncovering the epigenetic legacy of genocidal rape and its profound impact on Rwandan individuals' health. Through an examination of prenatal maternal stress (PNMS) and its manifestation in trauma and PTSD, the research illuminates the enduring effects of intergenerational trauma (ITT) on offspring. Second-generation survivors display symptoms of inherited post-traumatic stress disorder (PTSD), while maternal trauma affects fetal development, leading to long-term emotional and immune challenges. PNMS-exposed offspring face increased risk for a variety of adverse birth outcomes, highlighting the lasting impact of genocidal rape. Despite these findings, Rwandan society and its healthcare system inadequately addresses the unique needs of this population, perpetuating cycles of marginalization and compromising their overall quality of life. The study emphasizes the urgency of trauma-informed care, longitudinal studies, and policy reforms to recognize and support all individuals affected by intergenerational trauma.

The Impact and Surveillance of Concussions in College Athletes

Madalyn Kiely

Faculty Mentor: Dr. Patrick Kelley

College of Arts & Sciences

Booth: 63

Abstract:

Background: A concussion is a type of traumatic brain injury that occurs when any fall or hit to the head or body causes the brain to shake inside the skull. Concussions can lead to varying short and long term health problems and they can affect your emotional and physical wellbeing, which can also lead to problems in your daily life, such as school, relationships, and sports. The NCAA guidelines have implemented a baseline assessment and a return to play protocol after a concussion in college sports that schools should be following. This study aims to learn about the impact of concussions in college student athletes and what further protocols are needed for the prevention and surveillance of concussions in college athletics.

Methods: A survey was conducted on 50 male and female student athletes on the soccer, lacrosse, and rugby teams at Fairfield University on questions about the impact and surveillance of concussions in college sports.

Results: There were about 40% of the 50 athletes that have suffered from a concussion in the past 5 years but 100% of them said they felt that their concussion was taken seriously by the medical staff and coaches. There were a lot of similar answers to the common symptoms and interventions that come along with a concussion.

Recommendations: Establishing a plan to monitor and track head injuries is important. The NCAA should require a report on everyone who gets concussions, noting what caused them and what doctors found. Doing the baseline concussion test every year, not every other year, makes it easier to see how a person's brain changes after a concussion and allows for a comparison between pre and post-concussion. Further research and education on concussions helps the players, doctors, and coaches know the best ways to treat and manage this injury and be able to stay up to date on new information.

Redefining Informed Consent Standards: A Step to Solve Gaps in Health Literacy, Foster Trust, and Empower Patients

Emma Sweeney

Faculty Mentor: Dr. Patrick Kelley

College of Arts & Sciences

Booth: 64

Abstract:

In healthcare systems worldwide, informed consent serves as the foundation of ethical medical and surgical practices. It is the process by which patients are provided with the purpose, risks, benefits, and indications for their medical procedure. These documents are responsible for enhancing patient autonomy to procure decisions based on their medical wishes and knowledge levels. The concept of informed consent has evolved over time, reflecting changes in medical ethics, legal standards, and societal expectations. The formalization of the recognition of informed consent dates back to the Nuremberg Code in 1947 when Nazi physicians were conducting unethical and heinous medical procedures on unwilling subjects. In response, the Nuremberg trials exposed these medical experiments and established the Nuremberg Code to legalize the requirement of voluntary and informed consent of subjects in both medical and research experiments. Since then, informed consent statements have evolved not only to meet advancements in medicine but also to serve as legal protection for providers. As informed consent processes persist as a crucial element to healthcare, it is evident that existing informed consent practices are insufficient in addressing critical issues such as the lack of awareness of health literacy, the prevalence of hostile and coercive environments, and ensuring patients possess the necessary competency to make informed decisions. Patients are feeling coerced and disregarding crucial information about their procedures when environmental and time restraints provide an urgent requirement for their signature. This research project will utilize various methods to prove the need for reform in the standards of informed consent with a focus on maintaining autonomy, inclusion, and clarity with our patients. I plan to identify ambiguities and areas for improvement in the informed consent process and propose redefinitions for the standards of informed consent to increase patient satisfaction and outcomes.

"No Nos Saben Escuchar": Examining Language Access in Medical Contexts in the United States

Abigail Barth

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College of Arts & Sciences

Booth: 65

Abstract:

In the United States health care services, communication is an essential part of providing higher quality care and establishing a level of trust between health care workers and their clients. However, existing research has demonstrated that, in many cases, minority language speakers feel that providers and nurses “do not know how to listen” (Santos et al., 2022). The conversations in the health care system involve stress and discomfort as is; the lack of competent communication creates more discomfort and can create emotional distress for those receiving medical care. The lack of clear communication in the health care setting leads to procedural errors, and therefore, adverse health outcomes and financial burdens for minority language speakers. The aim of the research is to provide a categorization of the main limitations of linguistic access that minority language speakers experience in medical contexts. It is essential in the process of improving the aspect of communication in health care. In methodological terms, the study uses qualitative research sources to compare the experiences of providers and minority language speakers in their interactions within the health system. The experiences expressed in other studies by people with limited English proficiency in the health system are the most valued sources of research. The study also uses sources that explain the perspectives of cultural competence in communication.

Key words: language access, limitations, minority languages, patient experience

The Attitudes of Teachers Towards Dual Immersion Programs

Erin Breitenbach

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College of Arts & Sciences

Booth: 66

This research was also presented at the Alpha Mu Gamma 37th National Convention

Abstract:

The increase of dual immersion students in schools creates a need for intensive instruction in both Spanish and English. In a dual immersion classroom, students are taught in both English and Spanish, with the goal of maintaining the minority language. This research focuses on analyzing teachers' attitudes towards dual language classrooms. The attitudes teachers have toward these programs affect the relationships they make with their students. Many teachers' attitudes feel that there are not enough resources to accommodate students, which creates frustration because they want to adequately teach their students. It is important to ensure that students feel comfortable in these bilingual environments. Bilingual students are not a well-represented population. With a focus on dual language teachers and classrooms, the research is directed toward the institutional practices of these teachers in order to analyze the opinions and attitudes they hold. This research is conducted by the researcher in a Connecticut dual immersion program. In addition, the research includes a personal interview at a school of a first grade teacher. Since dual language teachers are a shortage area, it is important to represent and support these teachers so that their attitudes can continue to grow and remain positive. It is crucial to ensure that this field is more widely known so that teachers can be successful in their instruction.

A Sociolinguistic Approach to Ideologies and Attitudes Towards Code-Switching Practice Among Bilingual University Students

Karla Castro

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College of Arts & Sciences

Booth: 67

Abstract:

This sociolinguistic study investigates the ideologies and attitudes towards code-switching (CS) among bilingual university students. The main objective is to understand the prevailing beliefs about these linguistic expressions and their impact on code-switching usage and the formation of students' identity. Previous studies, such as Ali (2023) and Rangel, Loureiro-Rodríguez, and Moyna (2015), highlight the interaction between linguistic attitudes, code-switching, and ideological influence, providing a deep understanding of how these factors influence language choices and student identity. The research aims to explore attitudes and practices of code-switching in bilingual university students, contributing to understanding how linguistic ideologies affect their language practices and cultural identity. The research questions include the following: What are the prevailing ideologies surrounding code-switching among bilingual university students? Do students perceive CS to have benefits or disadvantages? How do these ideologies influence their language practices? How do they influence the formation of their identity? Through these research questions, we will inquire whether there is consensus in ideologies about code-switching among bilingual students or not. Additionally, we will examine whether they perceive benefits or disadvantages in their daily communication and how these ideologies influence their language choices and identity. To address these questions, a mixed-methods approach is employed, combining qualitative and quantitative methods. A questionnaire adapted from Farah Ali (2023) will be used to assess attitudes towards code-switching and participants' language preferences. The results shed light on the significant influence of linguistic ideologies on perceptions of code-switching and bilingualism. Despite the generally positive perception of code-switching among participants, expressions of disadvantages indicate the need to challenge harmful ideologies and promote a more realistic appreciation of bilingualism.

The Critical Period for Second Language Acquisition: When the Affective Filter is the Lowest

Alexandra Emanuel

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College of Arts & Sciences

Booth: 68

Abstract:

The relationship between language acquisition and age has been a relevant topic of study since the 1960s when Eric Lenneberg refined the concept of the critical period hypothesis. This theory, which suggests that there is a critical period in childhood ideal for learning a second language, has been widely accepted and applied to second language acquisition (SLA) for the past few decades. However, recent research indicates that this “critical period” does not exist beyond learning the native language (Azib, 2021). Thus, as other researchers propose, it is extenuating factors that more strongly determine the success of SLA. Since this objection is recent there are not many studies to refute or support this theory for SLA. As a consequence, the field is presently divided between linguists and studies that support or deny that there is a critical period for learning a second language. Therefore, this article analyzes factors other than age like linguistic exposure, motivation to learn, and availability of resources affect the journey towards bilingualism. To do so, it addresses inquiries like how is the field theoretically divided, was this acquisition process elective or essential, how long did it take to overcome limited proficiency, and what were some affective factors that drove or hindered the language acquisition. To establish a theoretical base, this study began with previously executed research. Next, surveys were administered to a group of first-generation immigrants of different ages and of various languages-French, Spanish, and Croatian-with two settlement destinations-the United States and Switzerland-to examine circumstantial SLA by immersion. In addition, surveys were administered among two students specializing in Spanish to test ASL in a formal setting. Following the surveys, an interview was conducted with each participant to clarify responses. This methodology examines how the theory aligns with the participants' lived experiences, and further, which side of the debate is supported by the case study evidence. The results indicate that the SLA of the bilinguals studied was strongly influenced by affective factors that coincided with age of onset. Therefore, this article clarifies how aspects other than age affect learning a language and raises awareness of the difficulties and misconceptions surrounding second language learning.

Spanglish in a Monolingual Country: Characteristics, Perceptions and Use of a Hybrid Language

Grace Magilligan

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College of Arts & Sciences

Booth: 69

Abstract:

Spanglish, understood as a hybrid language of Spanish and English in the United States, is not a new phenomenon and exists in all spaces in which Spanish is present, but does not hold the same respect as either Spanish or English. Existing investigations show that Spanglish plays a role in the formation of Latino identities in the U.S.. Furthermore, studies show that Spanglish is not a random phenomenon, it is a conscious choice by its speakers. Spanglish is an under-researched field in linguistics and misunderstood by the public as an incorrect or fake language used by Latin Americans. The purpose of this study is to compare the use, characteristics, and perceptions of Spanglish in the United States and among students in a university in Connecticut. This study analyzes the use of the dialect of Spanglish among Latinos in the U.S. including ideologies and functions of Spanglish and its use in classrooms. The questions that guide this investigation are: Why do Latinos use Spanglish and what are their opinions about its use? Also, a survey of short answer and agree or disagree questions was sent to students in the Spanish as a heritage language program in order to analyze the patterns of use of Spanglish among bilingual students at Fairfield University.

Occupational and Employment Segregation of Women in Sports Media Industry

Janelle Brown

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 70

Abstract:

This project focuses on the gender gap and gender prejudices in the sports media industry, which results in unequal opportunities and positions for everyone involved. Gender stereotypes, a lack of networking opportunities for women, and a society where men predominate are all obstacles that women face today in the sports media industry. My research shows that fighting institutional barriers, promoting diversity and equity, and creating opportunities for women to succeed are all necessary in order to address these inequities. In order to build workplaces that are more equitable and to advance gender equality, it is necessary to make changes to the system, to reform policies, and to transform cultural norms.

The Gender of Addiction: Janis Joplin, Stevie Nicks, and the Rock Music Industry

Eileen Flaherty

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College of Arts & Sciences

Booth: 71

Abstract:

Women in the rock music industry have constantly battled with being treated equally to their male counterparts. The industry, recognized for popular figures like Mick Jagger and Kurt Cobain, has consistently set standards and expectations for females in the industry to keep males on top, resulting in evident gender inequality, yet it is rarely talked about. While women in rock are more appreciated now, that would not be possible without the fights and awareness of female rock stars over several decades. Drug use and addiction, sadly, is a common problem in the rock industry, and female rock stars face harsh mistreatment for their usage of it, while men rarely do. For male rockers, it is expected; they live a lavish and eccentric lifestyle. For women, they are commonly labeled as overly emotional, and in need of saving. Because of this viewpoint, women often experimented with many drugs alongside their male counterparts, resulting in horrible addiction, and for many, death. Specifically, I talked about two legends in the industry: Janis Joplin and Stevie Nicks. Joplin and Nicks struggled to keep up with the lifestyles of rock 'n roll stars, specifically the men in the industry alongside them. To keep up or fit in with this dangerous lifestyle, these women, along with other women, often heavily abused drugs, which were glorified for those in the industry. This led to addiction, and sadly for Janis Joplin, an overdose which caused her death. This project explored how these women use drugs and how addiction is represented amongst women compared to men. I have compared these women to the expectations of a woman displayed in Betty Friedan's "The Feminine Mystique" as well as a more modern approach looking at Roxanne Gay's "Bad Feminist."

Breaking Biases: Gender and Likeability in Contemporary Television

Margaret Godfrey

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 72

Abstract:

Gender biases in popular culture continue to have a negative impact on society despite the efforts of successive feminist movements. This study evaluates today's perception of "unlikeable" male and female characters through experimental methods as well as analysis of media discourse. Gender biases and media depictions of male and female protagonists are the two prominent factors of interest in this study. Experimental methods evaluate the opinions concerning viewers' perception of unlikeable male versus female characters. Similarly, media discourse is evaluated to determine the ways in which media types, such as television, social media, and print media, demonstrate gender biases that influence society's perceptions, and consequently their affinity for male versus female unlikeable characters. The research bridges the gap in understanding the relationship between the media's portrayal of these characters and the way people perceive unlikeable male versus female characters.

Inequalities and Sexualization of Women in Film

Emma Jardin

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 73

Abstract:

Despite the rise in awareness of inequality for women in media, film companies and reporters continue to discriminate against women's representation through ageism, sexist questions, and hiring strategies. This problem has been believed to have lessened in recent years due to a more progressive mindset in media including movies centered around minorities, female directors gaining recognition, and the #MeToo movement calling out harassment and sexualization towards women from men. To see how these sexist trends have in fact not changed as much as we believe, I have gathered various data including the age range for actresses in film, the percentage of women working in front and behind the camera, and compared interviews given to female actresses opposed to those given to men. In my findings I have discovered that women are indeed passed over when they have reached a certain age while younger women, specifically women in their teens and 20s are being favored. Along with this, there is a clear gap in the amount of women being hired to work on film sets under the claims of incompetence and inability. While women are becoming the center of more media, this is also paired with a stream of sexist questions in interviews asking about their appearance over their capabilities.

Mental Healthcare and LGBTQ+ Youth: A Call to Action

Madison Lynch

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 74

Abstract:

LGBTQ+ youth disproportionately suffer from mental health conditions such as anxiety, depression, and substance use. When compared to their straight peers, LGBTQ+ youth are much more likely to experience suicidal ideation and suicidal attempts. Although LGBTQ+ youth access mental healthcare resources more frequently than their peers such resources are not working to assuage this problem. Through a literature review and analysis of the most recent work on LGBTQ+ mental health care, this paper explores the different modalities that are effective in providing care to LGBTQ+ youth. Such modalities include underlying frameworks that can be applied conjointly with types of therapies, specific clinical modalities catered to the needs of LGBTQ+ youth, and considerations of environmental factors that influence treatment outcomes. Although such interventions can be effective, there remains a dire need for evidence-based practices designed specifically for LGBTQ+ youth and their needs in order to address this crisis.

The Covid-19 Crisis: Women's Mental Health

Julia Majewski

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 75

Abstract:

Covid-19 was officially declared a pandemic on March 22, 2020. Since then, Covid has led to a global increase in anxiety and depression, as well as other psychological disorders, among everyday civilians, healthcare workers, and the loved ones of people infected with the virus. Research indicates that women's mental health is disproportionately affected, with higher rates of anxiety and depression emerging among them. This trend may be attributed to heightened fear of Covid among women. Additionally, women are exhibiting a higher prevalence of Posttraumatic Stress Symptoms (PTSS) and meeting the diagnostic criteria for Posttraumatic Stress Disorder (PTSD) at a greater rate than their male counterparts. Mothers and soon-to-be-mothers are experiencing a harder time coping with the pandemic and are experiencing less social support as well as higher prevalence of anxiety and depression. The hope is that more research is conducted on the negative impact of Covid-19 on the mental health of women. Equally pressing is the necessity for healthcare professionals to offer enhanced resources and support tailored to women's needs, given their elevated vulnerability to developing psychological disorders as a result of their experiences throughout the pandemic.

Pain and Perception: Sedative Usage Among Leisure-Class Women in Wharton and Friedan

Emma Wentland

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 76

Abstract:

The utilization of sedatives by leisure-class women in the twentieth century reflects shifting societal attitudes toward women's mental health and autonomy. Women in the early 1900s often viewed sedatives as a tool to manage and suppress emotional and psychological distress. Comparatively, the usage of sedatives by women in the 1960s combined both medical advancements of the time and societal expectations regarding women's roles and behaviors. While these medications provided relief for some women, they also brought attention to broader issues related to gender and the medicalization of women's experiences. Although many have written about women's usage of sedatives in the 1900s, few have compared the role of sedatives to the image of the 1960s happy housewife, where surprising continuities exist. This research project compares Lily Bart from Edith Wharton's "The House of Mirth" (1905) to the idea of the New Woman from Betty Friedan's "The Feminine Mystique" (1963). Despite being decades apart, both women faced societal pressures to navigate complex social environments constrained by expectations of femininity and conventional roles such as being wife and mother. Additionally, both perspectives explore the difficulty of choosing between personal desires and societal constraints. This project sheds light on the limitations imposed on women's independence during their respective eras and their coping methods.

Vices and Virtues: An Analysis of Victorian Sexuality and Gender through the Rossettis

Caleigh Hopkins

Faculty Mentor: Dr. Shannon King

College of Arts & Sciences

Booth: 77

This research was supported by the Humanities Institute

Abstract:

This project analyzes the works of the Rossetti siblings as a reflection of broader Victorian culture, more specifically of Victorian sexuality and gender norms. The works of Dante Gabriel Rossetti and Christina Rossetti can be viewed as both products of and challenges to Victorian culture and gender norms; some works are suppressed by Victorian propriety while others subvert it. Whereas Dante Gabriel more explicitly explores themes of desire and eroticism, overtly challenging the Victorian repression of sexuality, Christina's poems often delve into these themes of longing and sensuality in a more restrained and nuanced manner, revealing a clear sexual double standard. The Rossettis navigated the constraints of their time while still pushing the boundaries of acceptable artistic and poetic expression. This ultimately contributed to a reevaluation of traditional Victorian ideals and paved the way for the changing gender norms of the late 19th and early 20th centuries.

Contours of Change: A Historical and Political Exploration of Brazil, Chile, and Columbia, Unveiling Human Resource Management and Social Justice Challenges in Brazil

Matthew Bailey, Madison Boisvert, Joseph Stocchetti, Molly Sentowski, Olivia Kingston

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 78

Abstract:

This research project delves into the historical and political contexts of Brazil, Chile, and Colombia, countries characterized by deep-rooted societal complexities. Focusing on Brazil, we aim to explore the innovative intersection of Human Resource Management (HRM) impact and social justice issues within its unique landscape. This report is innovative because it dives into the historical, political, and socio-economic landscapes of Brazil, Chile, and Colombia while offering insights into the complexities of these South American nations. Each segment focuses on different aspects such as HRM impact, social justice issues, and historical contexts, giving a comprehensive understanding of the challenges and opportunities that these countries face. Also, our report adopts a comparative approach by highlighting unique characteristics and commonalities among the selected nations, which enriches the analysis and facilitates a deeper understanding of our subject matter. Our report discovers how societal issues and history have developed in these South American nations at different levels but how they share commonalities which allow them to increase in their HRM practices, especially through growth opportunities such as government retention. Social justice issues further underscore Brazil's complexities. Access to education and healthcare, income disparity, accountability within security forces, and gaps in the justice system are among the pressing concerns. By focusing on Brazil, a country unfamiliar to the research team, we seek to gain deeper insights into these issues and their interconnections. Brazil's significance lies not only in its status as the largest country in South America but also in its substantial GDP, making it a pivotal case study. Despite strides in human resource policies, Brazil continues to struggle with economic inequality, presenting challenges in recruitment, training, and employee relations. Moreover, economic downturns, governmental interventions, and educational disparities compound these challenges. This research project blends human resource management impact analysis with a comprehensive examination of social justice issues, offering a nuanced understanding of Brazil's multifaceted realities. By addressing the dynamics of HR functions within the broader context of social justice, this study attempts to shed light on avenues for improvement and reform in Brazil's societal and organizational frameworks. The team will provide recommendations for solving these social justice and human resource management challenges.

Labor Rights in South East Asia

Kate Fenner, Evan Keiser, Dominic Macedo, Kevin Meegan, Luca Picariello

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 79

Abstract:

This project looks at the violations of both labor rights and basic rights in Southeast Asia, specifically in the countries of Vietnam, Indonesia, and Malaysia. One of the main issues being discussed is how there was a sharp rise in the need for palm oil during the COVID-19 pandemic because of its use in rubber gloves and other products such as the plastic bottles used to hold hand sanitizer. Because of the need for such products and the lack of labor rights in these countries, many workers were forced to continue to work during the height of the pandemic, leading to increased sickness and death, especially in the older populations. Additionally, many of these countries have underreported the number of active COVID-19 cases because of the need to prove to the world that they are doing a better job than others at lowering the rate of transmission. Additionally, this research project integrates social justice frameworks with Human Resource Management (HRM) strategies. This research project goes beyond traditional legal and economic analyses to incorporate social justice principles, addressing the ethical imperatives behind labor rights issues. It scrutinizes the effectiveness of labor laws, the influence of international agreements, and the roles of global supply chains, employing a mixed-methods approach that includes both quantitative and qualitative data from government reports, international organizations, and stakeholders interviews. Central to the study are the precarious conditions of migrant workers, limitations on freedom of association, collective bargaining challenges, and the systemic inequalities within industries notorious for labor rights violations. By examining the impact of these issues on HR functions like recruitment, training, and employee relations, the project identifies gaps in labor law enforcement and HR practices contributing to worker exploitation. The research culminates in actionable recommendations for multinational corporations, advocating for a proactive HRM approach that aligns with international best practices and emphasizes fair treatment, protection of workers' rights, and sustainable workplace environments. These include conducting risk assessments, enhancing labor standards, fostering worker dialogue, supporting local community initiatives, and engaging in continuous monitoring and policy adaptation. By melding social justice concerns with HRM practices, this project offers an analysis that not only highlights specific challenges in labor rights within Malaysia, Vietnam, and Indonesia but also proposes pathways toward more equitable and just labor practices, contributing to the broader discourse on improving labor standards and the welfare of workers in the region.

Empowering Equality: Unveiling Gender Inequality in Northern Africa - A Case Study of Egypt, Morocco, and Sudan

Alicia Glasheen, Taylor Baron, Paul Blanco, Sydney Corbett, Melissa Schaffer

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 80

Abstract:

Our research project encompasses gender inequality in Northern African, specifically Egypt, Morocco and Sudan. We discuss the shortcomings of these countries regarding gender inequality by looking at the history, politics, education, economic and business conditions, and cultural factors following Hofstede dimension scores for each country. There have been advances in attempting to create a more equal environment, but there are still inequalities in these countries that need to be addressed, such as low literacy rates, low access to education and people with disabilities not receiving specialized education and assistance. There are restricted educational opportunities, limited employment options, wage disparities, lack of representation in leadership positions and cultural norms that prolong gender stereotypes and discrimination. Some recommendations that we have to narrow the gender inequality in these locations is to increase access to education in rural and urban areas. If education is increased, then it will level the playing field. In terms of human resource management development, African countries have come a long way and made many advances, but in Morocco, Sudan and Egypt there needs to be a push in order to reduce gender inequality.

Constraint on Women's Rights in Southwest Asia

Brooke Lennon, Dana Galloway, John Casey, Jared Baker, Monte'Eria Gree

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 81

Abstract:

This research project covers how women are controlled and restrained and the implications this social justice issue has on the HRM practices in the region of Southwest Asia. This report is about raising awareness of this social justice issue that plagues thousands of women. There is no freedom of speech for activists or any woman simply expressing herself. They face harsh traditional gender roles in both their personal and professional lives. Religion has its role in setting a precedent for how men should shape their lives and how women should shape theirs. This research project is innovative because it challenges the norms of society within this region of the world. The patriarchal norms of Southwest Asia are deeply ingrained in the culture of the region. For instance, in Saudi Arabia Islamic laws and cultural norms have enabled instances of gender discrimination to remain prevalent in the region. In this project, we are attempting to address these instances of gender discrimination and inequality by offering recommendations for these issues that will not take away from this region's cultural identity. We are attempting to combat gender inequality and discrimination without changing the fabric of their culture. The two main social justice issues are gender inequality and discrimination that keep women from advancing themselves due to deeply ingrained patriarchal values. There hasn't been a break in this precedent which has only worsened the struggle these women face. Human Resources practices significantly impact gender equality in Southwest Asia, especially in recruitment, training, and development programs and addressing the gender pay gap. HRM can also support women's empowerment through leadership programs, mentoring, and partnerships with gender equality organizations. Promoting gender equality in Southwest Asia requires a comprehensive approach involving legal reforms, education, and economic empowerment. Advocating for equal rights under the law, including marriage and property ownership, is crucial. Investing in girls' education helps address societal issues and enables them to compete equally. Economic empowerment, linked to education, opens up opportunities for women in the workforce through training, access to credit, and support for entrepreneurship.

Beyond Borders: Navigating Immigrant and Refugee Rights in Germany

Sophia Parziale, Chloe Herrmann, Allison Bridgman, Grace Gunsalus, William Capron

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 82

Abstract:

For our project we researched immigration in Europe, specifically the rights and amount of opportunity immigrants may have. When it comes to opportunity, we mainly are speaking about potential situations HR departments may face regarding immigrants in the workplace, and the resources they are able to use in order to live “normally” in these countries. We have chosen three countries to look at while conducting our research: France, Poland, and Germany. Out of these three countries, we found that Germany is most strongly affected socially and economically by the immigrants leading the country as a whole to face complex situations regarding the immigrants and the laws regarding the immigrants, which is our main topic of the research project. This topic is innovative as Germany has always been a leading country in refugee support, tracing back to World War II. However, recent changes in refugee laws reflect a dynamic response to evolving challenges. Germany is taking in more refugees than they can financially support, yet they demonstrate a bold commitment to humanitarian aid, even amid resource constraints. Their efforts however bring innovative challenges as shortages in healthcare, employment opportunities, and other vital sectors emerge, prompting innovative solutions to accommodate and integrate a growing refugee population. The immigration and refugee issue in Germany has significantly impacted human resource function within the workplace, specifically, recruitment and selection and training and development initiatives. We will dive into the challenges faced by HR professionals in navigating legal frameworks, fostering inclusivity, and leveraging diversity to enhance organizational performance among changing demographic dynamics. The immigration and asylum challenges have greatly impacted both the native and immigrant populations in Germany. We will discuss the socioeconomic effects of immigration including the challenges with providing equal wages and employment opportunities as well as access to education, healthcare and housing. The asylum system and immigration laws also greatly impact Germany’s ability to manage the immigration problem because they are bound by the legal restrictions they have created for themselves. Although Germany has been able to financially support refugees in the past, the influx of refugees more recently have caused cracks in Germany’s economic and social foundations. In this project we will further address Germany’s current immigration crisis and provide some recommendations on how Germany should address the issues that are impacting their social and economic stability.

Unveiling Healthcare Inequalities: Evaluating Social Justice Impact on HR in South Africa, Nigeria, and Kenya

Caroline Sweeny, Jacqueline Whitely, Alexandra Konstantinidis, Nicholas Brunetti, Brendan Walsh

Faculty Mentor: Dr. Mousumi Bhattacharya

Dolan School of Business

Booth: 83

Abstract:

African region. Our goal was to better understand how these issues affect Human Resource Management in the region and HRM's response to them. Research was conducted using the DiMenna-Nyselius Library's database of peer-reviewed journals and articles that explored healthcare inequalities in the region. Not only did we research social justice issues and healthcare inequalities but the region's historical, political, economic, and cultural background. We specifically focused on South Africa, Kenya, and Nigeria's history. This was a crucial aspect of our research process to better understand the impending issues at hand and how they relate back to HRM. As a group, we deciphered the most prominent issues in Sub-Saharan Africa and how they relate back to global human resources management. Another important feature of our research included the Hofstede Dimension and comparing each of the countries to the United States. We compared the countries based on six different dimensions, including power distance, individualism, motivation towards achievement and success, uncertainty avoidance, long-term orientation, and indulgence. In our research, we found that discrimination based on HIV and the inability to access healthcare resources were two impending issues affecting employees in the area. Women face copious amounts of discrimination based on their HIV status or their partner's. This makes employment and maintaining a job incredibly difficult for women in the area. There are also high mortality rates for women in Sub-Saharan Africa as there is a lack of resources for pregnant mothers. Our group also found a high multimorbidity rate and a large concern for unethical behaviors happening in the office setting. These issues were related to the benefits, compensation, paternal leave, and compliance functions of HRM. Recommendations for how organizations in the region should address these issues were made once our research was concluded.

Population Dynamics and Carbon Emissions: An Economic Exploration

Steven Burns

Faculty Mentor: Dr. R. Scott Hiller

Dolan School of Business

Booth: 84

Abstract:

This project investigates the intricate relationship between population dynamics and carbon emissions, seeking to provide insights into environmental policymaking and sustainable development. The study employs econometric methods to analyze the impact of population changes on carbon emissions. Utilizing the Stochastic Impacts by Regression on Population, Affluence, and Technology (STIRPAT) model, alongside extensions such as ridge regression, the research explores diverse factors influencing emissions, ranging from consumption patterns to demographic shifts. The project aims to contribute to a nuanced understanding of how population dynamics shape environmental outcomes, and provide more detail including variables like household size, consumption, as well as age range. Through rigorous econometric analysis, this study endeavors to shed light on the complex interplay between human demographics and environmental sustainability.

Title: The Impact of State Minimum Wage Laws on Teenage Unemployment: A 2009-2019 Econometric Regression Analysis

Nathaniel Neveu

Faculty Mentor: Dr. R. Scott Hiller

Dolan School of Business

Booth: 85

Abstract:

This study examines the relationship between state minimum wage laws and teenage unemployment rates in the 48 contiguous U.S. states over the period from 2009 to 2019. The research question delves into the effects of minimum wage increases on teenage employment prospects, utilizing a combination of basic theoretical frameworks from labor economics and regression methodologies. Through meticulous data gathering and robust regression analysis with multiple explanatory variables, this project explores the possible linkages between policy and economic outcomes. The subsequent findings reveal diverse impacts amongst explanatory variables over the specified timeframe, indicating a complex relationship between minimum wage policies and teenage unemployment. These results contribute to a deeper understanding of the consequences of minimum wage legislation on youth employment outcomes, offering potentially valuable insights for lawmakers navigating complex economic policy.

State-Specific Income Tax and Further Determination of Average Age of Retirement

Nora Shea

Faculty Mentor: Dr. R. Scott Hiller

Dolan School of Business

Booth: 86

Abstract:

Income, in terms of what is spent and what is saved, is one of the most important factors in the decision for workers to retire. Income tax, among others, is a further determinant in how much income is savable for potential retirees. This project aims to determine and discuss the impact of each state's income tax on the average retirement age for that state. Further manipulation of variables such as median income and demographic determinants, such as education and household size, allow for a more direct understanding of the association between income tax and retirement, and to quantify the size of these associations. Data for household size, median household income, and high school and college education levels per each state were gathered from the United States Census from the year 2019, specifically from the American Community Survey and the Current Population Survey. This data was chosen to offset potential disruptions to income, retirement, education, and other variables due to the COVID-19 pandemic, which may have caused irregular changes in the aforementioned variables. Due to the varying nature of tax rates and structures across the United States, the median income per state was used to determine what individual tax rate was used per state. Regression analysis was used to determine the effects of income tax, specifically, on average retirement age, where age of retirement served as a regressand and income tax per state, median income per state, education level, and household size were regressors. This analysis only focuses on one tax rate per state, where further research might provide a more comprehensive analysis of how income tax may impact average retirement age for states that have multiple tax rates or brackets for varying income levels.

Exploring the Relationship Between Unemployment and Various Forms of Criminal Activity

Cameron Simmons

Faculty Mentor: Dr. R. Scott Hiller

Dolan School of Business

Booth: 87

Abstract:

This study aims to investigate if there is a correlation between unemployment and crime, extending its analysis beyond the surface level to consider additional factors influencing unemployment as well as including an assessment of multiple types of crime. Utilizing multiple Ordinary Least Squares (OLS) regressions, the study examines the relationships between unemployment, its determinants, and three distinct categories of criminal activity: Crimes Against Persons, Crimes Against Property, and Crimes Against Humanity. Using cross-sectional data from every state in the United States from 2022, the study seeks to discern any correlations between unemployment and different types of crime, while also initiating a discussion on the potential implications of these findings. All regression analysis in this study have been done within the statistical package Stata.

Financial Indicators Of Nursing Homes and the Impact of Covid-19

Paul LoGrippe, Adam Botti, John Buckholtz, Aiden Cole

Faculty Mentor: Dr. Vishnu Vinekar

Dolan School of Business

Booth: 88

Abstract:

In a deep dive into the financial health of nursing homes during and after the COVID-19 pandemic, the use of R and RapidMiner unveiled intriguing insights. A key finding from a linear regression analysis highlighted the pandemic's profound impact, with a high R² value of 0.8696 suggesting the model captured the majority of financial fluctuations. Interestingly, despite challenges, nursing homes seemed to navigate the financial storm well, with liabilities and costs rising alongside assets, indicating a certain resilience and possibly strategic financial management during these trying times. The structuring and analysis of MSR data sheets further enriched the investigation, revealing patterns that, when combined with other datasets, offered a holistic view of the sector's dynamics. Moreover, multiple regression analyses provided a nuanced understanding of how variables like fines, Payden Days, and various ratings influenced financial outcomes and operational performance. Notably, fines and Payden Days were linked to total costs in unexpected ways, while positive correlations between survey, quality, and staffing ratings with overall ratings pointed to key areas of focus for improving performance. Cleaning the dataset in R Studio significantly refined the analysis, revealing strong indicators such as AverageOverallRating2021 and Average Total Liabilities as pivotal to understanding financial performance. This comprehensive analysis, spanning six years, not only shed light on the financial resilience of nursing homes during a global crisis but also underscored the importance of nuanced, data-driven approaches in tackling complex challenges in healthcare.

Influential Factors in Financial Performance of U.S. Nursing Homes

Kristin Scarfone, Emily Martocci, Clare Toomey, Jaclyn Faggio

Faculty Mentor: Dr. Vishnu Vinekar

Dolan School of Business

Booth: 89

Abstract:

This research project conducts an analysis of data from a comprehensive U.S. nursing home dataset for the years 2015-2021. In doing so, this project aims to evaluate the overall financial performance of nursing homes in the U.S., while identifying and determining influential factors that contribute to the financial and overall performance of these nursing homes. Further, this research seeks to describe trends in performance and analyze the impact that the COVID-19 pandemic has had on nursing homes. To do this, it was necessary to clean, aggregate, and append all of the provided datasets for each year in order to ensure the appropriate data was being used for analysis. Completed using RapidMiner, this process created one master dataset that had all of the data that could be accessed for evaluation. Regression modeling, conducted through RStudio, was used to determine the most influential factors in determining the performance of nursing homes. In this analysis, we used the daily average gross revenue as our dependent variable alongside five independent variables, all of which stemmed from different dataset sources. Through regressions, we explained 73.87% of the variance in our dependent variable, indicating the strength of these variables in determining nursing home financial performance. These findings are of importance and can be used in determining future policies for nursing homes to equip them with better care for patients. Through this research, it is possible to understand how the financial dynamics of a nursing home impact its performance on multiple levels.

Financial Analysis of Nursing Homes from 2015 to 2021: Business Analytics Capstone

Elizabeth Viggiano, Teresa Sarubbi, Allyson Quinn, Safa Abbe, Taylor Donovan

Faculty Mentor: Dr. Vishnu Vinekar

Dolan School of Business

Booth: 90

Abstract:

Our research is focused on evaluating the financial performance of nursing homes in the United States from 2015 to 2021. Our master dataset consisted of financial and statistical data, which is being used to answer our research question of evaluating the overall performance of nursing homes from the period of 2015 to 2021, by examining financial, influential and COVID factors. For financial data, we were given cost reports, which contained financial information about the nursing home, and penalties tables, which contained information about the imposed penalties on each nursing home. For statistical data, we were given provider information, which contained information about each nursing home; health deficiencies, which contains information from reported health surveys; service quality measures, which contains information from quality surveys for each nursing home; and COVID vaccine tables, which contained information about the vaccination updates for each nursing home. After examining our question and data, it became clear that our approach needed to focus on running regressions to find relationships and statistical significance, thus creating a financial impact. The COVID dataset helps evaluate the effects of COVID-19 and can help answer financial decline during the COVID years which will better structure our analysis. The COVID dataset is instrumental in assessing the impacts of COVID-19. It can provide valuable insights into potential financial downturn experienced during the pandemic years, enhancing the structure of our analysis. Through the use of RapidMiner, R, and Excel, we have found answers about the financial performance of these nursing homes during this time.

Performance of Nursing Homes in The United States (2015-2021)

Emma Wentland, Charlotte Finnerty, Arianna Muratore, Isabella Carrano

Faculty Mentor: Dr. Vishnu Vinekar

Dolan School of Business

Booth: 91

This research is affiliated with Climate, Coastal, or Marine Research

Abstract:

This project evaluates the overall financial performance of nursing homes in the United States. We began the research process by cleaning and downsizing our data in Excel to include only the most essential information. This dataset consisted of data from 2015 to 2021 for 16,413 nationwide nursing homes and 35 useful variables. This left us with 141,816 rows and 43 columns of data. To evaluate financial performance and influential factors, we used a regression analysis in RapidMiner. We found that total liabilities and staffing ratings most influenced the total income. By looking at the standardized coefficients, we determined the most influential relationships, both negative and positive. We also wanted to look at the most significant factors using p-values for a more in-depth analysis. Our results showed that total liabilities, overall rating, and fine amount were each significant (

Single Subject Research Design

Ian Hawley

Faculty Mentor: Dr. Yeddi Park

School of Education & Human Development

Booth: 92

Abstract:

This simulated research examined the effectiveness of two clinical interventions with a client experiencing Generalized Anxiety Disorder (GAD) over a 16-week period, using an intervention research method known as the Single Subject Research Design (SSRD). The study begins with documenting an initial baseline assessment period that did not include specific interventions. This period was succeeded by the introduction of the first intervention phase using cognitive behavioral therapy (CBT), and concluded with a second treatment phase, which combined two interventions at once, CBT and mindfulness-based interventions (MBI). Existing research supports the effectiveness of multiple treatments for GAD, with CBT receiving the most empirical support. A meta-analysis highlighted CBT's efficacy across a spectrum of disorders, including strong evidence for anxiety (Butler et al, 2004). Another study showed that the components of cognitive and mindfulness recovery skills, and psychoeducation resulted in superior outcomes to the control group in individuals' abilities to control emotions, increase self-esteem, and clarify thinking (Fortuna et al, 2020). These two interventions, Cognitive Behavioral Therapy (CBT) and Mindfulness-Based Interventions (MBI), were selected due to their robust empirical evidence in treating GAD. One of the benefits of utilizing SSRD lies in its superior capability to identify the root causes of behavioral changes and to ascertain the most effective and efficient treatment modalities for inducing such changes (Foster et al, 2002. p.147). In other words, SSRD has shown to have utility in determining the effectiveness of an intervention for a particular client. Conclusion: In this simulated research project, the multiple intervention approach along with consistent therapy attendance resulted in an overall positive client functioning, as indicated by a steady decrease in symptom severity on GAD-7 over the 12 weeks reaching below clinical cut-off score of 4. References Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*, 26(1), 17–31. <https://doi.org/10.1016/j.cpr.2005.07.003> Fortuna, L. R., Falgas-Bague, I., Ramos, Z., Porche, M. V., & Alegría, M. (2020). Development of a cognitive behavioral therapy with integrated mindfulness for Latinx immigrants with co-occurring disorders: Analysis of intermediary outcomes. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(8), 825–835. <https://doi.org/10.1037/tra0000949> Foster, L.H., Watson, T.S., Meeks, C., & Young, J.S. (2002). Single subject research design for school counselors: Becoming an applied researcher. *Professional School Counseling*, 6(2), 146-154.

Needs Assessment: How to Mobilize Effective Family Support for Clients in Treatment for Substance Misuse.

Joshua Shamsi

Faculty Mentor: Dr. Yeddi Park

School of Education & Human Development

Booth: 93

Abstract:

Substance misuse is a serious public health concern impacting millions of individuals, families, and communities in the United States. Existing research consistently shows strong evidence for family and caregiver involvement and support in improving health outcomes for clients in treatment for substance use issues. Conversely, extant research indicates that poor family support can be a predictor of and exacerbate substance misuse. When we think about families as complex but unified systems, it makes sense that the improved health of the entire system will benefit the individuals and vice versa. With this evidence and spirit as its basis, this assessment will explore how best to involve families in treatment. Family sessions, psychoeducation, case management, and building of life skills will be the building blocks of the program designs. Clients and their families present many different variables to consider when designing an effective and evidence-based program. This assessment aims to identify critical factors integral to designing a multifaceted program that can accommodate as many clients as possible. Research-based considerations will include the geographic proximity of the family and viability of in-person presence, financial, material, social, and spiritual resources available to the family, cultural backgrounds, and life skills of the individual and family. The assessment will also account for circumstances where a client prefers to exclude family from their recovery process due to shame, a desire for privacy, and a history of abuse. In such circumstances, efforts can still be made to provide psycho-education and dynamic workshops about supporting the recovery process widely available to those family members outside the treatment process.

SESSION 2

Faculty Mentored Independent Student Research Projects

- ◆ Sigma Xi Research Projects in Biology, Chemistry & Biochemistry, Math, Physics, and Psychological & Brain Sciences
- ◆ Independent Projects in College of Arts & Sciences, Dolan School of Business, Egan School of Nursing and Health Studies and School of Education and Human Development
- ◆ School of Engineering and Computing Independent Research Projects
- ◆ School of Engineering and Computing Senior Design Projects

Studying the Direct Trade Impact on the Specialty Coffee Industry

Zachary Ciampi, Liam Hempel

Faculty Mentor: Dr. Helena Keefe

Dolan School of Business

Booth: 1

Abstract:

In this independent research project, we partner with a direct-from-origin supplier in Medellin Colombia, Those Coffee People. Throughout this study we have looked at the impact of direct trade on the supply chain for specialty coffee. With qualitative interviews, we have been mainly reaching out and learning from roasters in the Tri-State Area. Throughout this process, we have gathered first-hand research through in-person interviews and quantitative survey responses. The goal is to understand where small and medium-sized coffee roasters are buying their coffee from (importer, distributor), how much they are buying their coffee for and whether they have or understand what direct-from-origin coffee purchasing is. The goal of our research is to understand the direct-from-origin coffee sourcing model more deeply, and study the pricing mechanisms, barriers, challenges and opportunities in place that impact farmers' livelihoods.

College Fed Challenge: Analyzing Economic and Financial Conditions to Propose a Monetary Policy Recommendation

Ariana Deljanin, Dean Tobin, Anne Tomosivitch, Bridget Keohane, Colby Zelano, Ethan Waskiel, Kathryn Capellupo

Faculty Mentor: Dr. Filippo Massari

Dolan School of Business

Booth: 2

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

The College Fed Challenge is an opportunity for undergraduate students to analyze real world economic and financial conditions in the classroom. The teams work together to formulate a monetary policy recommendation from these conditions. This challenge provides students with a deeper understanding of the Federal Open Market Committee's processes and rationale for policy recommendations. Our team analyzed several factors and indicators when deriving a recommendation: Inflation, the Global Supply Chain, Real GDP, Consumption, the Labor Market, and Financial Stability. When observing the economic data gathered until October 2023, it was hard to determine what trajectory the economy was on. The picture was one of high uncertainty, with declining but still elevated inflation, strong consumption growth, a tight labor market, and rising delinquency rates, especially in consumer credit and the commercial real estate market. We observed that the excess savings accumulated during the pandemic were a likely cause of high inflation. However, we believed that these savings were soon to run out, determining a normalization of consumption growth and a further decline in inflation. With these factors in mind and after carefully reviewing our economic analysis and forecasts, the team unanimously agreed to recommend holding interest rates steady at a target rate of $5\frac{1}{4}$ - $5\frac{1}{2}$. Furthermore, we recommended to start lowering rates in the first half of 2024, conditional on further progress on inflation reduction and decline in consumption growth.

The Use of Leading Indicators in Predicting Recessions

Ariana Deljanin

Faculty Mentor: Dr. Filippo Massari

Dolan School of Business

Booth: 3

This research is affiliated with the Honors Program Thesis

Abstract:

Leading indicators are measures that usually change before the macroeconomic variables associated with the business cycle, and serve as cues for future market disruptions. Due to the nature of these indicators, economists use them to formulate predictions concerning shifts in the market. Therefore, these indicators are useful for forecasting booms and recessions. Historically the Yield Curve, Money Supply, Purchasing Managers' Index, Quit Rate, and Initial Claims have been successful in forecasting recessions, although they have failed at times. This research illustrates the behavior of these five indicators in the United States prior to major economic events such as the Great Recession. This thesis draws comparisons between the historical performance of these indicators leading up to recessions and their current behavior to forecast whether or not the U.S. is heading towards another recession.

The Backbone of College Admissions: Identifying Key Predictors of Enrollment Yield

Caitlin Murphy

Faculty Mentor: Dr. R. Scott Hiller

Dolan School of Business

Booth: 4

Abstract:

The world of college admissions doesn't end when a student is admitted, it simply changes. As qualified students field offers of admittance to different schools, each school is competing for that student to choose their program. The percentage of students who enroll after being accepted make up the school's yield rate. In the increasingly competitive landscape of higher education, understanding the factors influencing college yield is crucial for institutions to optimize their admissions processes. Institutions need an accurate predicted yield in order to admit the correct number of students and achieve institutional goals. This project uses econometric regression analysis techniques to explore the relationship between application profile information and yield, using Fairfield University's 2018-2019 application cycle. The dataset comprises anonymized information from applicants, including geographic information, application details, student profile, application strength, and demonstrated interest.

From Pucks to Baskets: A Deep Dive into Fanbase Dynamics in Cities with Both NBA and NHL Teams

Colby Zelano

Faculty Mentor: Dr. Thomas Murray

Dolan School of Business

Booth: 5

Abstract:

The National Basketball Association (NBA) and National Hockey League (NHL) are national sports leagues that draw in millions of attendees and billions in revenue each year. As the NBA and NHL seasons span from October to April, season variability plays a role in sports culture and viewership within the two leagues. Both leagues have franchises that operate in metropolitan areas across the United States and Canada, 13 of which are located in the same major metropolitan area. The main focus of the research pertains to the way same city NBA and NHL teams act as substitutes or compliments to each other based on overall team quality. The question of concern is whether overall fanbases adapt to team quality, drawing from or contributing to a team based on their performance and other team performances in the same metropolitan area. We are comparing the NHL and NBA because both leagues consist of 82-game seasons that overlap. This allows us to thoroughly examine the way fans are attracted to or away from specific teams. We will be looking at win percentage data as our main form of determining overall team quality and using stadium attendance as our form to measure fanbase participation.

To determine whether NBA and NHL franchises in the same metropolitan area compete for or enhance each other's fanbases, we have compiled data from 2007–2018 for franchises in both sports. The data contains information on individual team attributes along with season winning percentages and overall attendance data for teams. We then built a regression model that attempts to identify the causal relationship between the success of a franchise in one league (winning percentage) and how that impacts the attendance of the franchise in the other league, where both franchises are in the same metropolitan area.

When assessing the significance of this project, we anticipate that these results will ascertain the competitiveness for fanbase participation among the NBA and NHL, as there have been debates about competitive balance and potential antitrust issues. This may lead to possible changes in how the sports industry operates in the future. Another notable result that we anticipate to garner from this study can help determine overall economic stimulation through demand and combined interest in local metropolitan NBA and NHL teams. While we see a direct attendance impact through ticket purchases, there are also indirect impacts on local businesses in the vicinity of the games. When attending a game, many viewers spend money on parking, food, memorabilia, and even gambling. This net of extra expenses associated with a game and team can have large added impacts on a city's economy.

The Effect of the Healthy Sleep Protocol on Sleep Quality in Adults with Inadequate Sleep Duration

Kathleen Morton

Faculty Mentor: Dr. Diana Mager

Egan School of Nursing & Health Studies

Booth: 6

This research was also presented at the Yale University School of Nursing Sleep & Research Symposium

This research was supported by the INSPIRE Award, and the Lawrence Family Fund

Abstract:

The purpose of this quasi-experimental study is to explore the impact of the Healthy Sleep Protocol (HSP) on sleep quality in adults with inadequate sleep duration implemented at a primary care practice. Nearly 35% of adults in the United States report sleeping less than the national recommendation of seven to nine hours per night. Sleep is a basic biological function essential for health and safety and necessitates immediate public health action from healthcare professionals. This quasi-experimental pre-test post-test study assessed the effect of the eight-week HSP on the quality of sleep using the Pittsburgh Sleep Quality Index (PSQI). Assessments were conducted for adults with inadequate sleep duration at baseline and post-intervention (eight weeks). The setting was a primary care practice. Descriptive statistics and Wilcoxon Sign-Rank tests were conducted to analyze the impact of the HSP on self-reported sleep quality. The total sample size was 11 participants. The mean pre-test PSQI global score was 7.9 (SD = 4.3) and the mean post-test PSQI global score was 4.3 (SD = 3.6), demonstrating a 46% improvement and significance difference ($z = -2.65, p < .008$) in self-reported sleep quality. Participants' mean score of actual sleeping hours per night significantly increased from 6.2 hours (N = 11, SD = 0.91) before intervention to 7.2 hours (N = 11, SD = 1.01) after intervention ($z = -2.99, p = .003$). The majority of participants (n = 10, 91%) indicated HSP had a direct impact on their sleep quality over the eight-week period. The HSP can improve self-reported sleep quality in adults with inadequate sleep duration. A free and accessible eight-week lifestyle intervention can be a useful clinical tool to improve sleep quality. Key implications include community and national-level dissemination in order for healthcare providers to improve sleep medical care in adults with inadequate sleep duration.

Breastfeeding Experiences of Women with Gestational Diabetes Mellitus: An Exploratory Study

Emily Bower

Faculty Mentor: Dr. Kimberly Doughty

Egan School of Nursing & Health Studies

Booth: 7

This research was also presented at the American Society for Nutrition 2024

This research was supported by the Elizabeth DeCamp McInerney Chair of Health Sciences

Abstract:

Objectives: Women with gestational diabetes mellitus (GDM) and their infants benefit from breastfeeding but have lower exclusive breastfeeding rates than women without GDM. The purpose of this qualitative study was to understand the perinatal experiences of women with GDM who intended to breastfeed.

Methods: Women who had GDM in their most recent pregnancy, had a full-term delivery in the United States, and were no more than 18 months postpartum were recruited to participate in a virtual focus group between November 2022 and August 2023. Focus group transcripts were coded by two independent coders and differences were reconciled with codebook consensus. Codes were then analyzed to identify major themes and sub-themes.

Results: Three major themes and 14 sub-themes emerged: 1) Challenges, including sub-themes of GDM diagnosis, doubt, physical challenges, balancing demands, lack of support, and pressure or judgment; 2) Lack of Information from Healthcare Providers, with sub-themes of separation of GDM and breastfeeding, inadequate information or support, and provider neutrality; and 3) Facilitating or Motivating Factors, including sub-themes knowledge, intention, confidence, determination, and positive support.

Conclusions: In this study, women with GDM experienced many breastfeeding challenges and felt they had received little information or support from healthcare providers. They also expressed feelings of pressure or judgment about their infant feeding choices and highlighted the value of having support systems in person or online. Finally, few participants were aware of any relationship between GDM and breastfeeding. If this experience is common among women with GDM broadly, it represents a missed opportunity to ensure that women with GDM are adequately informed and prepared for the challenges they may face (e.g., neonatal hypoglycemia).

Progress for Pediatric Palliative Care: Building a Connecticut State Coalition

Charlotte Delmonico

Faculty Mentor: Dr. Eileen O'Shea

Egan School of Nursing & Health Studies

Booth: 8

This research was also presented at the Connecticut Nurses Association Annual Convention: Nurses Leading Change; National Student Nurses' Association 72nd Annual Convention

This research was supported by the Corrigan Scholars Fund

Abstract:

Pediatric palliative care in Connecticut faces significant challenges characterized by limited awareness, restricted access to services, healthcare provider unfamiliarity, and scarce resources for families and caregivers. Research demonstrates a national lack of support for pediatric hospice and palliative care programs. It is thus essential to establish community-based palliative care services for children and families facing life-limiting illnesses. This project aims to enhance public awareness, improve community access to high-quality care, and provide robust resources for healthcare providers, families, and caregivers. The primary outcome of this project is the successful establishment of the first statewide Pediatric Palliative Coalition in Connecticut. The Logic Model served as an important framework to identify gaps in current services and develop a plan for implementation and evaluation to achieve desired outcomes. Furthermore, a collaborative partnership with the Pediatric Palliative Care Coalition (PPCC) of Pennsylvania has been established, and grant funding from the Kanarek Family Foundation has been secured to support the initiative. In forging partnerships, sharing best practices, and disseminating information, this coalition will create a sustainable infrastructure for pediatric palliative care in Connecticut.

From Interest to Inclusion: Exploring Middle School Student Perceptions in Redesigned Computer Science Curricula to Increase Representation

Catherine Bischoff

Faculty Mentor: Dr. Emily Smith

School of Education & Human Development

Booth: 9

Abstract:

The underrepresentation of women, Black, Latine, and Native American individuals in the computer science (CS) industry and STEM fields is a well-documented issue. Despite efforts to increase diversity, the numbers remain low. This study investigates the impact of redesigned and newly developed CS courses on middle school students' perceptions of CS and their intent to pursue higher-level CS classes. Conducted in a co-educational independent day school, this research employs a mixed methods design, combining qualitative and quantitative (early and post surveys) analyses. Preliminary analyses offer valuable insights into the factors influencing middle school students' decisions to enroll in computer science (CS) courses, as well as increases in students' perceptions of belongingness, usefulness, and being encouraged in CS. The status of students' confidence and interest were compared between the early and post-surveys. Furthermore, qualitative responses highlight students' interests in the different CS classes. The findings emphasize the significance of providing diverse and engaging CS activities to improve student experiences and outcomes in CS education. Educators can utilize these insights to tailor teaching approaches and improve course offerings, thereby fostering greater inclusivity and interest in CS among all students.

A Family Affair: The Impact of Internalized Diet Culture Messages from Parents to Young Adults

Maria Dates

Faculty Mentor: Dr. Carissa D'Aniello Heyda

School of Education & Human Development

Booth: 10

Abstract:

Eating disorders are extremely harmful to one's physical health and relationships. Due to the rise of eating disorders, it is important to look at how we can develop research to prevent them in a society that idolizes thin ideals and encourages extreme disordered behaviors to obtain those ideals. Social media plays a significant role in the exposure of diet culture messages. What children are exposed to on social media becomes increasingly difficult to monitor once they are adolescents and adults, therefore, it is important to focus on the family system and how these beliefs are transferred to one another. Parents play an important role in how these ideas and beliefs around diet culture are transferred to their kids. By focusing on the parental relationship, we can change the way in which they are internalizing and transferring these messages to their children. The purpose of this study is to develop a modern and timely understanding of how parental attitudes about diet culture affect the degree to which their young adult children internalize and act upon these messages. In this study I will look at TikTok posts where post creators describe how they have internalized diet culture messages from parents and how it has impacted their relationship with food, body, and exercise. By understanding how these messages are being internalized and acted upon, future research can focus on ways parents can transfer positive ideas about food, body, and exercise to prevent disordered eating or eating disorder behaviors.

Autism: Depathologizing Difference

Bliss Kern

Faculty Mentor: Dr. Dilani Perera

School of Education & Human Development

Booth: 11

Abstract:

Counselors distinguish themselves from other mental health practitioners in their preference for wellness and strength-based focuses over medical, deficit-based focuses. The mission of the American Counseling Association includes "using the profession and practice of counseling to promote respect for human dignity and diversity" (ACA, 2014). As such, it is counselors' responsibility to note and correct social justice issues that negatively impact client wellness and undermine autonomy, dignity, and self-esteem. To uphold these values, counselors and other mental health professionals may benefit from looking at Autistic clients through a diversity rather than a deficit lens in order to develop and practice more respectful and productive modes of building relationships and goals, empowering the autistic client and supporting positive self-identity, and advocating for greater social understanding and acceptance of autism in our communities. Offering a new and different lens for working with these clients is important at this moment because there is currently controversy that exists around the treatment model most commonly used by mental health professionals with autists. Autistic advocates and the self-identifying autistic community have long advocated against the use of Applied Behavior Analysis (ABA) therapy, which is still considered the go-to treatment. Historically, ABA used punitive measures in order to enforce changes in behavior to make the autistic individual appear more allistic (non-autistic) or "normal." More recent ABA work ignores undesirable behavior and focuses on positive reinforcement for allistic-like behavior. The work of recent autistic authors and researchers in the mental health field suggests that even without the use of punishment, the act of measuring autists against an allistic developmental model is ableist and increases depression, anxiety, substance use, and suicidality in autists. This project utilizes this research as the background to explain why approaching our autistic clients from a diversity informed, strength-based model honors our ethics and our clients' autonomy and empowerment.

Love While Multiply Marginalized: Couple Formation and Maintenance in Celibate LGBTQ+ Christian Couples

Timon Lee

Faculty Mentor: Dr. Carissa D'Aniello-Heyda

School of Education & Human Development

Booth: 12

Abstract:

Individuals who hold a minoritized sexual identity experience ongoing stigmatization and discrimination which negatively affect their personal health and relationships. Christian sexual minorities experience heightened levels of stress and discrimination, but their faith may also constitute a protective factor. People with both strong religious identities and marginalized sexual or gender identities face the task of reconciling seemingly oppositional identities and group memberships. When integration occurs, health outcomes significantly improve. Some Christian sexual minority individuals pursue celibacy as a relational strategy which honors both their sexual and religious identities. Some of these celibate LGBTQ+ Christians form partnered relationships with one another, but, to date, research has only considered single celibate LGBTQ+ people. In this study, I will employ Bronfenbrenner's ecological model to analyze the individual and their environment together, Meyer's minority stress model to understand the ongoing effects of oppression, and the framework of compulsory sexuality to highlight the specific oppression of non-sexual relationships. Using grounded theory methods, I will identify how members of queer Christian celibate partnerships establish, define, and communicate their relationships in their broader ecological context.

"Spanish my first language, / bachata a reminder of the power of my body"; Exploring YA Texts for Spanish-Speaking Students

Max Limric

Faculty Mentor: Dr. Bryan Crandall

College of Arts and Sciences

Booth: 13

This research was also presented at the Online Summit on the Teaching and Research of Young Adult Literature

This research was supported by the Corrigan Scholars Fund

Abstract:

Mentoring is the act of advising and training with a younger member of a community or location. Weiston-Serdan and Sanchez (2017) offer a youth-centric framework while mentoring, with a vision not to change the independence and agency of a younger person, but to focus on the asset they already possess to elevate their voice, power, and choice.

This poster highlights the academic mentorship of one Corrigan Scholar, an award given to an undergraduate student, who asked, "How might mainstream educators better serve Spanish-speaking students with YA texts? What resources and socio-historical frameworks exist to empower them as literate learners?"

Using critical friendship (James & Crandall, 2023; Silva, 2003; Schuck & Russell, 2005) and critical mentorship frameworks (Weiston-Serdan & Sanchez, 2017), the two-year project (now in year one) considers race, ethnicity, class, gender, and sexuality with an aim to locate young adult texts, children's books, ideologies, and resources, to benefit immigrant and refugee-background youth. Through weekly conversations, emails, field notes, interviews, and participatory observations common in qualitative methodologies (Bogdan & Biklen, 2008; Cresswell, 1998), preliminary results highlight literacy practices for pre-service and in-service teachers to engage and embrace newcomers as agentive readers, writers, speakers, and thinkers in a new nation.

"Clap When You Land" by Elizabeth Acevedo, "¡Ay, Mija!: My Bilingual Summer in Mexico" by Christine Suggs, "Harbor Me" by Jacqueline Woodson, "Marcus Vega Doesn't Speak Spanish" by Pablo Cartona are examined.

Use of Critical Thinking Principles in Professional Counseling: A Qualitative Study

Brendan Osler

Faculty Mentor: Dr. Jocelyn Novella

School of Education & Human Development

Booth: 14

This research was also presented at the North Atlantic Region Association for Counselor Education and Supervision

This research was supported by the INSPIRE Award and the McGuinness Fund

Abstract:

In this poster study, critical thinking in the context of counseling will be defined, analyzed, and discussed in observing the perceptions of graduate-level counselor trainees in the usefulness of critical thinking in client conceptualization and treatment during their education in diagnosis and treatment. Currently, research is sparse on utilizing critical thinking within the context of counselor competencies/education, despite accreditation standards emphasizing its importance. This research investigates the perceived usefulness based on current teaching to determine how best to not only to support to meet accreditation standards, but more importantly, to educate future counselors so clients may experience care and positive outcomes that are informed via competencies in critical thinking.

Health Disparities in Pediatric Diabetes: Family Centered Care and Parental Health

Maggie Walsh, Sarah Hernandez Putnam

Faculty Mentor: Dr. Michele Parker

School of Education & Human Development

Booth: 15

This research was also presented at the Connecticut Association for Marriage and Family Therapy

Abstract:

Background: The Centers for Disease Control and Prevention (CDC) demonstrate increasing prevalence of type 1 and type 2 diabetes among children in the U.S. Recent reports indicate an increased incidence of youth type 1 diabetics from 19.5 to 22.3 per 100,000 individuals within the past decade (Divers et al, 2020). The increase is disproportionately higher for racial/ethnic minority children. For example Hispanic and Black children demonstrated a 2.7% and 4.0% increase, respectively, compared to the 0.7% increase in non-Hispanic whites (Divers et al, 2020). Parents of children with chronic healthcare conditions such as diabetes experience adverse outcomes such as depression, caregiver burden, and family conflict (Bennet et al., 2021; Helgeson et al., 2011; Markowitz et al., 2015). As such, the growing prevalence of diabetes among children is also negatively affecting an increased number of parents' wellbeing.

The American Association of Pediatrics (2014) endorses family centered care (FCC) as an integral part of medical treatment for children. FCC is based on the assumption that children's healthcare needs are most effectively achieved in collaboration and attention to the wellbeing of the family within their cultural and social context (Coyne et al., 2018). FCC is associated with fewer unmet health care needs, increased family functioning, and reduced health care expenses (Kuhlthau et al., 2011; Kuo et al., 2011). Yet, racial/ethnic minorities and the under-insured are less likely to receive FCC (Chisholm et al., 2021; Magaña et al., 2015; Ngui & Flores, 2006), thereby limiting the positive outcomes associated with FCC. Research Questions: 1. Does FCC predict parent health among children with diabetes? 2. Is the effect of FCC predicting parent health among children with diabetes moderated by child race/ethnicity?

Methods: The current study analyzed publicly accessible data from the National Survey of Children's Health (NSCH). The NSCH is an annual cross-sectional survey conducted by the U.S. Census Bureau and sponsored by the U.S. Maternal and Child Health Bureau to assess child and family health-related data among a nationally representative sample. NSCH surveys from 2016 through 2020 were merged using the guidelines from the NSCH Guide to Multi-Year Analysis (2021).

The sample includes 475 children aged 0-17 years old with a current diabetes diagnosis (male n=247;

female n=228). The majority of participants were white, non-hispanic (77%), however, the merged datasets allowed for sufficient power to conduct a moderator analysis with racial/ethnic minority participants (n=106).

Proposed Analyses: Results from preliminary analyses will include frequencies of sample characteristics and descriptive statistics to determine normal distribution of model variables. Correlational analyses will be conducted using SPSS to determine the degree of association between model variables. Results from our primary analyses were obtained using the criteria recommended by Kenny (2018), in which the relationship between Family Centered Care and Parental Health is moderated by Child Race/Ethnicity (Figure 1).

Discussion: There is an increasing prevalence of pediatric diabetes, especially among racial/ethnic minority backgrounds in the U.S. Further, parental stress is associated with pediatric diabetes, due to expectations to manage the illness and the change in the family dynamic (Helgeson et al, 2011). Family centered care is beneficial in managing healthcare complexities, such as pediatric diabetes. However, racial/ethnic minority children receive family centered care at lower rates than their white counterparts. These findings are especially relevant in addressing racial disparities in the U.S. healthcare system.

Apollon Undergraduate EJournal

Frances Harmon, Hannah Collins, Justine Cuomo, Isabella Grey, Margaret McGinley, Christina Silvestri, Luiza Sperling, Julie White

Faculty Mentor: Dr. Marice Rose

College of Arts & Sciences

Booth: 16

This research was also presented at the Modern Language Association

Abstract:

At "Apollon," we strive to publish superior examples of undergraduate humanities research from a variety of disciplines as well as intellectual approaches. We are an undergraduate digital journal in the humanities focused on producing annual issues of excellent, peer-reviewed work from participating colleges and universities across a range of disciplines and embracing the array of intellectual approaches valued by humanistic inquiry. "Apollon" accepts essays/articles/digital projects developed from graded work written for a course or independent study related to (but not limited to): English & Foreign Languages; Literature; Art and Design History, Music History, Theater History, and Film Studies; History and Classics; Philosophy & Religion; Peace and Social Justice Studies, Women's and Gender Studies, and Regional Studies, and qualitative and theoretical work in Psychology, Sociology, and Anthropology, etc.

Policing in Connecticut: Improving Responses to Mental Health Crises

Emma Clifford

Faculty Mentor: Dr. Gayle Alberda

College of Arts & Sciences

Booth: 17

Abstract:

This research will seek to answer the question of: What is the best measure to prepare police forces to respond to situations regarding mental health crises? There are vastly different approaches to dealing with these situations. Hartford and Milford have enacted programs where they begin to work with social workers or mental health counselors on scene. These programs have been beneficial, as demonstrated through the success story in Milford. Policemen and a social worker responded to a call on a mental health crisis, and instead of the call ending with further distress, the situation was safely de-escalated, and residents were provided with possible future resources. These programs demonstrate that deescalation works, and needs to be further developed state wide. This research will compare different alternatives to handling the rise in mental health crises that police forces respond to. To test my claim, I will be using the eight fold method. This research will better aid decision making regarding alternatives to utilizing police forces for crisis intervention. While there are different alternatives present for this issue, this research will provide the best possible solution to improving police response to various crisis situations. My initial guess is that creating a government run partnership between police forces and social work or crisis management officers will be the best alternative, it will have positive impacts on police response to crises, improving these situations for both officers and those in crisis.

Painting the Cast Collection: Independent Study, Fall 2023

Megan Bacher

Faculty Mentor: Suzanne Chamlin-Richer

College of Arts & Sciences

Booth: 18

Abstract:

During my Independent Study course in the Fall 2023 with Professor Chamlin-Richer, I worked on two separate oil paintings, referencing sculptures from Fairfield University's cast collection located in Loyola Hall. Before I chose the plaster cast, which I used as a reference for each painting, I walked through the cast room and examined each sculpture; looking at the variety of casts, examining each one, focusing on how the natural light affected the color, along with its placement within the room.

Megan Bacher Man Oil on Canvas 20 x 16 inches, 2023 For my independent work, the Man was the second painting I completed in my collection. This specific sculpture caught my attention, and I sketched the piece multiple times in my sketchbook to get a general idea before I started on the canvas. I first laid a mixture of Raw Sienna and Gamsol, a solvent used to thin the oil paints, to create a base. I then sketched the sculpture with a graphite pencil, and began painting the background, then the sculpture itself. In my painting I used color theory to create the different shades and values throughout the sculpture to show how light casts shadows and brings the entire piece together. While painting the specific cast, I was able to observe my surroundings to form a mixture of Raw Sienna, Naples Yellow, Black, and White to create the unique hues and values the sculpture creates.

Megan Bacher The Dress Oil on Canvas 24 x 12 inches, 2023 For my independent work, The Dress was the final painting I completed in my collection. From the start I wanted to use this sculpture as one of my references as it stood out to me with its complexity. Before I started painting, I sketched the sculpture multiple times, so I was familiar with the way the dress flowed in preparation for painting on the canvas. I first laid a mixture of Raw Sienna and Gamsol to create a thin base. I then sketched the sculpture with a graphite pencil using a grid system, and began painting the background, then the sculpture itself working from top to bottom. For this painting I used color swatches on paper to directly match the various colors within the sculpture including, Raw Sienna, Naples Yellow, Black, and White to create the unique hues and values the cast creates. This piece in particular took the longest to complete due to its uniqueness of the dress' drapery and folds.

Actionable Alohas: Hawaiian Language Revitalization Using Multimedia Sources

Nohea Breeden

Faculty Mentor: Dr. Beth Boquet

College of Arts & Sciences

Booth: 19

This research was supported by the Humanities Institute

Abstract:

‘Ōlelo Hawai’i, also known as the Hawaiian Language, is an indigenous language that is currently in the process of being revitalized. Specifically, through the informal setting of scrolling through Instagram, many Kanaka Maoli (Native Hawaiians) are taking it upon themselves to spread the Hawaiian language and encourage daily use as much as possible. My research focuses on the ways in which social media, specifically Instagram, is being used to revitalize ‘Ōlelo Hawai’i. Through the collection of qualitative data, I am focusing on how social media accounts engage and encourage followers to incorporate ‘Ōlelo Hawai’i into their everyday lives.

The Hunger Strike and the Philosophy of Nonviolent Resistance in India & Ireland

Thomas Burke

Faculty Mentor: Dr. William Abbott

College of Arts & Sciences

Booth: 20

This research is affiliated with the Honors Program Thesis

Abstract:

This project provides a study of the manner in which the hunger strike was used as a mode of resistance by revolutionaries within both the nations of India and Ireland in order to battle the common enemy of British colonialism. Studying the interrelated hunger strikes of Terence MacSwiney and Bhagat Singh, as well as Gandhi's multiple fasts, a comparison is made between these three men and the intellectual basis of their actions as well as their motives for launching a hunger strike or fast. Most importantly, the extent to which each man upheld the philosophy of nonviolence within their political ideals, and the degree to which they incorporated the principle of nonviolence into their hunger strikes and fasts, is critically analyzed.

W.B. Yeats, Rabindranath Tagore, and Nonviolence in the Year 1916

Thomas Burke

Faculty Mentor: Dr. Marice Rose

College of Arts & Sciences

Booth: 21

This research was supported by the Humanities Institute

Abstract:

The relationship between the poets Rabindranath Tagore and W.B. Yeats has been a frequent area of interest within academic studies. Previous publications have sought to compare the two men within the context of colonial history and studies of comparative literature. However, these publications have frequently overlooked an essential aspect of the ideologies of both Tagore and Yeats, that being their commitment to nonviolence. Previous studies have not considered the extent to which these men, through both their literature and actions, truly maintained their nonviolent stance, and how their approaches to nonviolence affected their literary relationship. Through a focus on the year 1916, in which both Yeats and Tagore would publish their responses to violence within their respective nations, primarily Tagore's *The Home and the World* and Yeats' *Easter, 1916*, a comparison of their literary writings and actions within this year will reveal the extent to which both authors upheld the principle of nonviolence as well as the effect of their actions within this year on their personal relationship. Studying their later texts, Tagore's *Four Seasons* and Yeats' *Last Poems*, provides additional insight into their contrasting views as they return to the events of 1916 and the theme of nonviolence decades later. Within the year 1916, Yeats and Tagore published literary works that forced them to confront the violence erupting throughout the nationalist movements of their respective nations; where Yeats would compromise his values in *Easter 1916*, Tagore remained steadfast in his alignment with the principles of nonviolence as the two poets grew increasingly distant from one another, the difference in their ideological stances and personal estrangement being confirmed by their later publications, including Tagore's *Four Seasons* and Yeats' *New Poems* and *Last Poems*.

Independent Play Project 2024: The 39 Steps: Even More Abridged

Angelo Corsini, Nora Jacobi, Mikaela Pratt, Emily Sheridan, Dominic Chila, Alyssa Suarez, Sam Learson, Jacen Januseski, Courtney Sabogal, Oliver Merriam, Kylee Faulkner, Abby Ligas, Ryan Van Allen, Anthony Lupercio, Mia Gorcynski, Aston Dial, Katharine Kutkoski, Maday Sarmiento, Meghan Herbert

Faculty Mentor: Lynne Porter

College of Arts & Sciences

Booth: 22

This research was supported by the Jamie Hulley Arts Foundation

Abstract:

Conceived in the summer of 2023, this production of *The 39 Steps: Even More Abridged*, by Patrick Barlow, was produced as part of Theatre Fairfield's official 2023-2024 season, the organization's first Independent Play Project since the COVID pandemic. Angelo Corsini '25 and Nora Jacobi '25 spearheaded the project as the production's directors, each bringing their own style to their respective half of the play. This project was completely student led from start to finish. Nineteen students across all current undergraduate classes worked as actors, designers, stage managers, crew members, technicians, and more. With funding secured through Fairfield University's theatre program and the Jamie Hulley Arts Foundation, the cast rehearsed independently for four weeks, even giving up a portion of their winter break to do so. The company held three sold-out performances on January 26th, 27th, and 28th netting a total of \$835 in ticket sales. These proceeds were donated to Fellowship Place in New Haven CT, to support their artistic support programs for adults living with mental illness.

Constitutional Morality v. Religious Morality: Analyzing the Shift in Supreme Court Rulings on Reproductive Rights from Roe v. Wade to Dobbs v. Jackson Women's Health Organization

Lauren Flagg

Faculty Mentor: Dr. Aaron Weinstein

College of Arts & Sciences

Booth: 23

This research was supported by the Corrigan Scholars Fund

Abstract:

Since the Roe v. Wade decision in 1973, the freedom of choice in women's reproductive rights has been subjected to scrutiny by conservatives and conservative Christians, culminating in the 2022 Supreme Court decision to overturn these rights in Dobbs v. Jackson Women's Health Organization. The Roe v. Wade ruling, which declared state bans on abortion unconstitutional, affirmed women's reproductive rights as part of the right to privacy under the Fourteenth Amendment. However, the Dobbs decision marked a significant shift, allowing states to define abortion rights, effectively revoking the national right to abortion established nearly five decades earlier. The theoretical framework of this study hinges on the concept of constitutional morality, implying that Supreme Court justices should adhere to the principles and values enshrined in the U.S. Constitution, respecting fundamental rights and norms while remaining impartial and detached from popular opinion, political beliefs, and religious values. The modern Roberts court displays a transition from the use of constitutional morality to decide cases to a new form of morality, a rise in religious morality. This transition ultimately displays a shift in the prominence of religion and religious beliefs in the court. This shift is analyzed through the lens of two Trump-nominated justices, Brett Kavanaugh and Amy Coney Barrett, examining the language they use surrounding abortion during their Senate confirmation hearings and the political posturing of these hearings and opposing this with their decisions during in Dobbs hearing and their application of the Glucksberg test in determining that abortion is unprotected under the Fourteenth Amendment, positing an increase in the entanglement of religious morals in constitutional interpretation. The intertwining of religious beliefs with judicial decisions challenges the notion of constitutional morality. It highlights the impact of religious conservatism on American legal and political institutions, as well as the role of the Supreme Court as a counter-majoritarian body and the implications of originalism and living constitutionalism in the context of morality. Exploring the shift from constitutional to religious morality impacts the understanding of constitutional law, the role of the Supreme Court, and the broader implications for women's reproductive rights in the United States

Please Stand By for a Literary Canon Update: An Introduction to East Asian and Asian American Literature

Gabrielle Jacob

Faculty Mentor: Dr. Jennifer Adair

College of Arts & Sciences

Booth: 24

This research was also presented at the Connecticut Ethnic Studies Symposium

This research was supported by the Humanities Institute

Abstract:

The impact of the humanities is not only worth exploring but also worth expanding. For the majority of my life, I have been exposed to many great English and American writers, ranging from William Shakespeare to Mark Twain, and it would be inaccurate to claim that these writers did not contribute to my love of literature. However, I feel it is important to not only include but also expand on those writers we collectively refer to as great. Over the years, I have noticed that the primary focal point of literature has been restricted to male authors of European or Western descent. Given this observation, it has always been an interest of mine to diversify the literary field. As a female minority, the lack of diversity in the reading curriculum has always posed a drawback to me, and I desire to address the lack of diversity by taking an integrative approach to literature. Reading literature is more than a form of escapism; it is an intellectual tool that possesses the power of broadening one's horizons. For my project, I have researched contemporary East Asian and Asian American authors and designed a college-level course dedicated to diversifying the literary canon by including East Asian and Asian American authors. It is my hope with this course to demonstrate to others the importance of East Asian and Asian American literature and the impact they have had on society.

From Religion to Reason: How Voltaire, Diderot, and d'Holbach Influenced the French Public's Perception of Christianity during the French Revolution

Brianna McAleer

Faculty Mentor: Dr. Patricia Behre

College of Arts & Sciences

Booth: 25

Abstract:

On December 25, 800 C.E., Charlemagne was crowned Holy Roman Emperor by Pope Leo III. Charlemagne's coronation solidified the authority of the papacy and the Catholic Church over the future nations of Europe for centuries to come. As the years progressed, the Catholic faith was what legitimized the rule of kings and queens across Western Europe and drove the power of the Catholic Church in French society. But by the turn of the 18th century, the dawn of a new era emerged, and most clearly in France. It was an era associated with both the diffusion of Enlightenment ideas and the intense fervor of the French Revolution. As a result of the French Enlightenment, the ideas of religious skeptics like Voltaire, Denis Diderot, and the Baron d'Holbach circulated amongst the French populace, bringing about a new resistance to traditional Christianity. In my research paper, I examine how the diffusion of Voltaire, Diderot, and d'Holbach's skeptical religious thought influenced French society's perception of Christianity during the French Revolution. My consultation of primary sources written by these three important philosophers, along with the addition of secondary sources written by historians, reveal how religious skepticism transformed essential facets of Catholic French life, in the minds of many French people, into outgrown structures of the past. The diffusion of Voltaire, Diderot, and d'Holbach's skeptical religious thought influenced French society's perception of Christianity leading to concrete actions during the French Revolution -- undermining the French monarchy's divine right to rule; effecting the political deconstruction of the Catholic Church's authority; and fostering the anti-clericalism exhibited during the September Massacres and the Reign of Terror.

From Tragedy to Advocacy: The Effects of Polarization on Civic Participation Revealed Through the Journey of Sandy Hook Organizations

Gabrielle Norko

Faculty Mentor: Dr. Gwendoline Alphonso

College of Arts & Sciences

Booth: 26

This research was also presented at the Northeastern Political Science Association Annual 2023 Conference in Boston, MA

This research was supported by the INSPIRE Award, the Mancini Family Fund, and the Hardiman Scholars Fund

Abstract:

The modern political era in the United States is filled with unprecedented challenges, in particular, an exponential increase in the frequency of mass shootings and gun violence since the late twentieth century. The 2012 Sandy Hook tragedy marked a critical juncture in the United States' response to gun violence. In the aftermath of the Sandy Hook massacre, advocates for gun control formed networks to spread awareness about gun violence and the need for gun regulation. The battle for advocacy led Sandy Hook representatives to demand change through two primary paths, one being through the pursuit of legislative change and the second being through the formation of social organizations to enact social change. These avenues, however, have emerged into one as their voices have become a worldwide sensation. To assess the extent of change enacted by Sandy Hook, this project focuses on answering the essential research questions: Are Sandy Hook organizations attempting to create a political identity? If so, what kinds of political identities were created by these movements? How are Sandy Hook organization's identities similar or different from the creation and expression of a gun-centric political identity by the NRA and gun rights movements? How can the case study of Sandy Hook help us understand the changing landscape, if at all, of political organizations in effecting political change today? How can we understand the phenomenon of enhanced political participation of groups amidst the rising polarization and diminution of social capital and civic engagement? By answering these questions, this paper uses the Sandy Hook tragedy as a case study to examine the effects of polarization on civic participation, political efficacy, and the development of social movements. The research is guided by the journey of advocates from Sandy Hook, who have been building social organizations since 2013. Specific organizations looked at include Sandy Hook Promise, Newtown Action Alliance, Sandy Hook School Foundation, Jesse Lewis Choose Love Movement, Bens Lighthouse Fund, and the Catherine Violet Hubbard Foundation. First-hand accounts of Sandy Hook representatives in the form of interviews are included in the research for this paper. Their lived experiences are connected to the literature on social movements and political efficacy in our age of political polarization. The summation of this paper ultimately sheds light on the work of Sandy Hook advocacy groups and provides insight into the motivations that inspire collective action among citizens.

Head, Shoulders, Knees, Toes

Payton Rahn

Faculty Mentor: Suzanne Chamlin-Richer

College of Arts & Sciences

Booth: 28

This research was also presented at the Fairfield University Art Gallery Student Symposium

Abstract:

Throughout my career path, I have been keen on helping others which has led to the path of Anaplastology. What is Anaplastology? Anaplastology is a form of prosthetics that is not weight bearing but instead uses art, 3D modeling and sculpting to create a human figure that matches the wearer in a custom fit design. What makes prosthetics each a work of art, is the multiple and varied types of art used to form it from sculpture to sketching and more. These designs are unique, and each relies on the application of arts and science behind the art. Anaplastology gives me the opportunity to help individuals who are struggling with self-identity and connection to their body after battling cancer, illness, accidents, fires and more. For my certification, I must create a portfolio showcasing I understand the basic muscular structure and skeletal system of the human body along with underlying vascular systems. So, in my Studio Art Independent Study with Professor Chamlin-Richer, I have used the time to study the human body in a more in depth and diverse way that will prepare me for the workplace. I have looked at hands, skull structure, bodily functions, muscle tones and more while trying to find my own style and follow my own artistic flow. I also have been working with mediums that I will be using in the workplace. I love fine lines and detailed designs that are reminiscent of tattooed sketchy blackwork. This is meaningful to me because it will prepare me for the workplace all while allowing me to pursue my passion for creating, drawing and using my hands. For my creations- I wanted to do a play on words so my pieces are titled "Head", "Shoulders", "Knees", "Toes" which all focus on different parts of the human body. In my piece titled "Head", 20 x 16" a human skull is the main focal point where in the piece "Toes", 16 x 20" human feet are cushioned between three boar skulls. These two pieces were selected from my collection as they are my favorites and showcase a variety of different textures and skills. For my study, I wanted to test a multitude of different techniques from using a ballpoint pen to working with Monster Clay and then working with Oils. My sketchbook also contains Anaplastology related work and other things that have inspired me. Thank you for viewing my work!

A Polychromatic Color Proposal of the Head of Augustus Plaster Cast

Caitlin Roder

Faculty Mentor: Dr. Katherine Schwab

College of Arts & Sciences

Booth: 29

This research is affiliated with the Honors Program Thesis

This research was also presented at the SUNY New Paltz Undergraduate Art History Symposium (April 2024)

Abstract:

Our understanding of ancient Roman and Greek art is based on centuries of misconception. The popularized belief that classical sculptures were intended to be viewed in antiquity as in their current colorless, modern state has been disproven. Recent discoveries have blended science and art, with advanced imaging technology allowing scholars to render polychromatic color proposals of ancient statues based on Visible Induced Luminescence (VIL) and Ultraviolet Florescence (UVF) hues of paint pigment particles. This technology has provided scholars with a range of colors used by ancient Greek and Roman artists. In light of these discoveries, I created a polychromatic color proposal of a new plaster cast of the Head of Augustus under the mentorship of Dr. Katherine Schwab, Curator of the Historic Plaster Cast Collection, and Professor of Art History & Visual Culture at Fairfield University. Over the course of seven sessions, I brought the head of Augustus plaster cast to life using acrylic paints to hypothesize the original appearance intended by the artist in antiquity. When creating a polychromatic color proposal, both digital sketches and research on advanced imaging technology support the choice of pigments. These digital sketches served as the basis for my paint placement and artistic decisions which helped the plaster cast of Augustus come to life. As shown in the images below, the once colorless plaster cast has been transformed into a remarkable glimpse into antiquity.

Dear Willy: World War II Through the Eyes of One of Hollywood's Most Prominent Couples

Taylor Soyland

Faculty Mentor: Jay Rozgonyi

College of Arts & Sciences

Booth: 30

Abstract:

“Darling... Well, we finally made it. And I didn’t say ‘we’ by accident. I hope you know and realize that you have a full share in that award. It signifies to me many more things than the direction of Mrs. Miniver... not least among them the direction of the director of Mrs. Miniver, for which you wielded the megaphone a good deal of the time, and very skillfully so.”— Letter from William Wyler, March 18, 1943
“What I like is when I ride the copilot’s seat in a B25 – with cameraman in the nose, tail, and waist – directing both them and the pilot over the intercom, flying like a train over twisted railroad lines and busted bridges at 30 feet altitude and 250 miles per hour.”— Letter from William Wyler, July 25, 1944
Most people know William Wyler for directing dozens of highly regarded Hollywood films, from WUTHERING HEIGHTS and ROMAN HOLIDAY to BEN HUR and FUNNY GIRL. What they don’t know is the compelling story behind his time as a Lieutenant Colonel in World War II. Following a semester of sorting through historic correspondence and photographs pertaining to the renowned Hollywood director, senior Taylor Soyland’s interest was piqued by a series of letters and telegrams between Wyler and his wife, Margaret “Talli” Tallichet. The material, spanning more than three years in time, captures the couple’s respective experiences in the Second World War. Fascinated by both Wyler’s work as a director in the 8th Air Force’s Picture Unit and Talli’s experiences on Hollywood’s “Picture Front”—studio visits, high-profile gatherings, and award ceremonies—Taylor embarked on the creation of a documentary film to highlight the Wylers’ long-distance relationship. In collaboration with the Wyler family and Vice Provost Jay Rozgonyi, the documentary, which is currently in production, aims to immerse audiences in the fascinating period that was World War II through the unique perspective of one of the most important directors in Hollywood history.

Beyond Writing: Peer Tutors as Advocates of Linguistic Justice

Karla Castro

Faculty Mentor: Dr. Laura Gasca Jiménez

College of Arts & Sciences

Booth: 31

This research was also presented at the 2025 American Association for Applied Linguistics Conference

This research was supported by the INSPIRE Award and the Mancini Family Fund

Abstract:

The development of critical language awareness (CLA)—defined as the ability to identify “how ideologies, politics, and social hierarchies are embodied, reproduced, and naturalized through language” (Leeman and Serafini, 2016, p. 12)—is now considered an essential component of language education in the United States, particularly in the context of heritage language (HL) and mixed classrooms. Whereas a HL classroom is a language learning context where heritage (minority) language speakers focus on developing literacy skills in the minority language they grew up speaking, a mixed classroom is a language learning context where second language learners and heritage language learners study a minority language together. While language education seems to be increasingly adopting pedagogies that promote the explicit exploration of dominant language ideologies, that is, beliefs about languages and their use in a given social context, research on students' language ideologies is scarce (two exceptions are Beaudrie, Amezcua, and Loza, 2019, and Gasca Jiménez and Adrada Rafael, 2021). This ongoing study contributes to this gap by examining the attitudes and language ideologies of peer language tutors in a multilingual writing center, with the goal of making visible the connections between peer tutoring, language insecurities, and linguistic justice. For the pilot study, two semi-structured interviews were conducted with two peer language tutors. This presentation will focus on the trends identified in the interviews and outline the next steps in the study. This ongoing study contributes to a growing body of social justice-oriented pedagogy in language education.

The Future Trajectory of Spanish in the United States: Emerging Trends, Opposing Perspectives, and Educational Initiatives

Olivia Albertson

Faculty Mentor: Dr. Sergio Adrada-Rafael

College of Arts & Sciences

Booth: 32

Abstract:

In this project, I delve into the various factors contributing to the growth of Spanish usage in the United States thus far and elucidate predictions for the language's future presence based on historical data and contemporary trends. I begin by discussing data from recent decades and how the number of Spanish speakers has increased exponentially, a trend expected to continue far into the coming years. Along the same line, I also address the rise in the publication of religious literature in Spanish, indicative of a growing demand for Spanish texts and a larger Spanish-speaking population overall. I then navigate through the budding landscape of bilingual education, with a particular focus on the increase in dual immersion programs, alongside other language-learning modalities outside the formal educational sphere like innovative apps and podcasts. Contrary to prevailing misconceptions, I demonstrate how dual immersion programs do not impede English development in youth, but instead foster advanced literacy skills in both languages and overall academic success. Lastly, I discuss the nuanced perspectives of Latinxs and hate groups regarding the use and maintenance of Spanish, recognizing the profound influence of their beliefs and behaviors on its future trajectory. Through this exploration, I cast a spotlight on the intricacies of the ongoing integration of Spanish into the United States, unraveling its implications for society at large as it intertwines with American culture and daily life.

Shakespeare, the Pequot Library, and the 400th Anniversary of the First Folio

Ann Marino

Faculty Mentor: Dr. Shannon Kelley

College of Arts & Sciences

Booth: 33

This research was supported by the INSPIRE Award and the Mancini Family Fund

Abstract:

With generous support from the Mancini Family Funds through the INSPIRE Grant, I spent four weeks this past summer, from July to August 2023, curating an exhibition about Shakespeare entitled "How William Became Shakespeare: 400 Years of the First Folio" for the Pequot Library in Southport, with Dr. Shannon E. Kelley, and Cecily Dyer. My research during this time focused primarily on misogyny and Shakespeare. First, I selected key Shakespearean texts, such as "The Taming of the Shrew," "Romeo and Juliet," "King Lear," and "Macbeth." I closely analyzed these works for misogyny and researched stage adaptations of the plays and Shakespeare's personal history to get a comprehensive understanding of background and content. In consultation with the team, I drafted a thematic essay on Shakespeare and misogyny and selected images to be shown at the gallery for the 400th Anniversary of the First Folio. The second piece of my research and work involved the October 5th, 2023, exhibition launch. In preparation for launch day, I contacted Fairfield University Shakespeare Studies alumni to request their attendance on opening day for a panel, "Shakespearean Futures: A Discussion of the Future of Shakespeare Studies in Secondary School and Higher Ed." During the planning stages, I reached out to the speakers multiple times via email, pre-circulated questions, and walked them through the event by sharing an agenda, which ultimately evolved into a successful collaboration with Pulitzer Prize-winning author Stephen Greenblatt. The talk I moderated on launch day with the Fairfield alums provided nuance in a conversation about Shakespeare. Undeniably, Shakespeare is one of the greatest authors in the English language, but we cannot ignore the misogynistic and offensive aspects of his works. During this panel, I also answered questions from audience members (100 in attendance) who wanted clarification on the concepts discussed. My coordination and logistical work took much time and dedication to ensure a seamless and flawless community-engaged event. The last part of my work focused on promotion material created on Canva that the Fairfield University English department circulated on their social media pages to raise awareness in our community for the event.

Inside the Mind of a Relatively Young, Creatively Driven, God-fearing Woman: Chaotic, yet unmistakably Beautiful

Carylin Rivera

Faculty Mentor: Kathryn J. Yarrington

College of Arts & Sciences

Booth: 34

Abstract:

The two pieces presented for the symposium are part of an intricate 12-week artist book deconstruction project taking place simultaneously in the Experimental Space Gallery located on the ground floor of Loyola Hall. The exhibition at the gallery welcomes viewers into an interactive environment where they can explore work that maps the thoughts, ideas, anxieties, motivations, dreams, and reactions to the day-to-day reality of the young writer and artist Carylin Rivera. The series of books presented in the gallery, part of an immersive installation, not only has been an outlet of creative expression through meditative practice for Carylin but in showing this work she aspires to evoke strong feelings of understanding, connectedness and perhaps acceptance by viewers who take the time needed to come to understand her lived experiences. By responding to what is in front of one in the gallery, viewers might see the work as not only providing insight into the artist's perspective but through deeper reflection also may come to know themselves a little more than before.

GROWERS: Stories from a Gardening Community

Jared Alicea

Faculty Mentor: Reinaldo Gonzalez, Dr. Scott Lacy

College of Arts & Sciences

Booth: 35

This research is affiliated with the Center for Social Impact

This research was supported by the Center for Social Impact Fellowship

Abstract:

For the past five years, The Center for Social Impact has been collaborating with Green Village Initiative (GVI) and community gardeners in Bridgeport on the CARROT project. Out of this research gardeners expressed a need to further explore their stories to understand the benefits that urban gardening provides. This documentary sheds light on the motivations and perceptions of urban gardeners in Bridgeport, divulging the multifaceted importance of urban gardening initiatives. Through conversation over the summer and fall, the gardeners in Bridgeport and Green Village Initiative (GVI) staff shared their perspectives on why they are passionate about urban gardening and why it holds significance for their community. The findings reveal a deep-rooted connection between the gardeners and their surroundings. Community building emerged as a prominent theme, with many gardeners emphasizing the role of urban gardening in fostering connections among residents. Clips of community members socializing at the annual Harvest Fest event highlight this aspect. Additionally, issues of food insecurity were addressed and the gardens were able to provide fresh produce that would otherwise be unavailable. Overall, this study underscores the diverse array of motivations driving urban gardening efforts in Bridgeport. The purpose of documenting these conversation and compiling them into a short film was to connect the gardeners and the community surrounding them, and also allow for their work to be seen by those outside of the communities they reside in. By understanding the perspectives of urban gardeners, policymakers and community leaders can better support and promote these initiatives to enhance the quality of life and sustainability of urban environments.

From Community Gardens to Gardening Communities: The CARROT Project and Interactive e-Cookbook

Rishi Black, Melody Olivan Sánchez, Brendan Osler

Faculty Mentor: Reinaldo Gonzalez, Dr. Scott Lacy, Dr. Dina Franceschi, Dr. Melissa Quan

College of Arts & Sciences

Booth: 36

This research is affiliated with the Center for Social Impact

This research was supported by the INSPIRE Award, the Center for Social Impact Fellowship and the McGuinness Fund

Abstract:

Community Agriculture Research: Raising Opportunity Together (CARROT) is an economic impact study done through an ongoing five year collaboration between the non-profit Green Village Initiative (GVI) and Fairfield University's Center for Social Impact (CSI) that works to promote sustainable, urban agriculture through a mixed methods research approach. Green spaces in urban environments provide a broad payback to the neighborhoods and communities in which they reside. Adapting a framework utilized for open space and parks valuation, this project characterizes the ways that community gardening provides health and wellness to those that live in the City of Bridgeport. Community gardeners are essential to the research. Their contributions help us to understand how much work gardeners put into their plots and how much they produce. Through the 2022 and 2023 iterations of the CARROT Project, we collected information on gardener participation in community gardens. We also engaged with gardeners in weekly visits to select gardens and co-hosted monthly gatherings with the community. During these monthly gatherings, we shared back a basic analysis of the data they collected and held open discussions on how this correlated with their everyday experiences, using their inputs as the driving force for further research. In addition, we started to create an interactive e-cookbook consisting of recipes and descriptions from the gardeners that emphasize the importance of community gardens. The focus is to elevate the voices and stories of the gardeners in this study. By recognizing how urban agriculture and community go hand-in-hand, as well as having a mixed methods approach, community gardeners are able to better identify and understand how to address food insecurity in their community.

Bridgeport City Urban Mobility and Parking management Study

Matthew Mauro, Phil-Jay Whyte, Brendan Osler

Faculty Mentor: Reinaldo Gonzalez

College of Arts & Sciences

Booth: 37

This research is affiliated with the Center for Social Impact

This research was supported by the Center for Social Impact Fellowship

Abstract:

Beginning in the Summer of 2023, the City of Bridgeport's Office of Planning and Economic Development (OPED), in partnership with Fairfield University's Center for Social Impact (CSI), embarked on a two-project initiative aimed at improving urban mobility and parking management in the area. The first project involved the compilation and digitization of city-wide parking regulations. Utilizing ArcGIS Field Maps, CSI research fellows documented signage to compile data for a map which was then generated by the city's GIS department, detailing on-street parking regulations along Complete Streets and bicycle route streets. Concurrently, the second project focused on the creation of a document with recommendations for the eventual implementation of a parking permit program. Through extensive research and analysis, the fellows and the office collaborated to examine successful parking permit programs in Connecticut and neighboring states, assessing their feasibility within Bridgeport's regulatory framework. The project culminated in a comprehensive summary document outlining existing on-street parking regulations, exemplary permit programs, and relevant city and state regulations, along with a defined implementation timeline and strategies to address potential barriers. The research found that the City of Bridgeport could benefit from the implementation of a parking program and subsequent parking authority. This document will serve as an essential resource for city council members and officials to start a conversation around what purpose a parking authority would serve as Bridgeport continues its growth and development. By integrating data-driven insights with collaborative partnerships, this initiative aims to foster sustainable urban mobility, enhancing accessibility and quality of life for Bridgeport's residents and businesses.

Out of the Shadows: Neglected Humanitarian Crises

Mia Van Mater, Kathleen Kerr, Lily Joyce, Kevin Camy, Angeles Mendoza

Faculty Mentor: Julie Mughal

College of Arts & Sciences

Booth: 38

This research is affiliated with the Center for Social Impact

This research was supported by the Center for Social Impact Fellowship

Abstract:

According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), there are over 300 million people around the world in need of urgent humanitarian assistance; however, many of these severe crises do not receive the level of global awareness needed to bring them into public view. Global emergencies can go neglected for a multitude of reasons, such as: a lack of media presence, the absence of political influence, and a general disregard for the people affected. These factors have left many communities in dire need, positioning vulnerable groups in the shadow of more visible conflicts that gain media attention. Examining the number and topics of online articles, strategic media studies have revealed a significant gap between the high number of online articles written about pop culture topics as compared to extreme, imminent humanitarian crises. Through the exploration of neglected crises in countries such as Sudan, Venezuela, and Haiti, this research sheds light on the significant gaps between the dialogue surrounding neglected crises and the efforts of the international community to assist. By delving deeper into the root causes of complex, neglected emergencies, potential solutions are illuminated that amplify forgotten voices and overcome the widespread globalization of indifference.

The Healthy Savings Program

Phil-Jay Whyte, Matthew Mauro

Faculty Mentor: Dr. Anna-Maria Aksan, Dr. Mackenzie Gordon

College of Arts & Sciences

Booth: 39

This research is affiliated with the Center for Social Impact

This research was supported by the Center for Social Impact Fellowship

Abstract:

The Healthy Savings Program aimed to bridge the gap between healthy food consumption and financial insecurity. This initiative, carried out by the United Way of Coastal & Western Connecticut, set out to answer the question, “If you give people money, will they use it to purchase healthy foods, and from the data, what are the social barriers that impact healthy food consumption?” Participants of this project reside in Fairfield County, CT. They have varying economic statuses, but all experience financial barriers in purchasing healthy foods, especially fresh produce. Each participant was given a weekly \$10 benefit, where they were able to shop at participating grocery stores. Over a period of time, their behaviors were tracked by surveys. Results showed that while overall healthy consumption increased, food insecurity was not necessarily reduced. Through the use of data analysis and software, we were able to see the story behind the statistics. These tools were instrumental in our analysis because they gave a visual representation of the data, and in coding the qualitative and quantitative aspects, allowed a better understanding of the variables present. In further decoding the data, we were able to see how \$10 a week would benefit one household, but not another; how transportation and zip code impacted their frequency and ability to purchase healthy foods; and how participants nutritionally benefited from the Healthy Savings Program.

Just Monkeying Around? Exploring Group Behavior in Black Handed Spider Monkeys (*Ateles geoffroyi*)

Rishi Black, Brianna Cassese, Nora Crowley

Faculty Mentor: Dr. Ashley Byun

College of Arts & Sciences

Booth: 40

This research is affiliated with Sigma Xi, and the Center for Social Impact

This research was supported by the Biology Department

Abstract:

Black-handed spider monkeys (*Ateles geoffroyi*) are a highly endangered New World primate. The Connecticut's Beardsley Zoo currently has five individuals, one adult male (Gilly), three adult females (Janet, Bertha, and TT) and one female infant (Charlotte), born in the summer of 2023. Black-handed spider monkeys are naturally social and live in large, highly dynamic mixed groups. Not much is known about their social behavior, and whatever is documented is largely derived from monkeys observed in the wild. This makes it difficult to predict and understand the behaviors of zoo animals. Due to their endangered status, AZA institutions remain a critical haven for spider monkeys, meaning that it will be necessary to better understand their behavior in zoo habitats in order to ensure the long-term welfare of these animals. Starting in 2022, we began a long-term study on the behavior of black-handed spider monkeys to better understand their social habits and group dynamics. These observations include daily activities, mating behaviors, and potential changes in male-female and female-female relationships upon the recent arrival of the new infant.

Sip Smart: Navigating Microplastic Presence in Drinking Water on Fairfield University's Campus

Jordan Bosse

Faculty Mentor: Dr. Brian Walker

College of Arts & Sciences

Booth: 41

This research is affiliated with Sigma Xi

This research was supported by the INSPIRE Award and the Mancini Family Fund

Abstract:

Microplastics are a growing issue in aquatic ecosystems and have been found in food, air, and water. They may pose a threat to humans through water ingestion. Most recently microplastics have been found in human stool, blood, lungs, and placenta samples. To look at the more local effect of microplastics on humans, I collected water samples from our Fairfield campus to quantify and identify fibers and potential microplastics within each sample. I collected 8 sources of water including bathroom tap water, water from a dorm room kitchen, Brita filtered water, water from the Tully, water from both a working and expired water bottle filter, and water from the Biology and Physics breakroom water dispenser. After collection, we vacuum-filtered each sample and photographed each filter under the dissecting microscope. The AIM-9000, an FT-IR spectrophotometric microscope, was used to determine the identity of each fiber collected. We identified the fibers found in each source and concluded that of the 146 fibers found, 59 of them (40%) were microplastics of either Polyethylene, Polypropylene, polyvinylalcohol, Nylon, or PET. We found that the Biology breakroom water dispenser had the greatest amount of microplastics totaling 15, with the Tully Dining Commons water being second with 11 microplastics. The most abundant color of microplastics was found to be black, with 46% of the total microplastics being black. Moving forward we hope to use these results to influence the alteration of filtration methods around our campus to limit ingestion of microplastics from our water sources.

Exploring dynactin's role in sperm production and motility in the nematode worm *C. elegans*

Caitlin Fanella, Kaitlyn Santos, Serena Koshy, Sydney Youd

Faculty Mentor: Dr. Anita Fernandez

College of Arts & Sciences

Booth: 42

This research is affiliated with Sigma Xi

Abstract:

Intracellular transport involves the activity of motor proteins that traverse cytoskeletal cables. Kinesin and dynein are two motors that are required for the transport of materials along microtubules. Dynein delivers materials toward the minus end of the microtubules and kinesin moves matter toward the plus ends. Regulation of these motors is key to the proper distribution of materials within animal cells. Dynactin is a conserved multi-protein complex that regulates the activity of both dynein and kinesin. In the nematode worm *C. elegans*, the *dnc-1* gene encodes the largest subunit of dynactin. We have been studying a temperature-sensitive *dnc-1* mutant and have found that at 26 °C, hermaphrodites have a low brood size. *C. elegans* hermaphrodites produce both sperm and oocytes. Sperm are produced in late adolescence and they become stored in an organ called the spermatheca. At adulthood, oocytes are ovulated one-by one into the spermatheca to be fertilized, and then each zygote is moved into the uterus for embryonic development before being laid. Sperm are often swept into the uterus during these movements; In the wild type they crawl back to the spermatheca in order to participate in fertilization. *dnc-1* mutants lay fewer eggs than wild-type animals and also lay unfertilized oocytes, consistent with a defect in fertilization. Reciprocal crosses and sperm competition tests have suggested that this reduced fertility is caused at least in part by defects to sperm. To determine if *dnc-1* mutant animals produce fewer sperm than the wild type, we are counting the number of sperm in DAPI-stained young hermaphrodites. Next we will count the number of sperm remaining at various points during adulthood in order to determine if *dnc-1* mutants exhaust their sperm supply sooner than their wild-type counterparts. Such a finding could indicate that the *dnc-1* mutant sperm have defects in motility. These experiments will show whether defects to dynactin affect sperm production, sperm motility, or both.

Brook Trout Thermo-Tantrums

Elia Haghbin, Lilley Barry

Faculty Mentor: Dr. Ashley Byun

College of Arts & Sciences

Booth: 43

This research is affiliated with Sigma Xi and the Center for Social Impact

This research was also presented at the Association of Zoos & Aquariums 2024 Annual Conference, Calgary Canada

This research was supported by the Biology Department

Abstract:

Brook trout (*Salvelinus fontinalis*) are cold-adapted freshwater fish that have been largely extirpated from their native habitats in the Eastern United States. Various conservation efforts are currently underway to restore brook trout to their historic range. Given their preference for cold and shallow water, higher temperatures may provoke aggressive behaviors in brook trout with higher territorial defense, resource competition, active hunting, and intraspecific conflict. While monitoring water quality and organism behaviors, the Connecticut Beardsley Zoo staff noticed higher levels of intraspecific aggression and cannibalism in potentially warmer areas of the tank. This study tests the hypothesis that higher water temperatures provoke aggression by observing six distinct behaviors: chasing, passive nipping, charged nipping, lateral threat display, incomplete aggression, and reciprocal circling. Despite chiller temperatures of 12-14°C, there were consistent temperature gradients across the tank of nearly 1°C and evidence that suggested that these small temperature changes significantly impacted aggression. Even a 0.2°C increase in temperature was associated with a more than two-fold increase in aggressive behaviors. Given the effect of global climate change on the temperature of freshwater streams and rivers, the potential impact of temperature differences on trout behavior has important implications for conservation efforts.

An Examination of the Differential Effects of Oleuropein in Human Breast Cancer Cells and Normal Cells

Eliza Hogan

Faculty Mentor: Dr. Shelley Phelan

College of Arts & Sciences

Booth: 44

This research is affiliated with Sigma Xi

This research was supported by the Biology Department

Abstract:

Oleuropein is a polyphenolic compound found in the leaves, fruit, and oil of green olives. Oleuropein has been shown to reduce breast cancer cell proliferation and cause apoptosis (cell death). We and others have shown that normal human breast cells (MCF-10A) are more resistant to oleuropein-induced toxicity, whereas human breast cancer cells (MCF-7) are sensitive to cytotoxicity when treated with oleuropein. BRCA1 and ZBRK1 are tumor suppressors that form a complex using transcriptional repression and DNA repair. When this complex is inhibited, the proliferation of breast cancer occurs. MCF-10A and MCF-7 cells were treated with EtOH, 50 ug/mL, and 200 ug/mL oleuropein. After 48 hours, the samples were used to perform RT-PCR to determine the gene expression of BRCA1 and ZBRK1. The MCF-7 results suggest that there was no change for ZBRK1, but there was a slight decrease in BRCA1 expression for the oleuropein treated cells. The MCF-10A data showed a significant upregulation of ZBRK1 and a general downward trend of BRCA1 for the oleuropein treated cells. We then sought to measure various cellular changes in MCF-7 and MCF-10A treated with oleuropein. After 48 hours of treatment, the cells were assessed for cytoskeletal reorganization (immunofluorescence staining of actin), apoptosis (FITC Annexin V), and mitochondrial superoxide production (MitoSOX Red). The mitochondrial superoxide was quantified by fluorescence intensity. There is a significant induction of superoxide in the treated MCF-7 cells and no induction was observed in the MCF-10A cells. Cytoskeletal changes were observed in the MCF-10A line, but the MCF-7 data is unclear. Finally, the Annexin V assays showed no clear trend for either cell line. In summary, the data indicates that oleuropein increases the expression of ZBRK1 and decreases the expression of BRCA1 in the MCF-10A cells. Oleuropein significantly increased the induction of superoxide in MCF-7 cells and had no effect on MCF-10A cells. More work should be done to understand the effect of oleuropein on apoptosis and cytoskeletal changes in both lines.

A Comparative Study of the Effects of Oleuropein on Cellular “Stress” in Breast Cancer Cells and Normal Breast Epithelial Cells

Bronwyn Kelly, William Spak

Faculty Mentor: Dr. Shelley Phelan

College of Arts & Sciences

Booth: 45

This research is affiliated with Sigma Xi

This research was supported by the Biology Department

Abstract:

Cancer is a disease of uncontrolled cell division which is all too prevalent, impacting millions of patients each year. Improved treatment is a key component in decreasing breast cancer mortality, and some natural compounds have been shown to elicit anti-cancer effects. One of the most abundant polyphenols in the olive plant is Oleuropein (Ole), a phenolic, glycosylated seco-iridoid that is a derivative of elenolic acid. In previous research, Oleuropein has been shown to affect cancerous and noncancerous cells in vitro in different ways. In the MDA-MB-231 breast cancer cell line, treatment with Oleuropein has been shown to decrease the nuclear factor- κ B (NF- κ B) pathway, which is involved in regulating the cellular response to stressful stimuli. Separately, in MCF-7 breast cancer cells, Oleuropein has been shown to increase levels of reactive oxygen species (ROS), and no data has been found which illustrates the effects of Oleuropein on the ROS levels of noncancerous cells. In this study, the impact of treatment with Oleuropein was examined in MCF-7 (cancerous) and MCF-10A (noncancerous) breast epithelial cells. Nuclear NF- κ B protein levels and ROS levels in lysates of both cell lines were measured to determine cellular response to treatment with 50 μ g/ml (low) and 200 μ g/ml (high) of Oleuropein. It was determined that in MCF-7 cells, a high dosage of Oleuropein is correlated with a significant increase in cellular ROS and levels of activated NF- κ B. In contrast, the MCF-10A cells showed no increase in ROS levels in response to oleuropein, and we are currently investigating NF- κ B levels in these cells. The data presently indicates that Oleuropein treatment at high dosage produced effects correlated with cellular stress in the cancerous the MCF-7 cells. Conversely, the MCF-10A cells were not significantly impacted. The differential response of cancerous and noncancerous cells to treatment with Oleuropein is promising for further research of this natural compound as a potential method of cancer treatment.

Cat Calling: A Real Time Indicator of Estrus?

Emma King, Marlee Dubin, Maxwell Cozzini, Giovanna Kalin

Faculty Mentor: Dr. Ashley Byun

College of Arts & Sciences

Booth: 46

This research is affiliated with Sigma Xi and the Center for Social Impact

This research was also presented at the Association of Zoos and Aquariums 2024 Conference

This research was supported by the INSPIRE Award, the Science Institute, the Frederickson Family Innovation Lab Grant, the Biology Department, and the Mancini Family Fund

Abstract:

Amur Leopards (*Panthera pardus orientalis*) are a subspecies native to southeastern Russia and northern China. With less than 80 individuals in the wild, the Amur leopard is the most critically endangered cat on earth. To prevent their extinction, Amur Leopards are part of the Species Survival Program, a global consortium with the goal of increasing the population size of endangered animals through managed zoo breeding. Having information about their reproductive physiology such as estrus cycles is crucial for guiding breeding and conservation management. Currently, the most common way to monitor estrus cycles in felids is through fecal hormone analysis. While these may be useful for retrospective assessments, their value in real-time detection is limited. Unfortunately, there are no methods for objectively determining whether female Amur leopards are sexually receptive in real-time. Past observations suggest that some felids may increase the occurrence of their vocalizations during estrus. To assess whether vocalization is a valid indicator of estrus and a way to determine estrus in real-time, we examined the vocalization behavior of Amur Leopards at the Connecticut's Beardsley Zoo. We placed two continuous audio recorders into their habitat to collect 24/7 recordings from January 2023 to April 2024. We documented call occurrence in over 5000 recorded hours and compared it to the female's estradiol fecal profile. We found significant elevations in call occurrence (Z score ≥ 2 , $p < 0.05$). This supports the idea that calls may be used to estimate sexual receptivity in real time. We hope to expand this study to Amur Leopards in other AZA institutions.

An RNAi screen for novel regulators of the microtubule motor dynein in the nematode worm *Caenorhabditis elegans*

Serena Koshy, Caitlin Fanella, Kaitlyn Santos, Allie Fischer, Leslie Abbott, Allison Carignan, Julia Courtney

Faculty Mentor: Dr. Anita Fernandez

College of Arts & Sciences

Booth: 47

This research is affiliated with Sigma Xi

Abstract:

Proper cellular function requires the regulated transport of materials between different regions of the cell. Molecular motors are multi-component machines responsible for this intracellular transport. Dynein is an important microtubule motor that walks toward the minus end along microtubule tracks. This activity is necessary for the vesicle and organelle transport, chromosome segregation, and the movement and positioning of nuclei. Dynein is the major minus-end-directed microtubule motor in animals, and its various functions are crucial. Thus the regulation of dynein activity is essential to the proper function of animal cells. In our lab we use the nematode worm *Caenorhabditis elegans* to study gene function and to understand how genes can work together to influence fertility. In previous work we have characterized a double mutant that serves as a useful tool to identify novel regulators of dynein. A temperature-sensitive mutation that affects dynein, called *dhc-1*, causes embryonic lethality at 26 °C but does not dramatically reduce brood size. However, when a second gene, *mel-28*, is mutated at the same time, the *dhc-1; mel-28* double mutants produce a tiny brood size. The *mel-28* gene encodes a nuclear pore component required for embryonic development, but it was not previously thought to be involved in fertility or dynein motor activity. This shows that genes can have unexpected functions that are revealed only when tested in specific contexts. To identify other unexpected effectors of dynein function, we have been doing an unbiased RNA interference (RNAi) screen to systematically test each gene on chromosome I for its impact on fertility in *dhc-1; mel-28* double mutants. RNAi is a method whereby double-stranded RNA targeting a specific gene is introduced to cells, resulting in destruction of that target gene's mRNA. This is an efficient way to disrupt gene function, and there is a publicly-available library of RNAi clones available for testing each gene in *C. elegans* one-by-one. We have been using this library to identify modifiers of the low-fertility *dhc-1; mel-28* double mutant phenotype. So far we have screened about 1800 clones, representing over half the genes on Chromosome I. We identified some genes that exacerbate the low fertility phenotype in the *dhc-1; mel-28* mutants and others that partially rescue the low brood size phenotype. For example, RNAi disruption of *gsa-1*, a gene that encodes a component of G-protein signaling, causes sterility in *dhc-1; mel-28* mutant animals. This could mean that *gsa-1* acts in collaboration with *dhc-1* and *mel-28* to promote fertility. As most genes in *C. elegans* are also conserved in humans, these studies could reveal novel regulators of dynein motor activity that have consequences for human health.

Volunteer lake monitoring reveals contrasting effects of invasive species and river inflow on water clarity

Emma Kramer

Faculty Mentor: Dr. Jennifer Klug

College of Arts & Sciences

Booth: 48

This research is affiliated with Sigma Xi

Abstract:

Freshwater lakes are an extremely important part of our global ecosystem. However, their water quality is imperiled by a number of factors, including climate change, eutrophication, and the presence of invasive species. Therefore, it is of utmost importance to track changes in lake water quality, and one way of accomplishing this is through volunteer monitoring. In this study, we use data collected by citizen scientists in Lake Lillinonah, CT to look for long-term trends in water quality over time during the summer months (July and August, 2011-2022) and identify the drivers of this change. We found that Secchi depth, a metric of water clarity, was significantly increasing over time while the presence of invasive species *Dreissena polymorpha* (Zebra mussels) and *Myriophyllum spicatum* (Eurasian milfoil) was also significantly increasing. Interestingly, using multiple regression analyses, we discovered that while increases in the presence of invasive species are associated with an increase in water clarity, increases in river inflow are associated with a decrease in water clarity. These results present an interesting contrast of how two factors that are generally considered to negatively affect lake health, invasive species growth and excessive river inflow, show opposite effects on water clarity. The findings of this study provide important information for future lake management efforts and emphasize the success of volunteer water quality monitoring programs in providing meaningful contributions to scientific research.

The Plastic Plight of Patagonia's Penguins: Examining Microplastics in Wild Magellanic Penguins

Jada Ormsbee

Faculty Mentor: Dr. Brian Walker

College of Arts & Sciences

Booth: 49

This research is affiliated with Sigma Xi

This research was also presented at the 11th International Penguin Congress

This research was supported by the INSPIRE Award, the Science Institute, the Ross Summer Research Grant, and the Mancini Family Fund

Abstract:

Microplastics (MPs) have become of recent interest as they are increasing in concentration in our environment. Concerns of MPs as vectors for chemical and biological toxins, as well as the increasing risk of bioaccumulation, makes understanding the prevalence and composition of these particles a top priority in the research field. As researchers are discovering these fibers all across Earth's ecosystems, penguin biologists have become interested in their presence in various penguin species. Few studies have examined MP presence and their effects on penguins, but they are known to be present in the few species studied. This project is part of a larger study examining MPs in both wild and captive penguin populations. Fecal samples were initially collected from wild adult and chick Magellanic penguins in Punta Tombo, Argentina in December 2021. In December 2023, additional fecal samples were collected from wild adult and chick Magellanic penguins at Punta Tombo, San Lorenzo, and Pedral colonies in Argentina. Following a digestion-density separation-filtration protocol, the MPs were isolated onto glass microfiber filters and visualized using a stereomicroscope. All fibers, whether they were MPs or not, were quantified based on their color, size, and identification. Preliminary results from the 2021 data have shown evidence of MPs in both chick and adult samples, with upwards of 35% of fibers identified as MPs. The 2023 data will be compared to the 2021 data, allowing us to not only compare results between wild chicks and adults, but also between three separate colony locations in Argentina.

Tweet Tunes and Tech: Investigating the Effects of Music and iPad Play on Avian Behavior

Iliana Parikos, Brenda Santos, Jared Hultstrom

Faculty Mentor: Dr. Ashley Byun

College of Arts & Sciences

Booth: 50

This research is affiliated with Sigma Xi

Abstract:

For birds in human care, enrichment is key for their behavioral, social, emotional, and physical wellbeing. The lack of or inappropriate use of enrichment, can result in negative behaviors such as feathers plucking and aggressiveness. From January to April 2023, we created and assessed new enrichment strategies for the Blue and Gold Macaw and African Grey Parrot both currently housed at the Connecticut's Beardsley Zoo. We focused on two primary enrichment strategies, auditory and visual engagement. For auditory enrichment, we analyzed the effects of four different music genres: Rock, Classical, EDM, and Nature sounds, on the behavior of these birds. To examine the effectiveness of visual engagement, we played different types of videos including cartoons, bird videos, children's videos, and games. We hope to identify enrichment strategies that promote engagement and minimize negative behavior often observed in birds housed in zoos and similar institutions.

Investigation Of Punicic Acid-Induced Cytotoxicity and Entry Mechanism In Human Breast Cancer Cells vs. Normal Cells

Braden Quitmeyer, Chiemelie Emelife

Faculty Mentor: Dr. Shelley Phelan

College of Arts & Sciences

Booth: 51

This research is affiliated with Sigma Xi

This research was also presented at the American Association for Cancer Research

Abstract:

Punicic Acid is an omega-5 polyunsaturated fatty acid found in abundance within pomegranate fruit seeds. It has been demonstrated to have protective effects against various diseases, including cancer. While there is evidence of its anti-proliferative effects in human breast cancer cells, the mechanism by which the chemical induces its effects remains unknown. In order to better understand its anticancer properties, we examined the effect of punicic acid in human MCF-7 breast cancer cells as well as the MCF-10A noncancerous breast epithelial cell line. We performed dosage experiments at 2, 10 and 50 ug/ml punicic acid concentrations in both cell lines and measured effects on viable cell density (by MTS assay) and cytotoxicity (by LDH release assay) after 72 hours of treatment. In MCF-7 cells, Punicic Acid was found to induce higher rates of cell death as the concentration increased. On average, there was no effect of 2 ug/ml treatment, a small increase in cytotoxicity at 10 ug/ml, and a major increase in cytotoxicity with the 50 ug/ml treatment. The effect was more substantial in the MCF-10A breast cell line, with higher toxicity found at all concentrations. We further examined the role of particular signal transduction pathways (PKC, NF-kB and p38) on punicic acid-induced toxicity in both lines using. We treated cells with chemical inhibitors of each pathway, followed by treatment with 2ug/ml punicic acid for 72 hours. We found no effect of any of the inhibitors in the MCF-7 line. In contrast, in the MCF-10A cells we found a slight increase in cytotoxicity with p38 inhibition, and a slight decrease in cytotoxicity with NF-kB inhibition. Altogether, our research shows that punicic acid is differentially cytotoxic to both the cancer and normal cell lines, and we reveal possible signal transduction pathways involved in this cytotoxicity.

Increased river inflow from Housatonic River to Lake Lillinonah driven by changing climate patterns

Emeline Stewart

Faculty Mentor: Dr. Jennifer Klug

College of Arts & Sciences

Booth: 52

This research is affiliated with Sigma Xi

Abstract:

Freshwater lake ecosystems are being altered by climate change globally. Lakes can be indicators of the impact of climate change in their region, and they provide many ecosystem services. Lake Lillinonah is a reservoir in Western Connecticut on the Housatonic River that is used for recreation and hydroelectric power generation. The lake suffers from algal blooms in the summer that reduce recreation quality and river inflow can impact water quality. For these reasons we used data from a gauging station on the Housatonic to identify long term trends in the mean, minimum, maximum, and variation of inflow since the formation of the lake in 1956-2022. River inflow is generally increasing, and previous research has demonstrated that precipitation and temperature are increasing as well. We confirmed that mean precipitation and air temperature are increasing and found that these variables explain some of the variability in river inflow to the lake. We determined trends over time using linear models and identified significant relationships between metrics of inflow and mean air temperature and precipitation using correlation tests. The potential consequences of these results for water quality in the lake and the implications for recreational use will be discussed. The results of this study provide further insight into how freshwater lakes in the Northeast US are being affected by climate change and what those changes mean for human use of freshwater resources.

Preparation and characterization of cobalt(II) and nickel(II) ONO pincer complexes based on a bis-imidazole precursor

Abigail Araujo, Stephanie Coulombe, Joseph Trucchio, Audrey Wheeler, Samantha Erickson, Isaac Oullette, Connor Padover

Faculty Mentor: Dr. John Miecznikowski

College of Arts & Sciences

Booth: 53

This research is affiliated with Sigma Xi

This research was also presented at the American Chemical Society

This research was supported by the INSPIRE Award, the Science Institute, the Mancini Family Fund, and the Lawrence Family Fund

Abstract:

We have developed and synthesized a tridentate pincer ligand precursor, which possesses two oxygen- and one nitrogen-donor functionalities (ONO), based on a bis-imidazole precursor. The tridentate ONO ligand, incorporates a carbonyl-substituted imidazole functionality. We have prepared a flexible ligand system by employing the starting material 2,6-(dibromomethyl)pyridine to introduce a methylene linker into the pincer ligand precursor. We have metalated these ligand precursors to form cobalt(II) and nickel(II) complexes that contain this tridentate ligand. Details of the characterization (NMR Spectroscopy) of the ligand precursor and of the metal complexes (X-ray crystallography, electrochemistry, elemental analysis, ESI-MS), will be presented.

Short bis-pyridine-terminated Gly-Pro-Pro Peptide for Assembly for a Metal Helical Peptide Framework

Abigail Araujo, Stephanie Coulombe

Faculty Mentor: Dr. Matthew Kubasik

College of Arts & Sciences

Booth: 54

This research is affiliated with Sigma Xi

Abstract:

Metal-organic frameworks (MOF) are porous materials containing metals. There are potential applications for MOFs in catalysis, biomedical imaging, drug delivery, and storage of gasses. MOFs are highly diverse materials because the surface area, pore size, and surface properties can all be tuned for the desired application. We are synthesizing a short peptide-based MOF with the amino acid sequence Gly-Pro-Pro in order to metalate with silver(I) tetrafluoroborate. The silver(I) atoms will coordinate via the nitrogen donors of pyridine terminal groups. The peptide is synthesized using solid-phase peptide synthesis (SPPS) and wet chemical methods. Once synthesized, the peptide is characterized by MALDI-TOF spectrometry. The final MOF crystals will be characterized by various methods, including X-ray diffraction.

Adaptation of a Commercial Microwave Reactor for Solid Phase Peptide Synthesis (SPPS) of Peptide Oligomers Containing α,α -dialkylated Amino Acid Residues

Sarah Breslow, Kelley Ross, Colin Gorman

Faculty Mentor: Dr. Matthew Kubasik

College of Arts & Sciences

Booth: 55

This research is affiliated with Sigma Xi

This research was also presented at the American Chemical Society Spring 2024 Meeting, New Orleans, Louisiana

This research was supported by the INSPIRE Award and the Lawrence Family Fund

Abstract:

Microwave synthesis methods have been credited with accelerating the rates of chemical transformations and with achieving enhanced product purity. When paired with solid phase synthesis techniques, microwave reactors leverage the advantages of speed and purity with the convenience of synthesis in the solid phase. Unfortunately, commercial solid phase microwave units are expensive. We report here an inexpensive adaptation of a commercial microwave synthesis unit for the convenient manual solid phase peptide synthesis of oligomers of α -aminoisobutyric acid (Aib). Aib is notoriously difficult to couple, in solution and on solid phase supports, due to the steric hindrance of its geminal methyl side chains. We have used our apparatus to successfully prepare oligomers of Aib up to the octamer level. MALDI-ToF mass spectrometry data of prepared Aib oligomers will be presented.

Designing a fluorogenic peptide substrate to test cysteine protease specificity in biochemistry lab

Hailey Brunner

Faculty Mentor: Dr. Jillian Smith-Carpenter

College of Arts & Sciences

Booth: 56

This research is affiliated with Sigma Xi

This research was also presented at the American Chemical Society, New Orleans

This research was supported by the INSPIRE Award and the Lawrence Family Fund

Abstract:

An upper-level, multi-week biochemistry lab experiment was developed to combine solid-phase peptide synthesis, protease substrate specificity, and Michaelis-Menten kinetic learning objectives. Students, working in pairs, design their own fluorogenic peptide substrate to test a hypothesis regarding either the P2 or P3 specificity of a cysteine protease. After solid-phase peptide synthesis, students use both MALDI-ToF MS and post-source decay MS/MS to confirm successful synthesis. Students then test their substrate specificity hypothesis with a Michaelis-Menten kinetic assay using a microplate reader. In this report, the outline of experiments, pre-laboratory questions, representative data collected by students, and student comments about the multi-week laboratory will be provided.

Characterization of the Conductive Properties of Self-Assembling Peptides including Tyrosine Amino Acids

Chloe Falls, Giovanna Kalin, Maya Schaubert

Faculty Mentor: Dr. Amanda Harper-Leatherman

College of Arts & Sciences

Booth: 57

This research is affiliated with Sigma Xi

This research was also presented at the American Chemical Society National Meeting, March, 2024

This research was supported by the INSPIRE Award and the Lawrence Family Fund

Abstract:

Self-assembled peptides are biocompatible and easily synthesized. When peptides self-assemble they have the ability to form different nanostructures and macroscopic structures that can be used for various applications in the biomedical field and in nanoelectronics. A large number of peptides have been studied by researchers to learn about how the peptide amino acid order and resulting assembled structures change the properties of the assemblies for various purposes. Further research to understand how peptide length and amino acid order affect the structures formed and properties of the assemblies will continue to help advance the field. Our research looks at self-assembled peptides such as KLVYYAE, KLVYFAE, and KLVFYAE in order to determine how amino acids with aromatic rings (such as tyrosine, Y) affect peptide conductivity, both in terms of the number of aromatic rings and the order of these rings within the self-assembled peptides. The method we have used to measure conductivity is interdigitated electrodes as it allows us to get a direct measurement of the conductivity for each peptide. In addition, the structures of the self-assemblies have been characterized using transmission electron microscopy (TEM), Fourier-transform infrared spectroscopy (FTIR) and circular dichroism spectroscopy (CD).

Synthesis of a Peptide-Based Metal Organic Framework

Jenna Hanson, Isaac Ouellette

Faculty Mentor: Dr. Matthew Kubasik

College of Arts & Sciences

Booth: 58

This research is affiliated with Sigma Xi

Abstract:

Metal organic frameworks are useful in techniques such as filtration, chiral recognition, and second harmonic generation. Our efforts have focused on assembling a metal organic framework using peptides we synthesized with the use of a microwave reactor. We were able to synthesize a peptide trimer containing the amino acids, alpha-aminoisobutyric acid and leucine. We used nicotinic acid to attach a pyridine group to the N-terminus of our peptide. The synthesis of this peptide was then confirmed with the use of MALDI-TOF mass spectroscopy, identifying the H⁺, Na⁺, and K⁺ adducts with respective m/z values of 435.25, 457.25, and 473.25. We will proceed with attaching a second pyridine to the C-terminus of the peptide through the use of 3-aminopyridine. We plan on forming the metal organic framework using this synthesized peptide with silver ions, Ag⁺.

Exploring the Synthesis and Characterization of Gold and Silver Nanoparticles

Jenna Hanson, Abigail Dahlquist

Faculty Mentor: Dr. Amanda Harper-Leatherman

College of Arts & Sciences

Booth: 59

This research is affiliated with Sigma Xi

Abstract:

Nanoscience and nanotechnology involve the study and application of structures and systems on the nanoscale of 1 to 100 nm. There are a large number of applications for nanomaterials in fields ranging from chemistry and biology to engineering and physics. The goal of our research was to synthesize nanoparticles made of gold or silver, and to study how changing the type and amounts of reagents changes the size, shape and properties of the nanoparticles. Varying reagents allowed for the synthesis of gold nanospheres, nanostars, and nanoraspberries which we analyzed using scanning electron microscopy (SEM). We observed their unique shapes and used ImageJ Analysis to measure the average sizes of the nanoparticles. We compared our results to transmission electron microscopy (TEM) images found in the literature. In addition, we synthesized silver nanoparticles using varying amounts of potassium bromide which produced differently sized and shaped particles. The particles were also different colors, allowing the use of UV-Visible spectroscopy for characterization. We performed a catalytic reduction of 4-nitrophenol in order to discover more about the catalytic properties of each of the different sizes of silver nanoparticle samples. Overall, the synthetic parameters can greatly affect size, shape and properties of gold and silver nanoparticles.

It's All About the Base... The Purine Base

Julianna Manson, Rishi Black, Bianca Pineiro, Morgan Shirley, Tayana Jones

Faculty Mentor: Dr. Jillian Smith-Carpenter

College of Arts & Sciences

Booth: 60

This research is affiliated with Sigma Xi

This research was supported by the INSPIRE Award and the Lawrence Family Fund

Abstract:

Short self-assembling peptides can be modified on the N-terminus with purines to create nucleopeptides. These nucleopeptides combine the self-assembling properties of short peptides and hydrogen bonding recognition along the Hoogsteen face of guanosine to form nanostructures with different higher-order guanosine architectures dependent on their sequence and C-terminus chemistry. The Smith-Carpenter lab has characterized higher ordered guanosine-based structures, such as G-quartets or G-ribbons, using infrared spectroscopy and circular dichroism. To better understand the formation of supramolecular structures we have expanded our nucleopeptide library to include adenosine and inosine purines on the N-terminus and have synthesized nucleopeptides with either a carboxylic acid or an amide group to the C-terminus. The synthesis and characterization of these molecules will help our lab better understand the supramolecular architecture nucleopeptides can assemble into and what chemical reactions they are capable of facilitating.

Analysis of green solvent mixtures for nucleopeptide SPPS

Arden Massoia, Abigale Evangelista, Mia Bierowski

Faculty Mentor: Dr. Jillian Smith-Carpenter

College of Arts & Sciences

Booth: 61

This research is affiliated with Sigma Xi

This research was also presented at the American Chemical Society Conference Spring 2024

This research was supported by the INSPIRE Award, the Science Institute, and the Lawrence Family Fund

Abstract:

New research in GM-SPPS (green solvents mixtures for solid-phase peptide synthesis) and the 12 principles of green chemistry has inspired a search to find safer solvents to replace dimethylformamide (DMF) in fluorenylmethoxycarbonyl (Fmoc) solid-phase peptide synthesis. In recent years, new solvents for GM-SPPS have been reported that are as efficient as traditional SPPS solvents for peptides. However, these solvents have not been tested on the synthesis of nucleopeptides, peptide sequences that contain at least one nucleobase or nucleoside. This report will examine the use of two different GM-SPPS solvent mixture systems, dimethylsulfoxide and ethyl acetate (DMSO/EtOAc) and dihydrolevoglucosenone and diethyl carbonate (Cyrene/DEC), on the synthesis of the guanosine containing nucleopeptide gs-GKFF-OH. The parameters for comparison are resin swelling capability, nucleoside solubility, and overall nucleopeptide synthesis yields. As research applications using nucleopeptides continue to grow, there is a need for further research into green solvents for nucleopeptide SPPS.

Riboglow Synthesis: Comparing Illumination of RNA Between Different Peptide Linkages

Brooke Tatarian, Sebastian Lis, Kiera Cunningham, Rianna Mann

Faculty Mentor: Dr. Aaron Van Dyke

College of Arts & Sciences

Booth: 62

This research is affiliated with Sigma Xi

This research was supported by Georgetown University Department of Chemistry

Abstract:

We are currently synthesizing peptide linkers which will be used to find the most effective combination of linkers and fluorophores for enhancing RNA visualization in live cells. Peptide linkers connect Vitamin B12 to a fluorophore molecule and, when in close proximity, B12 acts as a quencher as it absorbs the light emitted by the fluorophore. The peptide linker begins in a folded state which positions the B12 and the fluorescent molecule close to each other. Upon the B12 binding with RNA, the linker undergoes a conformational change and becomes straight. The increased distance between the fluorescence molecule and B12 causes the fluorophore to become dequenched which allows for fluorescent tracking of the RNA. The composition of the linker affects the quenching ability of B12 and how well the RNA can be visualized due to differences in linker length and flexibility. Synthesizing a diverse group of peptide linkers will allow for further development of the riboglow RNA tracking technique used to gain a better understanding of cellular processes regulated by RNA in live cells. Our preliminary linker consists of an FMOC protecting group with four glycines and an OSu leaving group. As our project develops we will synthesize several other linkers, some composed of longer glycine chains and some using BOC as the protecting group instead of FMOC.

Elliptic Islands in Moon Billiards

Julia Jammalo, Lingran Zhang

Faculty Mentor: Dr. Mark Demers

College of Arts & Sciences

Booth: 63

This research is affiliated with Sigma Xi

This research was also presented at the 2024 Joint Mathematics Meetings and the 2024 Conference for Undergraduate Women in Mathematics

This research was supported by the National Science Foundation

Abstract:

Mathematical billiards are central models of dynamical systems in statistical mechanics in which point particles collide elastically with fixed boundaries. This project studies a class of billiard tables called moon billiards, whose boundary comprises two circular arcs, one concave and one convex. One of the primary objectives of this research project is to explore how the dynamics vary as a function of two system parameters: the radius of the larger circle and the distance between the centers of the circles. By studying a family of stable periodic orbits, we are able to identify elliptic islands in the phase space whose existence excludes the possibility of ergodic dynamics. By systematically varying the table parameters, we gain insights into the diverse behavior of the moon billiard system, uncovering regions of stability and hyperbolicity. This research was conducted at Fairfield University in the summer of 2023 with the support of National Science Foundation grant DMS 2055070.

Combinatorial Game Theory and its Application to The Game of the Amazons

Herbert Siewert

Faculty Mentor: Dr. Zhanar Berikkyzy

College of Arts & Sciences

Booth: 64

This research is affiliated with Sigma Xi

Abstract:

Combinatorial Game Theory is a branch of mathematics that has only recently garnered popularity as a branch of inquiry after the seminal publications "On Numbers and Games" by John Conway and "Winning Ways for Your Mathematical Plays" by Elwyn Berlekamp, John Conway, and Richard Guy. These publications demonstrated that games between two players with no chance elements and no hidden information, including games similar to Go, Chess, and Hex, contain a rich mathematical structure which has been further expanded upon and explored in recent decades. This research project primarily focuses on building an understanding of this theory and then applying the theory to a recently invented game from Argentina, "The Game of the Amazons", in order to develop optimal strategies in common positions.

Internal Wave Driven Mixing in Eel Canyon-Mendocino Ridge System

Madeleine Biardi

Faculty Mentor: Dr. Robert Nazarian

College of Arts & Sciences

Booth: 65

This research is affiliated with Sigma Xi and Climate, Coastal, or Marine Research

This research was also presented at the 2024 American Geophysical Union

Abstract:

Over the previous century, climate models have needed to adapt to an increasingly changing variation of factors in order to accurately predict climate in the coming years. With observations and a high-resolution simulation created by the Massachusetts Institute of Technology's global circulation model, or MITgcm, we can observe the processes and magnitude of internal wave mixing and the dissipation of energy in the Eel Canyon-Mendocino Ridge system. After running simulations of the region, our observations were shown to agree with the simulation data, which suggests that internal waves are responsible for the degree of dissipation observed. Due to this agreement, we can use this model further to interpret the energetics within the canyon, as well as how the vertical and horizontal dissipation of energy happens within the canyon. In Eel Canyon, we have also determined that dissipation of energy occurs at up to 400m above the bottom of the canyon, which is higher compared to that of other regions in the ocean. This dissipation was found to be highest at the thalweg of the canyon. Finding that energy propagating from Mendocino Ridge into Eel Canyon turns up the canyon is consistent with past research. Developing understanding of processes in which internal waves lose energy to mixing, and understanding the vertical structures of this mixing, informs next-generation ocean models on how they can incorporate mixing processes.

Projections of Future Extreme Snowfall in the White Mountains

Ethan Chow

Faculty Mentor: Dr. Robert Nazarian

College of Arts & Sciences

Booth: 66

This research is affiliated with Sigma Xi and Climate, Coastal, or Marine Research

This research was also presented at the 2024 American Geophysical Union

Abstract:

The White Mountains, a mountain range in northern New Hampshire and parts of southern Maine, is a region with many mountains and ski towns. This region is prone to heavy flooding, and has not been studied in terms of extreme snowfall. Past work on the northeastern United States has shown that extreme precipitation storms will increase in magnitude and frequency by less than the +7% °C⁻¹ expected by thermodynamics (Nazarian et al. 2022). Additional research that appeared from this previous work was specifically how snowfall will change rather than all precipitation. We bridge this gap in knowledge by conducting a regional study of the projected changes in extreme snowfall in the White Mountains through the end of the twenty-first century. Specifically, we use models from the 6th version of the Coupled Model Intercomparison Project (CMIP6). We expect to see an increase in magnitude of snowfall, and a decrease in frequency, based on a prediction of temperature increase and an extreme precipitation increase by the end of the century. By conducting this research, we hope to validate and quantify these predictions, and consequently determine the severity and frequency of the biggest future snowstorms in the White Mountains, helping residents and visitors be aware of the changes in the local area's climate through the end of the 21st century.

Projected Changes in Mean and Extreme Precipitation over Northern Mexico

Brody Matijevic

Faculty Mentor: Dr. Robert Nazarian

College of Arts & Sciences

Booth: 67

This research is affiliated with Sigma Xi and Climate, Coastal, or Marine Research

This research was also presented at the 2023 American Geophysical Union

This research was supported by the INSPIRE Award and the Mancini Family Fund

Abstract:

With a population of over 32 million, northern Mexico is crucial to the nation's economy and agriculture. There are three different hydroclimatic zones in the region, and each of them is susceptible to severe droughts and flooding, which have a significant socioeconomic impact. Despite this importance, characterizing future patterns in mean and extreme precipitation over Northern Mexico has not received much attention up to this point. We examine projected precipitation trends over the area in the NA-CORDEX ensemble of models. In order to validate the NA-CORDEX ensemble, we compare precipitation from historical simulations against precipitation data from the Multi-Source Weighted-Ensemble Precipitation (MSWEP) product. The simulations reasonably capture the climatology over the region. We then analyze the trends in both mean and extreme precipitation in the NA-CORDEX ensemble through the end of the century. Simulations suggest that there will be a meridional gradient in the changes in precipitation; mean and extreme precipitation are projected to decrease (increase) to the west (east) of the Sierra Madre Highlands. Additionally, simulations suggest that the frequency of the strongest storms is likely to double by the end of the century, compounding the trends in the magnitude of precipitation. Furthermore, the simulations suggest that the North American Monsoon characteristics may change, rendering the dry season even drier and the wet season even wetter. This will have an impact on infrastructure, the economy, and the agricultural sector.

Exploring the Longitudinal Effects of a Scientific Storybook Reading on Children's Persistence and Beliefs about Intelligence in STEM

Katelyn Bagley

Faculty Mentor: Dr. Amanda Haber

College of Arts & Sciences

Booth: 68

This research is affiliated with Sigma Xi

Abstract:

Previous research has shown that thematic differences in a story about a famous scientist's struggles (compared to a storybook emphasizing achievement without any mention of failure) led to greater academic performance in science classes for high school students. Such scientific storybooks have also been shown to increase young children's persistence on a challenging task and impact their beliefs about intelligence (children are more likely to endorse a growth rather than fixed mindset). Our study aims to examine how reading scientific storybooks about famous scientists such as Mae Jemison and Lydia Villa-Komaroff (representing groups that are underrepresented in STEM fields), impacts children's beliefs about intelligence and failure, as well as their engagement during a challenging scientific activity over time. Approximately 200 children (aged 4-6) will be assigned to one of three storybook conditions about either Mae Jemison or Lydia Villa-Komaroff: Achievement (focuses on success without any mention of failure), Effort (focuses on challenges on the path to achieving success), and Baseline (does not highlight success or achievements). Utilizing a longitudinal design, we will retest children one week after the storybook intervention to determine how the language in the scientific storybook impacts children's persistence and beliefs about intelligence and failure over time. These findings have the potential to shed light on how scientific storybooks can increase children's persistence during challenging tasks as well as their beliefs about success and failure in STEM-related fields.

The Empathy Dilemma: Can empathizing with a coworker's positive emotions cause you to feel more envy in the workplace?

Carolyn Bayha, Katherine Dobbie, Avery Zaines

Faculty Mentor: Dr. Michael Andreychik

College of Arts & Sciences

Booth: 69

This research is affiliated with Sigma Xi

Abstract:

Existing research on positive empathy primarily focuses on the beneficial consequences of empathizing with others' positive emotions. We tested the hypothesis that a potential downside of positive empathy is envy, in which empathizing with the positive emotions of an unlikable target would result in higher levels of envy. We presented college students with a hypothetical workplace scenario where a coworker received a promotion. These participants were assigned to one of three conditions to manipulate their perception of the coworker: unlikable, likable, or control. Then, in each of these three conditions, participants were instructed to empathize with the emotions of the coworker or to remain objective. Inconsistent with our hypothesis, results of this study suggest that participants had lower levels of envy when told to empathize with the coworker's positive emotions, regardless of whether the coworker was presented as likable or unlikable. These results indicate that positive empathy could be used as a strategy to lower envy levels in interpersonal and intergroup relations, which should be tested in future studies.

Reducing stigma toward the transgender community: A national survey study and stigma reduction evaluation

Braden Binger, Nicole Whelan, Reese Ranno, Robert Schattle

Faculty Mentor: Dr. Joseph DeLuca

College of Arts & Sciences

Booth: 70

This research is affiliated with Sigma Xi

This research was also presented at the LGBT Health Workforce Conference, May, 2024

This research was supported by the INSPIRE Award, the Science Institute, the Dr. Kathleen B. Trainor Research Fellowship, the E. Rhodes and Leona B. Carpenter Foundation, and the Mancini Family Fund

Abstract:

Background: Stigma toward the transgender (trans) community results in disproportionate negative mental health outcomes and barriers to full societal inclusion. Thus, researchers have focused on understanding predictors of trans stigma and developing trans stigma reduction programs. Interpersonal contact is one of the best ways to reduce stigma. Researchers have discovered online contact interventions can reduce trans stigma, but few have done so through recorded videos with diverse speakers. This is the first study to our knowledge to evaluate the impact of social-contact videos from an intersectional stigma perspective and determine their long-term effects (i.e., focusing on the social identities of participants and trans people in the videos with a 1-month follow-up).

Method: Participants from the general public (N=641) were recruited online using census-matched sampling (CloudResearch). The sample was majority white (57%), female (61%), middle-aged (M=42, SD=14.1), and college-educated (58%). Participants completed baseline questions regarding trans knowledge and were randomized to one of five conditions (four social-contact video conditions [~2 mins] & one no-video control). Each of the four videos depicted a trans person sharing their story (i.e., white/Black trans woman/man). Participants completed one pre/post-test question about trans knowledge, and then post-test measures of trans stigma (negative stereotypes & social distance).

Results: There was a significant increase in trans knowledge pre-to-post video intervention, $t(513) = 5.49$, $p < .001$. Regarding post-test stigma results, female (v. male) participants reported significantly fewer negative stereotypes, $F(1, 630) = 4.35$, $p = .037$ and less social distance toward trans people, $F(1, 630) = 12.81$, $p < .001$. Post-hoc analyses showed that participants reported more social distance toward a Black trans woman in the video (v. Black trans man), $t(224) = 1.92$, $p = .056$.

Discussion: Brief interventions show promise in increasing transgender knowledge and reducing stigma. Female participants may be more responsive to these interventions, and there may be higher

rates of stigma toward Black trans women – suggesting further exploration of stigma based on intersecting social identities. Results of our 1-month follow-up survey (March 2024), including qualitative findings, will shed more light on these preliminary findings (to be reported at the conference). Limitations notwithstanding (e.g., white, female, highly educated sample), these intervention videos may be adapted for various settings/audiences and these findings can help providers better understand the harsh public stigma faced by trans patients.

Aggression as a potential mediator between childhood trauma and intimate partner violence in college students.

Sabrina Cassarino, Nadia Tarhini

Faculty Mentor: Dr. Margaret M. McClure

College of Arts & Sciences

Booth: 71

This research is affiliated with Sigma Xi

Abstract:

Background. Intimate Partner Violence (IPV) is defined as physical, sexual, or psychological abuse of a person by their romantic partner. IPV is prevalent on many college campuses across the nation, and multiple students have to face the challenges of being in a toxic relationship throughout their academic experience. Experiencing IPV in college can be a predictor for domestic violence later in life.

Method. 218 participants were recruited from Fairfield University's general psychology classes. The sample included 48 men and 169 women, and 1 participant whose gender was not specified. The age range of participants was 18 to 23 ($M = 19.1$, $SD = 1.15$). Participants completed a battery of several inventories, including the Conflict in Adolescent Dating Relationship Inventory (CADRI) to assess IPV perpetration (IPV-P) and IPV victimization (IPV-V), Childhood Trauma Questionnaire (CTQ) to assess childhood emotional abuse (EA), emotional neglect (EN), physical abuse (PA), physical neglect (PN), and sexual abuse (SA), and the Buss Perry Aggression Questionnaire (BPAQ) to assess aggression, using on the online survey program, Qualtrics.

Results. Two linear regressions, one for IPV-P and one for IPV-V, were run using SPSS. We found that the regression was statistically significant for IPV-V ($R^2 = .057$, $F(16, 197) = 1.802$, $p = .033$). Two variables contributed uniquely, CTQ EN ($\beta = -.196$, $p = .042$) and aggression ($\beta = .224$, $p = .015$). For IPV-P, the model approached statistical significance ($R^2 = .044$, $F(16,197) = 1.610$, $p = .069$). Follow-up correlations suggest that aggression was significantly correlated with both being a victim ($r = .265$, $p = .004$), and perpetrator ($r = .250$, $p = .007$) for IPV. Aggression was also significantly correlated with CTQ EN ($r = .353$, $p < .001$). IPV-V and IPV-P were significantly correlated with each other ($r = .817$, $p < .001$), but were not correlated with CTQ-EN. No other analyses were statistically significant.

Discussion. We found that aggression and emotional neglect were significant predictors of IPV-V and there was a trend for perpetration as well. Childhood emotional neglect was not directly correlated with IPV; however, our results suggest that aggression may be a mediator in predicting both IPV-V and IPV-P. IPV-V and IPV-P were also correlated with each other, suggesting relationships with bidirectional violence, both were also related to aggression and emotional neglect. Based on our results, there is room for future research on other factors that may be able to mediate IPV-V and IPV-P. These results show hope for the future and can lead to new interventions to prevent IPV on college campuses, such as more counseling services or integration into first year curriculum.

The relation between interpersonal contact and substance use disorder stigma: An evaluation of social distance & disclosure expectations among young adults

Annie Cozens

Faculty Mentor: Dr. Joseph DeLuca

College of Arts & Sciences

Booth: 72

This research is affiliated with Sigma Xi

This research was supported by Science Institute and the Frederickson Family Innovation Lab Grant

Abstract:

Background: The prevalence of substance use disorders (SUD), as well as stigmatizing views of the diagnosis, is on the rise for college aged individuals, therefore impacting peer support and potentially preventing help-seeking behaviors. Personal experiences and associations with SUDs have an impact on levels of stigma (social distancing behaviors). This stigma, in turn, can lead to decreased levels of help-seeking behaviors. This study aims to research stigma, help-seeking behavior, and previous contact with an SUD.

Method: College-aged participants from the general public (N=203) were recruited online using census-matched sampling (CloudResearch). The sample had a mean age of 21.8 years old (SD = 2.84), was majority female (55.6%), and White (63.3%). Participants completed questions relating to personal contact with an individual who has an SUD (self, close friend, close family). Participants then completed the Social Distance Scale (SDS) and the Disclosure Expectations Scale (DES)

Results: No significant differences were seen between levels of social distancing and whether the participant had prior contact with an SUD (combined family & close friend), $t(58) = -0.72, p = .31$. When examining the individual questions of the SDS, those with prior contact through a family or close friend had lower levels of social distancing when asked about having an individual with an SUD as a neighbor, $t(58) = -2.34, p = .02$, or as an individual who they sat with on a bus, $t(58) = -2.26, p = .03$. No significant differences were seen between the DES and prior contact with an SUD.

Discussion: Limited associations show that there does not appear to be a strong connection between an individual's prior contact with an SUD and their personal social distancing behaviors as well as their help-seeking preferences. Lower levels of social distancing with having an individual with an SUD as a neighbor or sitting next to them on the bus may be due to the decreased interpersonal relationships seen within these two situations. Future studies may want to look more specifically at the individual's personal substance use in connection with their personal attitudes and behaviors. Limitations of this study include a majority white, female, senior-standing sample, as well as the use of an online self-report survey.

Cocaine's impact on novelty-suppressed feeding in male rats: anxiety and/or hunger effects.

Sunil Das, Lauren Bavaro, Nicholas Bloom, Michelle Dellamura, Olivia Fusillo, Marikate Kenny, Olivia Kozloski, Alexandra Murawski, Holly Rahurahu, Samantha Sullivan, Shaili Sullivan, Melia Swenson, Mia Van Mater, Alyssa Weidman, Josie Weidman

Faculty Mentor: Dr. Karl Schmidt

College of Arts & Sciences

Booth: 73

This research is affiliated with Sigma Xi

This research was also presented at the Northeast Undergraduate Researchers of Neuroscience

Abstract:

Cocaine's impact on feeding behaviors in rats, particularly in novel environments, remains a topic of significant interest due to its implications for understanding addiction processes. In this study, we employed the novelty-suppressed feeding (NSF) test to investigate the effects of cocaine on feeding behaviors in male, Long-Evans rats. The rats were randomly assigned to receive an acute injection of 10 mg/kg cocaine IP or 1 mL/kg saline before the NSF test was conducted. We used the NSF test to assess latency to approach, latency to consume, and amount of food consumed. Our results indicate that while there was no significant difference in latency to approach the food dish between the cocaine and saline groups, rats injected with cocaine exhibited significantly longer latencies to consume food and also consumed less food compared to rats injected with saline. These findings suggest that cocaine does, in fact, have an influence on feeding behaviors in novel environments. However, confounding variables such as external stimuli and repetition of the NSF test must be considered. Further research should address these concerns in order to make the results more reliable. This research is essential for advancing our understanding of the complex interactions between cocaine use and feeding behaviors in rodent subjects, ultimately informing us with strategies for addiction prevention and treatment.

Are People Aware of Their Implicit Attitudes? The Answer Might Depend on How We Ask the Question

Samantha Fuchs

Faculty Mentor: Dr. Michael Andreychik

College of Arts & Sciences

Booth: 74

This research is affiliated with the Honors Program Thesis and Sigma Xi

This research was supported by the Brinkman Research Grant

Abstract:

For many years, psychologists have distinguished between two attitude types: explicit attitudes and implicit attitudes. Unlike their explicit counterparts, implicit attitudes are believed to be introspectively unavailable – existing outside of conscious awareness. More recently, this long-standing assumption has been challenged by studies that examine awareness more directly, finding that people can accurately predict their implicit attitudes towards a wide variety of attitude objects, which suggests some extent of awareness. However, methodological limitations of these studies prevent strong conclusions about the extent to which people really are aware of their implicit attitudes. To move towards greater clarity of implicit attitude awareness, we examined the extent to which existing findings generalize across different methodological approaches by measuring awareness of implicit attitudes using a novel prediction task and a different measure of implicit attitudes than has been used in past studies. We found that participants could accurately predict their scores on this new implicit measure. These results align closely with the existing literature and demonstrate that predictive accuracy can persist across different approaches, enhancing our confidence that people are aware of their implicit attitudes.

Impact of Adolescent Social Isolation on Depression and Drug-Seeking Behavior in Male Long Evans Rats

Elani Gordon, Madeline Kitlas, Grace Lombardi, Jenna LaRochelle

Faculty Mentor: Dr. Shannon Harding

College of Arts & Sciences

Booth: 75

This research is affiliated with Sigma Xi

This research was also presented at the Society of Neuroscience and NEURON

This research was supported by the INSPIRE Award, the Dr. Kathleen B. Trainor Research Fellowship, and the Femia Science Endowment

Abstract:

In this pilot study, anxiety, depressive-like, and drug-seeking behaviors were investigated using male Long Evans rats who were socially isolated during adolescence. Our lab has previously shown that adolescent social isolation increases anxiety-like behaviors and impairs spatial learning in rats. In the present study, twelve rats were assigned to socially isolated or group-housed (3 rats per cage) conditions at P28 and remained in these conditions throughout the study. After five weeks, rats were tested for anxiety-like behaviors using the elevated plus maze (EPM) and open field test (OFT), depressive-like behavior using the novelty-suppressed feeding test (NSFT), and alcohol preference using a conditioned place preference (CPP) test. As previously reported, socially isolated males traveled less distance in the OFT, indicating heightened anxiety. In the NSFT, socially isolated males showed prolonged latency in food consumption, indicating depressive-like behavior. Additionally, in the CPP test, isolated rats spent more time than group-housed males in the alcohol chamber, suggesting a slight preference for alcohol. This pilot study will be continued in the fall with both female and male rats to investigate possible sex differences in behavior. These findings suggest that isolation during adolescence can have long-term detrimental effects on behavior.

An Experimental, Vignette-Based Study of College Students' Perceptions of Substance Use by Peers and Themselves

Ava Holmes

Faculty Mentor: Dr. Karl Schmidt

College of Arts & Sciences

Booth: 76

This research is affiliated with Sigma Xi

This research was also presented at the Northeast Under/graduate Research Organization for Neuroscience (NEURON) Conference

This research was supported by Science Institute, and the Frederickson Family Innovation Lab Grant

Abstract:

College students use drugs at a high rate, and many meet criteria for Substance Use Disorders (SUDs). However, these students do not often identify the symptoms of SUDs. Therefore, in an online survey of college students in the United States, we assessed students' abilities to characterize substance use by a hypothetical peer scenario or when they were placed in a matching scenario. Participants were randomly assigned to one of nine conditions: tobacco, alcohol, marijuana, Adderall, cocaine, Vicodin, heroin, a non-drug anxiety condition (stress ball), or a non-drug/non-mental health condition (lip balm). Respondents more often rated the substance use in the peer scenario as a problem or SUD than when rating the substance use in the self scenario. Differences in ratings between substances were also observed, with marijuana characterized as less serious than other drugs. These results indicate that college students should be offered additional information regarding SUDs.

The Sex-Specific Effects of Taurine Supplementation on Behavior in Socially Isolated Rats

Madeline Kitlas, Elani Gordon, Jenna LaRochelle, Grace Lombardi

Faculty Mentor: Dr. Shannon Harding

College of Arts & Sciences

Booth: 77

This research is affiliated with Sigma Xi

This research was also presented at the Society For Neuroscience, NEURON

This research was supported by the INSPIRE Award, the Science Institute, the Dr. Kathleen B. Trainor Research Fellowship, the Mancini Family Fund and the Femia Science Endowment

Abstract:

Previously, our lab has shown that social isolation beginning in adolescence increases anxiety-like behaviors and impairs spatial learning in Long Evans rats in sex-specific ways. The present study examined whether taurine, a semi-essential amino acid and dietary supplement that regulates GABAergic signaling, could improve behavior in socially isolated males and females. Rats arrived on post-natal day (P22), and were assigned to housing at the start of adolescence (P28): either socially isolated (SI: 1 rat per cage) or group housed (GH: 3 rats per cage) conditions. Rats also received either 1% (0.08 M) taurine supplementation or water in bottles throughout the study, producing four groups for each sex: SI + taurine, SI + water, GH + taurine, and GH + water. Five weeks later, open field and elevated plus maze were conducted to measure anxiety-like behaviors, and the Morris water maze was used to assess spatial learning and memory. It was found that social isolation increased anxiety-like behaviors in males and females. However, for SI females, taurine selectively increased distance traveled in the open field and open arm entries in the elevated plus maze, indicating restorative effects on anxiety-like behaviors. Additionally, taurine improved spatial learning in SI males only. These results complement our findings that SI impairs GABA-ergic signaling and has important implications given the increased prevalence of anxiety and depressive disorders during the COVID-19 pandemic.

Investigating the relationship between working memory and susceptibility to misinformation: A Behavioral and EEG Study

Kellyn Kuczarski

Faculty Mentor: Dr. Jessica Karanian

College of Arts & Sciences

Booth: 78

This research is affiliated with the Honors Program Thesis, Sigma Xi

This research was supported by the Dr. Kathleen B. Trainor Research Fellowship

Abstract:

Working memory is a type of memory in which information is actively maintained during the delay period. It is essential to daily cognitive functions such as reasoning, decision making, or remembering a piece of information. In a world with increasing exposure to misinformation, an important question is how an individual's working memory ability relates to their susceptibility to misinformation. Using behavioral measures and electroencephalography (EEG), the current study investigated the relationship between working memory and long-term memory performance in an eyewitness misinformation paradigm. During the study, participants watched a silent crime video, listened to a post-event auditory narrative summarizing the crime that contained consistent, neutral, and misleading details, and then completed a final memory test. During Experiment 1, behavioral data were collected from an online sample. Consistent with prior work, the data revealed a significant misinformation effect in which participants were significantly more likely to select misinformation after exposure to it during the post-event audio narrative. The results also revealed a significant positive correlation between working memory scores and overall memory performance. During Experiment 2, the same behavioral paradigm was employed while recording neural activity via EEG. Neural activity associated with the retrieval of misinformation and how that relates to working memory capacity will be discussed.

Acute stress exposure modalities differentially alter the discriminative stimulus effects of cocaine in male rats.

Sofia Nelson, Ava Holmes, Sam Shaffer, Alexis O'Shall, Miranda Listman, Pilar Mengotti

Faculty Mentor: Dr. Karl Schmidt

College of Arts & Sciences

Booth: 79

This research is affiliated with Sigma Xi

This research was also presented at the Society for Neuroscience Conference & Northeast Under/Grad Research Conference in Neuroscience

This research was supported by the INSPIRE Award, the Science Institute, and the Femia Science Endowment

Abstract:

Stress can be induced in rats by exposure to physical stimuli (restraint, wet bedding, cage tilt) and pharmacological stimuli (yohimbine). Previously, studies using male rats exposed to restraint stress have shown generalization of stress to the discriminative stimulus effects of cocaine. Here, we trained male Long-Evans rats to discriminate cocaine (5.6 mg/kg or 10 mg/kg) from saline in a two-lever operant task. After meeting training criteria, rats were tested on a multi-component, cumulative-dosing test session (0, 1, 3, 10 mg/kg of cocaine) to determine the impact of acute stress exposure across the stress modalities mentioned. The results indicate that the effects of stress on the discriminative properties of cocaine depend on the stressor modality.

Neural activity during retrieval of misinformation: An EEG Study

Jillian O'Brien, Sophia DiConza, McKayla Boyd, Kellyn Kuczarski, Olivia Bonacci, Erin Shah, Holly Rehurahu, Casey Nadzam, Mia Dacey

Faculty Mentor: Dr. Jessica Karanian

College of Arts & Sciences

Booth: 80

This research is affiliated with Sigma Xi

This research was also presented at the Psychonomic Society

This research was supported by Science Institute

Abstract:

The misinformation effect is the phenomenon when misleading information presented post witnessing an event can interfere with reconstructive processes and result in faulty memory reports. The current study aimed to investigate this paradigm along with the neural underpinnings of impaired recall. In our study, participants watched a silent video depicting a crime. After this, they listened to an audio narrative summarizing the crime that included misleading details. All participants took a memory test on what they watched earlier. In Experiment 1, we collected behavioral data from an online sample. Consistent with prior work, this revealed a misinformation effect such that participants were significantly more likely to remember misinformation when exposed to it during the audio narrative. In Experiment 2, we employed the same behavioral paradigm while we recorded EEG – a neuroimaging technique. The neural activity associated with the retrieval of misinformation as compared to retrieval of accurate information will be discussed.

Stress impacts on the interoceptive effects of cocaine in female rats.

Alexis O'Shall, Sofia Nelson, Sunil Das

Faculty Mentor: Dr. Karl Schmidt

College of Arts & Sciences

Booth: 81

This research is affiliated with Sigma Xi

This research was also presented at the Society For Neuroscience, Northeastern Undergraduate Researchers of Neuroscience

This research was supported by the INSPIRE Award, the Science Institute, and the Femia Science Endowment

Abstract:

The interoceptive effects of cocaine can be used to train rats to discriminate cocaine from saline. Here, we trained adult female Long-Evans rats to discriminate cocaine (5.6 mg/kg or 10 mg/kg) from saline in a two-lever operant task. We then tested whether acute stress exposure impacted the interoceptive effects of cocaine. Rats were exposed to either 15 minutes of restraint, wet bedding, tilted cage, or an injection of the pharmacological stressor yohimbine (2 mg/kg). Following stress exposure, rats were tested using a drug discrimination paradigm across 4 doses of cocaine (0, 1, 3, 10 mg/kg) using a cumulative dosing procedure. The results suggest that in female rats, certain stressors interact with cocaine's interoceptive effects to shift the discrimination profile.

Cocaine's influence on the reinforcing efficacy of sucrose in male rats.

Sam Shaffer, Sunil Das

Faculty Mentor: Dr. Karl Schmidt

College of Arts & Sciences

Booth: 82

This research is affiliated with Sigma Xi

This research was also presented at the NEURON Conference, Quinnipiac, April 2024

Abstract:

In addition to the euphoria and increased locomotor activity produced by cocaine and other stimulants, anorexic effects can also occur. We hypothesized that these anorexic effects would impact the reinforcing efficacy of sucrose, as measured by operant responding on a progressive ratio schedule of reinforcement. Preliminary results indicate a potential effect of cocaine reducing the break points of responding.

Does Awareness of Your Implicit Biases Help You to Control Their Influence on Your Behavior?

Caroline Sweeny, Cecilia Hall, Rory Keating, Grace Perez

Faculty Mentor: Dr. Michael Andreychik

College of Arts & Sciences

Booth: 83

This research is affiliated with Sigma Xi

Abstract:

Although recent research has shown that people are aware of their implicit biases, to date, no studies have examined whether being aware of one's biases helps one to control their effects on behavior. We tested the hypothesis that when individuals are aware of their implicit biases and given enough time, they can successfully prevent their implicit biases from impacting their behavior. We first assessed participants' levels of awareness of their implicit biases toward Blacks. Then, participants completed a behavioral task that typically reveals an influence of implicit bias on responding, under either a "less time" or "more time" condition. The results showed that when participants were aware of their implicit attitudes, they were able to prevent those attitudes from influencing their behavior when they had enough time to correct that behavior; this occurred in the "more time" group. The results also showed that when participants were aware of their implicit attitudes, they were not able to prevent those attitudes from impacting their behavior when they had to react in a shorter amount of time; this occurred in the "less time" group. To our knowledge this is the first demonstration that awareness of one's implicit biases helps one to control those biases, at least under certain conditions.

Hey Siri, How do Fish Breathe in the Ocean? Exploring How Children Decide to Direct Scientific Questions to and Evaluate Explanations Provided by Voice Assistants and Teachers

Melia Swenson

Faculty Mentor: Dr. Amanda Haber

College of Arts & Sciences

Booth: 84

This research is affiliated with Sigma Xi

Abstract:

Although children can acquire information through their direct experimentation with the world around them, children growing up in the digital age learn a great deal of information from people (e.g., teachers, caregivers, siblings) as well as technologies, ranging from the internet to television to digital voice assistants (DVA: e.g. Siri, Alexa, or Google Home). Yet, we know very little about how children trust information from DVAs. Whereas interactions with computers or the internet requires the ability to read, children can interact with DVAs in similar ways as with human informants. When a child interacts with a DVA, their primary way of acquiring knowledge involves asking questions. From a young age, children direct scientific (e.g., “Why do fish live in the ocean?”), autobiographical (e.g., “What is your favorite color?”), and emotional (e.g., “Why do people cry?”) questions to DVAs and adults. Within the science domain, the type of response the informant provides can shape children’s early learning. In the current study, we present children with five science questions and different explanations provided by DVAs as well as a classroom teacher. The study included five parts (i) scientific ask and endorse phase (ii) novel labels phase (iii) novel explanations phase (iv) explicit judgment phase (v) DVA familiarity question phase. In the first part of the ask and endorse phase, children are asked who they would rather ask to answer scientific questions (e.g., “If you are going to find out why it rains, which would you ask, Alexa/Siri/Google or your teacher?”). In the second part of this phase, the DVA and teacher will each provide an explanation in response to that question. Half of the children will be assigned to a condition where the DVA provides a non-circular explanation and the other will be assigned to a condition where the teacher provides a non-circular explanation. Non-circular explanations typically provide a logical explanation to a question. For example, if asked “why do lights turn on when you flip the switch?” a non-circular explanation may be “when the light is turned on the circuit is complete and that allows electricity to flow to the light.” Circular explanations typically reiterate the information in the question around in a circle. For example, if asked “why do birds lay eggs?” a circular explanation may be “birds lay eggs because they sit in a nest and then push out an egg and then there is an egg in the nest.” For the novel labels and explanation phases, the teacher and DVA will provide names and explanations for unfamiliar objects. For the explicit judgment phase, children will be asked a series of questions to assess their preference for learning from DVAs versus the teacher. Finally, in the familiarity question phase, children will be asked about their use of DVAs at home and reasons for using DVAs.

Psychological Well-Being among Adolescent Girls in the World Health Organization- HBSC Survey: The Impact of Early Menarche on Mental Health, Body Image, and Life Satisfaction

Nicole Whelan

Faculty Mentor: Dr. Joseph DeLuca

College of Arts & Sciences

Booth: 85

This research is affiliated with Sigma Xi

This research was also presented at the American Academy of Child and Adolescent Psychiatry (Oct. 2023) and the International Congress of Clinical and Health Psychology in Children and Adolescents (Nov. 2023)

Abstract:

Background: Mental health (MH) conditions often begin during adolescence, and there has been a global increase in youth MH problems in the past decade—particularly among adolescent girls. A similar, significant decrease in life satisfaction (LS) has also been reported among adolescent girls worldwide, per data from the World Health Organization’s (WHO)-Health Behaviour in School-Aged Children (HBSC) quadrennial survey and other datasets. Poor body image (BI) has also remained a challenge for youth per recent WHO-HBSC data, with nearly a third of adolescent girls (31%) perceiving themselves as being “too fat”. Although key developmental processes such as puberty impact adolescent health, very few HBSC studies to date have explored the impact of girls’ pubertal timing (i.e., age of menarche) on psychological well-being. Therefore, the objective of this study was to leverage a global sample of youth and explore relations between early menarche and various psychological outcomes (i.e., MH, LS, BI).

Methods: Data from the 2014 WHO-HBSC study (the last year that menarche was measured) were analyzed, focusing on adolescent girls from 38 countries/regions in Europe and North America (N = 56,767, M age = 14.48, SD = 1.26, range = 10.6 to 16.5 years old). It was hypothesized that girls with early menarche (< age 11 [n = 4,328] v. > age 11 [n = 52,439]) would have lower self-reported MH (HBSC-Symptom Checklist-psychological symptoms), LS(Cantril Scale/Ladder), and BI (single-item), controlling for age and BMI.

Results: Per MANCOVA, our hypotheses were supported and there was a statistically significant difference between menarche groups on the combined dependent variables, $F(3, 45704) = 42.191$, $p < .001$, Pillai’s Trace = .003, partial $\eta^2 = .003$. When analyses were conducted by country/region, this hypothesis was supported in 12/38 countries/regions (~32%).

Conclusions: Overall, early menarche among adolescent girls was significantly associated with poorer psychological well-being, though effect sizes were small and there was a significant heterogeneity by country/region. Future work is needed to better understand risk and protective factors and cross-national differences, including specifically for adolescent girls contending with other minoritized identities and inequalities.

Predictors of depression among college-aged women

Nicole Whelan

Faculty Mentor: Dr. Joseph DeLuca

College of Arts & Sciences

Booth: 86

This research is affiliated with Sigma Xi

This research was supported by the Dr. Kathleen B. Trainor Research Fellowship

Abstract:

Background: College-aged women face a multitude of adverse experiences during their academic careers. While this is a pivotal period for most young women, it can come with a host of mental struggles regarding newfound independence, academic goals, and the formation of their identity. One prominent struggle during this time for most young women is the risk of developing depression, and the rate of depression is increasing among young people. Researchers need to better understand risk and protective factors related to depression among college-aged women. The aim of this study is to identify the key variables that increase the risk for depression in college-aged women (i.e., anxiety, psychotic experiences, stigma, trauma, and menstrual conditions) and protective factors (i.e., resilience).

Method: We are recruiting 153 college-aged women (age 18-26) through the CloudResearch Connect platform who are undergraduates in the United States. A 10-minute survey has been sent to the participant group to collect demographic information and data on the specified variables. Specifically, we are measuring depression (PHQ), anxiety (GAD-7), psychotic experiences (PQ-16), adverse childhood experiences (ACEs aware), resilience (CD-RISC), stigma (SSOSH-3), and menstrual symptoms (PSST). We hypothesize the strongest positive relation between anxiety and depression. We also hypothesize that resilience will buffer this relation.

Results: Research still in progress.

Discussion (anticipated): The primary goal of this study is to identify the predictors for depressive symptoms in college-aged women. We anticipate that these findings can inform future research and potentially clinical work with college-aged women. Limitations of our study include recruitment from one online platform, self-report surveys, and geographic location.

ANDROID MALWARE DETECTION USING GENERATIVE ADVERSARIAL NETWORK

Daniel Reisman, Ashley Milone, Thomas Grimes, Aashay Bhoir

Faculty Mentor: Dr. Akshay Mathur

School of Engineering & Computing

Booth: 87

This research was also presented at the American Society for Engineering Education North-East Section Conference 2024

Abstract:

The rapid growth of Android apps and the worldwide popularity of the Android Operating System (AOS) has made it a prime target for malware. Even with continuous updates and fixed vulnerabilities, malware has shown continuously that it can evolve and exploit emerging vulnerabilities to infect even the latest Android devices. As a result, there is an increasing need for frameworks with the ability to dynamically identify apps that harbor malware. Previously proposed AI-based frameworks were often trained and tested against dated and known malware families and datasets already on the market. However, such works not only lose their relevance with time but may also be susceptible to generative adversarial example attacks, where data samples are generated by an attacker to fool the model, which can potentially degrade malware detection capabilities over time. To fill this void, we propose an Android malware detection framework that utilizes Machine Learning (ML) and Generative Adversarial Networks (GANs) to make the malware detection model capable of detecting such generative example attacks. In this proposed framework we analyze benign and malicious Android apps by reverse engineering them and analyzing the hardware API calls and permissions to classify the apps into the two categories using an ML model. We then use a GAN to generate new data samples based on the training data that is fed back into the AI model for further training and potentially be able to classify generated samples with high accuracy and low false positives. This form of generative training and testing has been proven to provide a robust framework in other disciplines that are continuously evolving. Our current ML model yields an accuracy of 91%, which can potentially be improved by training the model on samples generated by the GAN.

Third Party Cyber Risk Management

Ralph Riley, Rocio Bermudez-Ferrer

Faculty Mentor: Dr. Mirco Speretta

School of Engineering & Computing

Booth: 88

Abstract:

In a connected world of ever-growing cyber threats, businesses and organizations must always be vigilant to secure their key assets, environments and proprietary and confidential information. When companies engage with third party vendors, the same mindset must apply. The project's goal is to create an organization's vendor and third-party risk management program to reduce the likelihood of cyberattacks and continuously monitor vendor security posture and practices. For this project, organizational consideration focused on the financial sector, and its third-party services represented by digital file transfer hosting, digital education, and a financial payment and banking provider. Post analysis documents created were comprehensive program policies, workflows, questionnaires and automated systems to streamline the onboarding and the monitoring processes that maintain the required cybersecurity standards when engaging with online third-party services. The result of this project is represented by policies and specific vendor reports, including risk assessment, remediation suggestions, monitoring guidelines and risk profiling. The policies and the reports were created and vetted by subject matter experts in the online financial sector. These reports would assist organizations who need to constantly know the security and structure of the vendors they work with, which in return, help maintain their own internal security posture and continuity.

Predictive Analysis for Financial Services

John Thorme, Janna Schlageter, Ahmad Alfahad, Daa Juneidi

Faculty Mentor: Dr. Mirco Speretta

School of Engineering & Computing

Booth: 89

Abstract:

Companies are always seeking methods to improve their success in sales, especially when dealing with human interaction. Any advantages or areas of improvement companies find can and will lead to more customers. Growth of customer bases ultimately indicates more revenue. This industry project fell within the financial advising space and allowed us to work directly with Barnum Financial Group (Barnum). Barnum wanted to explore their customers and develop techniques to increase future success. Working alongside Barnum Financial Group, we focused on implementing machine learning strategies that can be deployed by Barnum to help better understand what is important when transitioning a potential customer into a converted client. Utilizing machine learning methods and algorithms can lead to the discovery of influences, trends, patterns, areas of improvement, and what success looks like. Utilizing these tools can lead to additional future successes in Barnum's goal of converting prospective clients into customers; potentially increasing efficiency. Therefore, to help Barnum Financial Group achieve their goals, Machine Learning is the most efficient method for solving these complex issues. We decided to implement K-means and Random Forest algorithms for this purpose. By gaining insight into the dataset through the K-means clustering algorithm, we aim to apply both Random Forest Classification and Feature Importance to identify Barnum's successful conversions and what characteristics are most present in these successes.

Automating Annotations for Leopard Vocalizations

Hammad Mansoor

Faculty Mentor: Dr. Danushka Bandara

School of Engineering & Computing

Booth: 90

This research was also presented at the American Society for Engineering Education (ASEE)

This research was supported by the NASA Connecticut Space Grant Consortium

Abstract:

Animal vocalizations provide a wealth of information on an animal and their surrounding environment. This acoustic data can help us understand the behavioral, physical and mental state of an animal, which can further help biologists better support the animal's health and well being. Our project aims to create an automated process using which biologists can identify and annotate Leopard vocalizations from recordings made at animal enclosures. These annotations will be used to study correlations between vocal characteristics and estrus in leopards. Currently, each 24 hour recording takes upwards of 74 minutes to annotate and each clip has to be manually extracted from the main recording. This is a manual task that requires an individual to carefully go through the recording and verify instances of leopard calls. Our focus is therefore, not only to reduce this annotation time but also to better allocate resources on more pressing tasks. For this, we use 'auditok', an Audio Activity Detection tool to isolate sounds that are above a certain energy threshold and then store them as individual clips while also retaining timestamp information. Preliminary tests on denoised recordings reveal that most animal vocalizations last about 30 seconds and occur in groups of 15 - 20 individual calls. Using auditok and a Python pipeline, we are able to successfully isolate these individual calls and store them as clips. We also store start and end times for each vocalization on an excel sheet for reference. Currently, we are able to identify all instances of grouped calls and ~85% of individual calls within each group within 30 - 50 seconds per file.

Security Implications & Controls for AI in the Enterprise

Thomas Norton, John Moore, Brian Lovett

Faculty Mentor: Dr. Mirco Speretta

School of Engineering & Computing

Booth: 91

Abstract:

The past year has brought the large scale rollout of Large Language Models (LLMs) such as OpenAI's Chat GPT and many organizations have already begun implementing LLMs and artificial intelligence (AI), but without the use of proper controls and policies, the likelihood of security compromise is likely. The fictitious company Fairguard is a mature investment management firm looking to deploy AI technology to provide a digital advisor and financial planner to their clients entering into a target date retirement fund. This AI advisor would tailor a client's investments in a target date fund based on historical and current market data complemented by specific information about that client including current assets, cash flows, liabilities, asset allocation, risk tolerance, income bracket, and spending levels. However, the AI system does not require access to personally identifiable information such as social security numbers, addresses, account numbers, etc. The objective of this project is to identify a series of controls to protect sensitive client data that is required by the AI system to conduct analysis, while segmenting non-required data from being accessed by the AI system to manage the overall risk exposure of the sensitive data. Subsequently, the project aims to identify Amazon Web Services (AWS) technologies to implement controls in accordance with the NIST AI Risk Management Framework.

Vulnerability Management For a Nonprofit Organization

Piterson Saint Fleur

Faculty Mentor: Dr. Mirco Speretta

School of Engineering & Computing

Booth: 92

Abstract:

The Diocese of Bridgeport operates a large network to support its 26 schools across Connecticut. This network is structured into four integral segments: the Data Center, the Catholic Center, PreK-8 schools, and High Schools. This is vital for their daily operations. At the heart of this network infrastructure is the Data Center. It is the technological lifeline of the Diocese that upholds and safeguards critical applications and oversees the fluid distribution of data. Considering the increasing cyber threats in today's digital terrain, the imperative intensifies for the organization to meticulously manage vulnerabilities, thereby fortifying the network's security.

Improving Categorical Majority Voting in Bagging Predictors Through Gradient Descent

Alvin Thomson

Faculty Mentor: Dr. Sidke Paheding

School of Engineering & Computing

Booth: 93

This research was also presented at the American Society for Engineering Education (ASEE)

Abstract:

Developing a robust and well-trained classifier using traditional machine learning methods can be particularly challenging, especially when dealing with complex real-world data. Bagging based classifiers offer a solution to this issue by requiring less effort to train multiple weak machine learning models and aggregating their outputs, typically resulting in superior performance. However, typical bagging-based methods suffer from a significant drawback: they treat each model equally, regardless of their accuracy. As a result, the ensemble may include a wide range of model strengths, with some models being better suited to the data than others. To address this variability, some approaches in ensemble learning employ stacking, where votes are weighted using a neural network. Nevertheless, this methodology can be computationally expensive. Instead, this paper explores the utilization of gradient descent to enhance the majority voting process inherent in bagging predictors. The cross-entropy function, a commonly used loss function for classification problems, was employed to calculate the cost. The study investigated two methods of weighting votes: first, by adding a bias term, and second, by multiplying votes to amplify their impact. The paper discusses the efficacy of both methods and identifies areas for further improvement. To evaluate the proposed methodology, we utilized five datasets from the UCI repository. These datasets are well-established and provide reliable benchmarks for assessing the overall effectiveness of the approach. The study concludes that both methods of weighted majority voting demonstrated promising results. While improvements were observed in some datasets, further research is recommended to refine the approach and maximize its efficacy across diverse datasets.

Design of Multitasking AI Chatbot with Large Language Models

Andrew Visceglia, Connor Hehn, David McNulty, Reyes Huerta

Faculty Mentor: Dr. Sidke Paheding

School of Engineering & Computing

Booth: 94

This research was also presented at the American Society for Engineering Education (Northeast Section Conference)

Abstract:

The rapid growth of Artificial Intelligence (AI) in recent years has been propelled by the development of generative AI applications from industry leaders such as OpenAI, Google, and Microsoft. IBM characterizes a chatbot as a computer program simulating human conversation, with contemporary iterations increasingly integrating conversational AI techniques like Natural Language Processing (NLP). These chatbots can be utilized across diverse domains, including applications in home speakers, messenger apps, and virtual assistants. An essential factor in the progression of modern AI chatbots is the application of transformer models, exemplified by architectures like GPT-3 (Generative Pre-trained Transformer 3). These models play a pivotal role in enhancing the capabilities of conversational agents, especially through the attention mechanism, which effectively captures contextual information, contributing to more coherent and context-aware responses. This work is dedicated to leveraging the capabilities of large language models for the development of a multitasking AI chatbot that is adept at handling both voice and text commands. We implement various functionalities such as listening to users, engaging in naturalistic conversations, conducting online searches, providing maps or directions for navigational purposes, and playing music, among others. Beyond these advanced features, the chatbot boasts bilingual proficiency, enabling it to understand and respond in both English and Spanish. This bilingual capability significantly enhances the chatbot's accessibility and usability, catering to a broader user base. Ultimately, we intend to define the chatbot's desired capabilities and fine-tune existing language models to achieve the intended results.

A New MetaLearning Approach Towards Artificial General Intelligence

Timothy Gould

Faculty Mentor: Dr. Sidke Paheding

School of Engineering & Computing

Booth: 95

Abstract:

Self Directed Task Identification (SDTI) much like the name suggests is the ability for an entity to independently determine a series of tasks to accomplish a longer term goal. The SDTI mechanism is the limiting factor preventing further research into Artificial General Intelligence (AGI). The general in AGI refers to general application meaning that the AGI model is capable of fielding any and all prompts with consistency and accuracy. One of the primary constraints on researching AGI is the fact that data pipelines need to be carefully curated by human researchers so that the correct task is learned properly by a machine learning model. The MetaLearning Model described in this research is capable of receiving multiple datasets and their corresponding labels for a wide variety of use cases and properly assigning each set of labels to the appropriate dataset using solely statistical metadata generated from each of the datasets. The end result is training a model to independently define its own learning tasks. In practice, the MetaLearning Model would be trained upon a large corpus of information and when deployed would be able to correctly assign labels for new datasets that produce similar metadata to what it was trained on. These data and label combinations would then automatically be passed through to a learning pipeline for a separate model.

Multi-Task Deep Learning for Scene Understanding

Timothy Gould, Hammad Mansoor, Benita Alexander, Priyanka Rajendrakumar Bhise

Faculty Mentor: Dr. Sidke Paheding

School of Engineering & Computing

Booth: 96

Abstract:

Scene Understanding involves a computer being able to understand the relative positions of objects within an image and the semantic relationships between them. It gives the computer a holistic understanding of the scene to make decisions in subsequent processing stages. Our project is aimed at building a system that can receive live video input for an indoor scene and perform three important scene understanding tasks: object detection, semantic segmentation, and image caption generation. The output of each of these subsystems is displayed together on a GUI with the corresponding live video feed. For the object detection task, we use a pre-trained YOLOv8 model that can localize object classes present in an image and build bounding boxes around them. Our Semantic Segmentation model is based on the architecture of the SAM (Segment Anything Model) model, tailored for recognizing and categorizing each pixel of indoor objects into distinct classes. Finally, the image captioning model is based on an encoder-decoder architecture that consists of the vision transformer and EfficientNetB0 algorithms, capable of analyzing semantic relations between objects and giving textual descriptions of activity within the image. All three models will run in parallel on video input from a tablet/laptop camera and each output will be displayed on one of four sections of a GUI that is built using Flask. The development of such a system is pivotal for applications in autonomous vehicles, indoor navigation, and localization, as well as enhancing security systems by providing continuous monitoring and logging of activities within a specified area.

Neural Network Task Classification using fNIRS

Lucas Danburg

Faculty Mentor: Dr. Danushka Bandara

School of Engineering & Computing

Booth: 97

Abstract:

fNIRS (functional near-infrared spectroscopy) is a proxy for measuring spatial brain activity based on movement of oxygenated and deoxygenated blood in the area. Based on previous analysis, aggregate fNIRS data (mean, min, max, etc) over a period of time can be used to predict the type of task that a subject was completing. Tasks are designed to test a variety of cognitive functions, including lexical processing, short term memory, and reaction time. In this study we aimed to instead use a recurrent neural network to analyze similar data, and attempt to predict a task type from that. A recurrent neural network will process the entire dataset and take into account how it changes over time, which could give insight into any time-dependent indicative patterns of activity.

Wearable sensors for On-Court Achilles Tendon Loading Measurement

Demia Bland, Roy Cook, Erin Gibbons

Faculty Mentor: Dr. John Drazan

School of Engineering & Computing

Booth: 98

Abstract:

Achilles tendon (AT) ruptures are a rare, but devastating injury that places considerable burden on individual patients and the healthcare system. One of the leading environments for AT ruptures is the basketball court or other in game situations when an individual eccentrically contracts their plantar flexors. Limitations to present technologies have prevented the collection of in game AT loading patterns to better understand this mechanism of injury. The purpose of this pilot study is to deploy wearable wireless insoles to demonstrate the feasibility of on-court data collection during basketball activities to measure simulated in-game loading patterns. This work was reviewed and approved by the Fairfield Institutional review board (#3956). We recruited 6 subjects who were recreationally active basketball players. We tasked them to perform a series of different simulated basketball activities while wearing instrumented insoles (LoadSol, Novel, USA) and capturing the movements on video. Subjects performed the lane agility drill to simulate explosive movements without the ball, 90° crossovers while sprinting down the court, mid-range shooting, three point shooting, rebounding, and blow-by layups, and three one on one drills. After this data was collected, a Matlab script was developed to analyze the AT loading during the performance of these controlled actions. The purpose of this student-led research study is to demonstrate that measuring on-court AT loading is possible. In the future, we hope to create a machine learning algorithm that will automatically identify and characterize unknown movements made by players on a basketball court. The study we are currently performing is helping us collect data that will then be used to teach a machine learning device which patterns of AT loading correlate to a specific movement using the controlled movements we are currently studying.

Directional Alignment of Electrospun Nanofibers Using Resin 3D Printed Micro-slots

Jacob Bornstein, Timothy Lyons

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 99

This research was also presented at the 2023 Biomedical Engineering Society Annual Meeting

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

Nanofiber directionality is crucial in various applications, notably composite materials, and tissue engineering. This research employs stereolithography (SLA) 3D-printed resin scaffolds with parallel micro-slots to guide the collection of nanofibers. It's postulated that the geometry of these micro slots creates field lines that push fibers in certain directions during electrospinning. The core aim of this study is to elucidate the directional alignment of nanofibers over these 3D-printed resin micro-slots and evaluate this alignment across varying micro-slot widths: 300, 400, and 600 μm . All scaffolds had dimensions of 8 mm x 10.4 mm and a height of 0.5 mm, with every micro-slot across the designs maintaining a uniform length of 3 mm. Five replicas of each scaffold design were fabricated for repeatability and accuracy in the study. The scaffolds were secured to an aluminum foil collector sheet by taping around their solid edges. An electrospinning apparatus was used to gather nanofibers using a 15% w/v PCL polymer solution for 30 minutes, using a 17kV electric field, a 1.5 mL/hour flow rate, an 18-gauge nozzle, and a 15 cm nozzle to collector distance. Scanning electron microscope (SEM) imaging revealed distinct patterns in nanofiber alignment; Nanofibers were consistently aligned perpendicular across micro-slots, and parallel along the resin between micro-slots. The nanofibers at the scaffolds' solid periphery, particularly areas distant from the micro-slots, showed a more randomized alignment. Furthermore, the SEM images depicted a pristine nanofiber collection process devoid of fiber beading or splattering. The insights gained from this study underscore the importance of micro-slot structure in nanofiber alignment and hint at vast potential applications, ranging from enhancing tissue engineering strategies to optimizing composite material manufacturing, ultimately paving the way for innovations across various scientific domains.

Triply Periodic Minimal Surface (TPMS) Lattice Structures for Thermal Protection Systems (TPS)

Antonia Gasparro

Faculty Mentor: Dr. Sriharsha Srinivas Sundarram

School of Engineering & Computing

Booth: 100

This research was supported by the NASA Connecticut Space Grant Consortium

Abstract:

Triply Periodic Minimal Surfaces (TPMS) are structures that repeat in a periodic pattern in three dimensions and are continuous. The gyroid is the most common TPMS structure as it exhibits exceptional mechanical properties. Because of this, these structures may be a potential candidate for fabrication of Thermal Protection Systems (TPS) for spacecraft. A TPS is a protective external barrier on spacecraft that is fabricated from fire retardant material. The goal of this research is to design and fabricate 25%, 50%, and 75% density gyroid and PMY TPMS structures with 0%, 5%, and 10% with nanoclay (Cloisite-116) and PLA. These structures will be tested under compressive loading following the ISO 604 standard and compared to ANSYS mechanical simulation results. Simulations will be conducted to determine charring characteristics & percent weight loss. STL files of gyroid and PMY structures with dimensions of 20 x 20 x 20 mm were generated using MS Lattice software. Solvent casting technique was used to cast 10 g of PLA and 1 g of nanoclay mixed with 200 mL of dichloromethane solvent into a film which was subsequently extruded into a filament. The fabricated filament was tested for uniform distribution of nanoclay using TGA. For the mechanical simulation, the structures were fixed on their bottom face and underwent 10% displacement (2 mm) on their top face to determine maximum stress and total strain. For the thermal simulation in ANSYS, 300. Convection current was applied on top surface of model. This is an ongoing project and the current results demonstrate that fire retardant TPMS structures will find applications in spacecrafts.

Autonomous Drone Swarms in GPS Denied Areas

Gabriel Grant, Lorenzo Arabia, Aldino Guadagnino

Faculty Mentor: Dr. Djedjiga Belfadel

School of Engineering & Computing

Booth: 101

This research was supported by the NASA Connecticut Space Grant Consortium

Abstract:

The Future of Drone Navigation: Autonomous Drone Swarms in GPS Denied Areas Lorenzo Arabia (ME), Gabriel Grant (ME), Aldino Guadagnino (ME) Advisor: Dr. Djedjiga Belfadel Abstract: In the ever-evolving landscape of drone technology, the reliance on GPS for navigation in various environments poses a challenge, prompting the need for innovative solutions. This project aims to design and construct an Autonomous First-Person-View (FPV) Drone capable of executing missions without depending heavily on GPS signals. The approach involves sensor fusion, integrating data from diverse onboard sensors to achieve redundancy and enhance the drone's autonomy. The core components include a powerful flight controller (STM32F722), Inertial Measurement Unit (IMU - BMI270), Barometer (BMP280), On-Screen Display chip (AT7456E), GPS unit (BN-880), Optical Flow sensor, Magnetometer, and a 500MB Blackbox Flight Recorder. By combining data from these sensors, the drone can determine its position and navigate. The communication protocol leverages ExpressLRS with a 500 Hz refresh rate, ensuring low-latency communication. The flight controller serves as the central hub for integrating sensor data, while the IMU and barometer provide crucial information about attitude and altitude. The On-Screen Display chip overlays essential flight data on the pilot's video feed. The GPS unit, initially employed for navigation, is augmented by a magnetometer. However, the long-term objective is to reduce dependence on GPS, fostering autonomy through advanced algorithm communication and sensor integration. The propulsion system comprises four motors with fixed-pitch props, generating 6.4 kg of thrust at full throttle, controlled by 32-bit electronic speed controllers. With a total weight under 700g, the system optimizes efficiency and flight performance. Power is sourced from 6S LiPo batteries, providing ample energy for extended flight times. The project has achieved significant milestones with the successful construction and configuration of two drones, validated through initial flight tests. The focus now shifts to fine-tuning and optimizing performance through software adjustments and data collection flights. This research contributes to the development of resilient, autonomous drones, capable of navigating challenging environments with limited GPS access, therefore expanding their operational capabilities across various industries.

Mixed Reality System for Organ Detection with Machine Learning Algorithms in Fetal Pig Dissection

Elia Haghbin, Vlad Surdu

Faculty Mentor: Dr. Xiaoli Yang

School of Engineering & Computing

Booth: 102

This research was also presented at the Biomedical Engineering Society Annual Meeting

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

Mixed reality technology blends virtual elements into the user's surroundings for interactive visualizations and digital simulations. The HoloLens 2 headset instantiates a mixed-reality environment with a wearable design featuring holographic lenses, camera arrays, and precise eye-tracking capabilities. Holographic image-guidance models merged with surgical systems have shown implications of tumor localization by increasing incision accuracy and reducing procedural attempts [1]. Remote HoloLens education for clinical procedures has further enhanced student learning with high consistency and accessibility [2]. However, real-time educational procedures face object-detection challenges during integration with the mixed reality environment. YOLOv8 algorithms leverage Ultralytics machine learning models for image recognition and classification. Although preliminary results show high rates of YOLO object detection [3], variations in object occlusion, environment lighting, and background complexity pose challenges to image recognition accuracy. These object detection challenges are further pronounced in hands-on educational activities and laboratory experiments. Anatomical dissections provide immersive student learning experiences for the study of biological organisms, structures, and functions. However, students encounter challenges in organ detection with complex variations in organ structure, size, orientation, and probable concealment by surrounding tissues. Our preliminary summer research in the development of a mixed reality system for fetal pig organ detection has shown promising results with high recognition accuracy. This study aims to enhance the student learning experience in fetal pig dissections by leveraging accurately-trained YOLOv8 models for image recognition and interactive guidance with the HoloLens mixed-reality headset. Machine-learning accuracy and student satisfaction will be analyzed with statistical data and usability tests.

Molecular Dynamic Simulations of Purple Membrane and Graphene

Elia Haghbin, Leslie Abbott

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 103

This research was also presented at the American Chemistry Society Spring Conference

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

The purple membrane of microorganisms contains bacteriorhodopsin proteins to transform solar radiation into energy through light-driven proton pumps. These light-absorbing pigments have applications in restoring vision degeneration with artificial retinas and optical memory devices. The adsorption of a bacteriorhodopsin monomer onto graphene sheets has previously shown enhanced Q photostat production, hydrogen bonds, and conformational changes to facilitate the photocycle for optical memory devices. This study analyzes Q photostat production with the absorption of bacteriorhodopsin trimers embedded in the purple membrane onto two graphene monolayers. The purple membrane was developed through the lipid bilayer generation, protein structure insertion, and simulation parameter setup functions of CHARMM-GUI. The purple membrane was generated with 70% PG and 30% BPG, GlyC, S-TGD-1, and PGS lipid composition. The trimeric bacteriorhodopsin structure from the OPM database was inserted into the lipid bilayers with Z-axis alignment and 90-degree rotation and underwent NaCl auto-ionization in a water box. The Visual Molecular Dynamics software merged two armchair single-layer graphene sheets for the experimental structure placed on the extracellular and intracellular membrane. Nanoscale Molecular Dynamics and CHARMM force fields were integrated to independently minimize and equilibrate the control and experimental compounds for three trials of 250 ns simulations. The trials will undergo simple and exhaustive analyses of molecular interactions, movement, and structure. The anticipated results are increased hydrogen bonding and electrostatic activity of bacteriorhodopsin in the presence of graphene with improved electron transfer capabilities.

Manufactured Low-Cost Automated Western Blot Apparatus

Ryan Jaworski, Julia Kilroy

Faculty Mentor: Dr. Uma Balaji

School of Engineering & Computing

Booth: 104

Abstract:

Western blotting, a key technique in molecular biology, detects specific proteins in complex samples through manual steps like gel electrophoresis and antibody incubation. However, automation technology is now streamlining these processes. Automated systems handle tasks such as gel electrophoresis, transfer, and detection, reducing errors and increasing efficiency. This advancement promises standardized protocols and improved reproducibility across experiments and laboratories, marking a significant evolution in western blotting techniques. Automation in western blotting reduces the time and labor required for experimentation, allowing researchers to focus on data analysis and interpretation. By standardizing protocols, automated systems also enhance the comparability of results between different studies and research groups. The proposed automated Western blot prototype integrates components such as 3D printing, Arduino, syringe pumps, and stepper motors to streamline the process. 3D printing allows for the fabrication of custom parts, reducing costs compared to traditional manufacturing methods. Arduino provides precise control over the operation of the syringe pumps and rocker. Syringe pumps deliver precise volumes of reagents, minimizing waste and increasing efficiency. Stepper motors enable precise movement of the blotting membrane and also rocker, ensuring uniform exposure to detection reagents. This automated system offers advantages over commercial alternatives, primarily in terms of cost-effectiveness. By utilizing open-source hardware and software components, the overall cost of the apparatus is significantly reduced compared to proprietary systems. Additionally, the modular design allows for easy customization and scalability, accommodating the diverse needs of different laboratories. All things considered, this automated Western blot apparatus is a reasonably priced option for scientists looking to optimize their protein analysis procedures without sacrificing high standards of precision and repeatability.

Polyvinyl Alcohol (PVA)/ Single Walled Carbon Nanotube (SWNT) based Electrospun Nanofibrous Scaffolds as a Matrix for Bacteriorhodopsin

Ryan Jaworski

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 105

This research was also presented at the 2023 Materials Research Society Fall Meeting & Exhibit

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

Single-Walled Carbon nanotubes (SWNTs), a carbon allotrope, are nanomaterials that have a high potential for being used in various types of applications including therapeutics and medical diagnostics where functionalized SWNTs are utilized. SWNT based biosensors are also finding increased interest for the detection of biological macromolecules. One technique that is used to create such carbon nanotube (CNT) based scaffolds is electrospinning where nanofibrous scaffolds are synthesized and optimized for porosity, fiber diameter and fiber orientation to be used in biomedical engineering, especially in biosensing applications. The optimization process for electrospinning involves optimizing electrospinning parameters that include flow rate, collection distance (between the nozzle and the collector), applied voltage, viscosity of the polymer, and the type of collector (plate, drum, or rotating disc). In the past different morphologies of electrospun nanofibers have been synthesized by researchers such as randomly distributed, aligned, core-shell, multiphase, pine needle, patterned, cobweb and hollow nanofibers for developing biosensor devices. Some of the biological molecules detected by such biosensors involved whole cells such as E. Coli, ligands such as glucose, or simply to check the pH or for detection of genes and enzymes. Furthermore, types of biosensors implemented based on the transduction method and utilizing electrospun nanofibers include piezoelectric, electrochemical, enzyme-based, non-enzymatic, thermosensitive, and optical biosensors. Here we come up with a polyvinyl alcohol (PVA)/ SWNT based nanofibrous scaffold to be used to detect the presence and location of a protein bacteriorhodopsin that exhibits photoelectric effects, essentially being able to store digital data in the form of protein conformational states. The electrospun PVA/ SWNT scaffold is found to be able to hold its integrity through the entire process of characterization and testing. A standard dispersion protocol is utilized to create a structured fluid containing SWNTs and PVA in deionized water enough for electrospinning. This is an ongoing research where the electrospinning parameters for the PVA/ SWNT scaffold are being optimized for the solution containing 5 μ m purple membrane patches housing the protein bacteriorhodopsin with a protein:lipid ratio of 75:25. The PVA/ SWNT control scaffolds are characterized using atomic force microscopy (AFM), scanning electron microscopy (SEM), Electrochemical Impedance Spectroscopy (EIS), and Energy Dispersive X-Ray Spectroscopy (EDAX), to quantify the fiber diameter, porosity, and presence and

location of SWNT nanoparticles. In future the data from the samples containing the PM will be compared to this control samples with and without SWNTs to precisely locate the purple membrane patches and their orientation on the scaffolds in and around the pores of the nanofibers as well SWNTs.

Development Of An Alternative Aerial Positioning System Using Optical Flow Localization

Noor Khattak

Faculty Mentor: Dr. Djedjiga Belfadel

School of Engineering & Computing

Booth: 106

This research was also presented at the American Society for Engineering Education 2024 at Fairfield University

Abstract:

GPS provides an absolute positioning system that many Unmanned Aerial Vehicles (UAVs) rely on heavily for accurate navigation. There may be instances, however, where this service is made unavailable, such as in cities, signal jamming, or on other planets. Past research has been conducted with alternative sensors to fill this gap left in the absence of GPS. Recent advancements in computer vision have made visual-based navigation a subject of interest in this regard. Most research conducted in this area uses computationally expensive image processing to determine and map an environment that can slow response time for flight. The optical flow sensor, on the other hand, is an embedded sensor that observes "flow vectors" to determine change between successive scenes without the need for image processing, and is the primary focus of this research. This system integrates an onboard Inertial Measurement Unit (IMU) and optical flow sensors, which provide acceleration and orientation data. This data, combined with pixel displacements, is converted into x and y displacement measurements, aiming to enhance Drone Velocity Control independently of external signals such as GPS. Both hardware and software systems are developed to characterize an optical flow sensor in flight. These include a robotic rail system for sensor benchmarking linear flight in different environmental conditions, as well as an avionics test bed that is tested against outdoor flight conditions. Ultimately, we observe that an embedded optical flow sensor displays far less drift than an IMU for integrated position estimation, and provides an output that scales linearly with altitudes of up to 20 meters.

3D Printing an Assistive Device Prototype for Personal Care

Julia Kilroy

Faculty Mentor: Dr. Susan Freudzon

School of Engineering & Computing

Booth: 107

Abstract:

Assistive technology devices have helped millions of people with managing mobility concerns, however, many assistive devices are produced for use with a general function rather than for a specific task along with the limitations of a specific disease state in mind. Many of these assistive devices are costly, and buying several devices for functions that do not apply to an individual's mobility needs becomes costly over time. One of the main disease states this assistive device seeks to address is arthrogryposis multiplex congenita (AMC), which refers to the development of two or more nonprogressive joint contractures before birth. Because many individuals with AMC must use a wheelchair or other assistive walking device, mobility is often a main challenge in completing everyday tasks. Upon interviewing an individual with AMC and conducting background research, it was found that the everyday task of shaving with an electric razor is a challenge because there are no low-cost assistive devices that allow the individual to complete this task effectively and independently. Currently, no devices exist on the market today that are made specifically to hold an electric razor so that it can be used by an individual with AMC. Similar products do not allow for completely hands-free use. This low-cost 3-D printed assistive razor holder is designed to allow individuals with upper extremity limb loss or disability to regain the ability to complete everyday tasks, such as shaving their face with an electric razor. The conceptual design prototype consists of a modular hose arm, a mounting clip to fit to the side of a table or arm of a wheelchair, and an adjustable holding clip to allow for any sized razor or object to be held in place securely. With this proposed design, individuals with AMC or other upper limb mobility loss can regain independence with everyday tasks.

Functional Near-Infrared Spectroscopy (fNIRS) Experiment Data Analysis Using ML Algorithm

Ruhuan Liao, Leslie Abbott

Faculty Mentor: Dr. Danushka Bandara

School of Engineering & Computing

Booth: 108

This research was also presented at the Northeast Bioengineering Conference (NEBEC 2024)

This research was supported by the INSPIRE Award and the NASA Connecticut Space Grant Consortium

Abstract:

Introduction: The purpose of this research is to utilize data collected from participants with the fNIRS device to classify human trust using brain activity data collected during specific tasks or activities. Participants were selected from Fairfield University's undergraduate and graduate student population (n=18), where the fNIRS data collection was conducted. The fNIRS device was used to measure the oxygenated and deoxygenated hemoglobin levels in the frontal cortex of each participant. Before collecting data, calibration of the fNIRS device was performed to ensure accurate probe readings and to minimize the influence of ambient light, which could potentially lead to data inaccuracies. By developing a machine learning algorithm using the calculated feature values for the oxygenated and deoxygenated channels as input features to train and test the processed fNIRS data, the aim is to understand how the brain activity works and uncover patterns of neural activation using analyzed data to train a machine learning model to predict accuracy.

Methods: In this research, we utilized a NIRx NIRSport2 fNIRS device operating at a sampling rate of 10 Hz to capture brain activity data. The device outputs raw light intensity signals which are then processed to obtain blood oxygen concentrations. These are further filtered using a third-order zero-phase Butterworth filter (filter range between 0.01 Hz and 0.5 Hz). During the experiment, these individual participants underwent a series of tests designed to induce differing levels of stress. They were prompted to determine whether they trust a computer-generated response to a question or not, while also indicating their confidence level in the provided answer, which is then recorded. The filtered hemoglobin level data then undergoes preprocessing, which includes parsing timestamp files using Python scripts to determine the time range for data segment boundaries and extracting the relevant time series for each trial. The data analysis entails computing mean, standard deviation, kurtosis, min, and max values as feature values for each hemoglobin channel for each trial. Several machine learning methods were tested on the resulting dataset to assess the binary trust classification performance. Interpretation of the models involves examining the feature coefficients of each channel column to obtain the feature importance values. In conducting binary classification tasks, the workflow begins with logistic regression without undersampling, followed by logistic regression with undersampling,

random forest, and gradient boosting. Model training includes Z-score normalization using the standard scaler technique specifically for logistic regression. Further analysis involves assessing model accuracy, visualizing feature coefficients, and analyzing confusion matrices and ROC curves to evaluate performance.

Results: Our analysis uncovered a relationship between hemoglobin levels and binary trust values. Using a leave one subject out method, we calculated the classification performance of our model. These findings highlight the potential of fNIRS-derived data and machine learning techniques in analyzing trust within the brain.

Conclusions: The logistic regression model achieved an accuracy of 0.760 without undersampling and 0.723 with undersampling. Meanwhile, the random forest model demonstrated a slightly higher accuracy of 0.749, while gradient boosting achieved an accuracy of 0.790 on the dataset. These results indicate a reasonable predictive capacity of the models.

Simulation of Bacteriorhodopsin Based Biosensor Using COMSOL

Matthew Manduca

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 109

This research was also presented at the 2024 Biomedical Engineering Society

Abstract:

COMSOL is a versatile tool that is used for simulating a number of physical properties for nano and biomaterials. This ongoing research project involves the use of reaction bioengineering and transport of diluted species modules within COMSOL to simulate the flow and reactive properties of the protein bacteriorhodopsin with a mesh of polyvinyl alcohol (PVA) nanofibers with and without carbon nanotubes (CNT). The randomly oriented PVA/ CNT nanofibers are modeled as a mesh on a flat aluminum foil closely mimicking the electrospinning process where such as a scaffold is synthesized in the wet lab. The goal of this study is to understand how concentration and flow of bacteriorhodopsin protein is affected by PVA, CNT and a composite of PVA/ CNT providing a link between the reaction kinetics and transport phenomena over the surface of such a biosensor. It further also accomplishes the purpose of simulating the time factor in a dynamic environment that is needed for the analyte to undergo a change from planar to radial to linear diffusion over such a scaffold. Throughout the simulated experiment, typical conditions of fiber diameter, random orientation, porosity and multilayer are maintained to replicate and confirm the simulated data experimentally. Cylindrical models of randomly oriented nanofibers are created as PVA nanofibers and CNT on a real scale of 200nm diameters for the nanofibers and 90nm for the multi-walled CNT, with a typical length of 5 to 20 μm . A rectangular block around the PVA/ CNT model served as an air or aqueous environment for the biosensor device. The overall composite model was then meshed using a standard rectangular mesh at the finer level to simulate it and finally integrated to determine the concentration of the analyte and the time required to reach the planar, radial, and linear diffusion. Among the physical attributes of the interaction, the concentration, velocity, and pressure of the protein were analyzed throughout its trajectory through the mesh of PVA/ CNT scaffold over the aluminum substrate. It is anticipated that the results from this study will be useful in understanding the diffusion based interaction of bacteriorhodopsin with PVA and CNT components on a randomly oriented PVA/ CNT electrospun nanofibrous scaffold.

Understanding a Qubit Through COMSOL Based Simulations of a Quantum NOT Gate

Nicholas Murphy

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 110

This research was also presented at the 2024 Materials Research Society Fall Meeting

Abstract:

Quantum computing is a complex area of study that investigates computational ability on the quantum scale, which is meant to expand our current understanding of digital data processing beyond classical paradigm. These quantum computers have the potential to take over digital technology with ease, outpacing digital technology in every category, from process speed to security purposes. Researchers are optimistic about the future of quantum computing owing to its supposedly vast applications if understood and implemented efficiently. Many companies have been racing to revolutionize this field, where the leaders in the technology industry have been funding quantum computers utilizing supercooling approaches to realize quantum gates and logic creating the beginning of quantum computers. Based on the current literature, we find that these computers have multiple quantum bits, quantum gates, and a variety of quantum logic. However, for our research, we are investigating only one qubit and its implementation through a quantum NOT gate. This is ongoing research where we are using the software COMSOL to simulate a quantum NOT gate, also known as the Pauli X gate. The purpose of this quantum gate is essentially to reverse the input, making a $|0\rangle$ into $|1\rangle$, and $|1\rangle$ into $|0\rangle$. We aim to achieve this simulation of a quantum gate using a common material, such as a silicon wafer, at room temperature, thereby simplifying the implementation aspect in the real world that typically requires supercooling facilities. The COMSOL module aiding our simulation is the AC/DC module, which will utilize the multiphysics simulation approach that we believe is the perfect application to experiment with different materials such as silicon wafers, graphene-based nanoplatelets, graphene nanoribbons and graphene quantum dots, and varying environments in the form of air and aqueous interfaces to study the performance of the quantum gate. We expect a functioning quantum gate simulation using our specified materials and environments and anticipate that our simulated results will align with our preliminary expectations and calculations.

Validation of Open Source, Markerless Motion Capture for Use Outside of the Lab

Melanie Napierala, Breanna Lowe, John Minogue

Faculty Mentor: Dr. John Drazan

School of Engineering & Computing

Booth: 111

This research was also presented at the Orthopaedic Research Society (ORS) and Biomedical Engineering Society (BMES)

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

Motion capture utilizes estimations of joint locations and angles to examine musculoskeletal movement. The analysis of joint angles can be used to investigate injuries and improve performance. The current gold standard for motion capture is a marker-based system which requires reflective markers and infrared cameras to capture human movement. Despite its accuracy, the system is confined to the lab space, limiting data sets to those willing to travel to the lab and not allowing data collection of athletes on the field. Other limitations include high costs, inaccurate data due to sensitivity to lighting and extra reflective surfaces, and time-consuming subject setup. The validation of an open source, markerless motion capture system requiring only a laptop, calibration board (3D data collection only), and three webcams (3D data collection only), poses a benefit to data collection outside the lab as the system is mobile and does not require special equipment. The purpose of this study is to validate the accuracy of markerless motion capture by collecting subject data simultaneously using the marker-based and markerless systems. The project was reviewed by the IRB at Fairfield University (#4081). The validation was performed in 2 and 3-dimensions. In tracking joint angles in the 2-dimensional sagittal plane, subjects (n=23) were asked to perform 3 movements including 10 body-weight squats, 10 heel raises, and 5 countermovement jumps. The joint angles of the right hip, knee, and ankle were recorded through the marker-based system directly while the joint angles of the markerless system were calculated from the joint locations collected by the system. In validating the accuracy of the markerless system in 3-dimensions, subjects (n=23) were asked to perform 10 body-weight squats, 10 heel raises, 5 single-leg countermovement jumps, and 5, 45-degree cuts. A python code was created to synchronize data from both systems and determine the correlation, RMSE, and ROM%. In analyzing the 2-dimensional data, the study found an overall RMSE of $\leq 10.992^\circ$ for lower sagittal kinematics of the hip, knee and ankle. The RMSE value for right lower leg joint angles during squats and countermovement jumps shows a “very strong” correlation (≥ 0.953) suggesting the possible use of the markerless system outside the lab. Considering the 3-dimensional data, there was a “strong” correlation in squatting, single leg countermovement jumps, across all joint angles with a value of ≥ 0.883 . The 45-degree cut showed “moderate” correlation for hip and ankle joint angles

($r=0.652$ and 0.393 respectively). Heel-raises showed “weak” correlation for the hip (-0.127) and knee (0.31), which suggests markerless motion capture is not ideal in capturing joint movements ≤ 5 degrees. As we continue to learn more about the capabilities of markerless motion capture, we find that it is a promising tool to collect motion capture data outside of the confines of the traditional laboratory.

Synthesis of PVA and MWNT Based Electrospun Scaffold for Applications in Impedimetric Biosensors

Maeve O'Connell

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 112

This research was also presented at the Biomedical Engineering Society Conference, Baltimore, October 2024

This research was supported by the Corrigan Scholars Fund, the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

A recent topic of interest in the field of tissue engineering is the fabrication of multiwalled carbon nanotubes (MWNT) electrostatically spun with polyvinyl alcohol (PVA), creating nanofibrous scaffolds that have a potentially significant use towards developing impedimetric biosensors. The process of dispersing the PVA (10 wt%) involved mixing it with deionized water using a hot plate, bath sonication, and tip sonication, and then turning the liquid polymer dispersions into solid nanofibrous scaffolds with MWNT (0.005 wt%) by using electrospinning procedure on the NS+ electrospinner, which utilizes a high-voltage electric field to create nanofibers out of a liquid polymer. The experimental dispersions containing both MWNT and PVA were electrostatically spun over seven trials to determine the ideal parameters that would create nanofibrous scaffolds that had minimal beading, were porous, and maintained similar morphology to the control sample. For each trial, a viscometer was used to measure the viscosity of the polymer solutions before and after the addition of MWNTs. To examine the morphology of the scaffolds, a scanning electron microscope (SEM) was used, which also evaluated the porosity, fiber diameter, and locations and orientation of the MWNT within the PVA scaffold. Results suggested that while it may be difficult to synthesize PVA/MWNT scaffolds while maintaining ideal morphology, they show promising possibilities for applications in impedimetric biosensors. Currently, the addition of the protein bacteriorhodopsin (BR) containing purple membrane to the PVA/MWNT scaffolds is being investigated to examine how this protein interacts with the PVA nanofibers and MWNT.

Cricothyrotomy Training Device

Maeve O'Connell, Ryan Jaworski, Matthew Manduca, Emma Crowley

Faculty Mentor: Dr. Susan Freudzon

School of Engineering & Computing

Booth: 113

This research was also presented at the Northeastern Bioengineering Conference

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

PhDEmergency Cricothyrotomy is used in life-threatening situations to secure the airway to provide oxygenation and ventilation to patients. This procedure is done when patients cannot be intubated and is used as a last resort. All clinicians who are responsible for airway management must be trained in this procedure. This includes emergency medicine physicians, anesthesiologists and nurse anesthetists. Training is typically performed on a manikin specially designed for practicing cricothyrotomies. These mannequins are very expensive and cost approximately \$2,000. These mannequins have a removable trachea piece that can be replaced after multiple uses. In consultation with faculty in the Nurse Anesthesia program at Fairfield University, the goal of this project is to develop and manufacture an affordable cricothyrotomy training system to be used by the nurse anesthetists in training. The nurse anesthesia program is growing and it will directly benefit the program to have more manikins for students to use for training. Additionally, this design could be provided as an open-source tool to provide a more affordable option for training to do this emergency procedure. A 3D model was developed using Solidworks software that was 3D printed using some hard materials and some soft materials to mimic the neck and trachea. There is an open source model of a trachea that is available through the International Airway Collaboration that is incorporated in this model. The surrounding neck was custom designed to support this trachea. A silicone sheet mimicking skin is placed on top of the neck. Nurse anesthesia residents will be able to palpate the anatomy, make incisions and insert a breathing tube. Tubing connected to a balloon will allow confirmation of the correct placement of the breathing tube. Once the model is tested and verified, we hope to make this available for others to download and print.

Analyzing the Impact of Inserted 3D Printed Scaffold on Electric Field Distribution in Electrospinning: A Computational Approach

Megan Rourke, Alana Hayes

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 114

This research was supported by the Corrigan Scholars Fund

Abstract:

Electrospinning is a pivotal technique for fabricating nanofibrous materials, with broad applications in tissue engineering, drug delivery, and filtration. This process, which utilizes an electric field to draw polymer solutions or melts into ultrafine fibers, is significantly influenced by parameters such as polymer properties, solution viscosity, applied voltage, and processing conditions. Despite experimental evidence showing that 3D printed scaffolds, when placed within the electrospinning machine's electric field, affect nanofiber alignment, the specific mechanisms driving this phenomenon remain elusive. Previous studies have explored the impact of electrode shapes, including collectors and spinnerets, on the distribution of the electric field. Additionally, research involving the rotation of the collector has demonstrated its capability to direct nanofibers, further complicating the understanding of electric field dynamics and fiber deposition. However, the specific effects of 3D printed scaffolds, positioned within the electric field on the collector, have yet to be thoroughly examined. This study aims to dissect the role of 3D printed scaffold in electrospinning by employing COMSOL Multiphysics simulations to compare electric fields around non-conductive and conductive scaffolds. Specifically, we examine a non-conductive polymer 3D printed scaffold against a conductive stainless-steel scaffold, focusing on differences in electric field distribution and flux. The scaffolds, measuring 6.9 mm in length and 5.8 mm in width, consist of four layers of 0.3 mm wide struts, spaced 0.8 mm apart, with alternating layers oriented perpendicularly. Utilizing an 18-gauge needle, a 15 cm distance between the needle and the collector plate, and a 17 kV voltage, this investigation sheds light on the significant role scaffolds play in affecting electric field distribution, paving the way for optimized electrospinning parameters to enhance the functionality of 3D printed scaffolds in tissue engineering applications. By elucidating the differential effects of conductive and nonconductive scaffolds on electric field distribution during electrospinning, our study contributes to the refinement of electrospinning practices. This advancement holds the promise of significantly improving the design and functionality of 3D printed scaffolds, thereby advancing their application in regenerative medicine and tissue engineering.

Polypyrrole based Electropolymerized Scaffold for Implementing Bacteriorhodopsin Memory Device

Kylie Wistran

Faculty Mentor: Dr. Isaac Macwan

School of Engineering & Computing

Booth: 115

This research was also presented at the Biomedical Engineering Society

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

Polypyrrole (Ppy) is a very widely used soft electrically conductive biomaterial with applications in biomedical engineering. In the past cyclic voltammetry (CV) has extensively been used to synthesize Ppy films with and without carbon-based nanoparticles to improve the rigidity of the composite material by doping it with carbon allotropes. Furthermore, electrochemical impedance spectroscopy (EIS) can be easily utilized to measure the impedance and hence application specific electrical conductivity of the Ppy nanocomposites. The main goal of this research is to optimize the CV parameters to synthesize such a Ppy film from a heterocyclic organic compound in the form of pyrrole solution, with and without single walled carbon nanotubes (SWNT). The chemical makeup of pyrrole consists of a five-membered ring made up of four carbon atoms and one nitrogen atom making it a good candidate for adsorption of SWNT. At room temperature, the solution is a liquid with a faint yellow color making it almost colorless, and along with the salt, Na₂SO₄, it has better precipitating properties as well as an improved ability to crystalize. We utilized a three-electrode system, a graphite plate working electrode (WE), a Silver/ Silver Chloride (Ag/AgCl₂) reference electrode (RE), and a platinum Counter electrode (CE), with the potential applied between the WE and RE and current measured between WE and CE, thereby providing the current-voltage (CV) plot. Furthermore, utilizing EIS in the three-electrode configuration, it is found to have the right electrochemical properties for protein adsorption. The protein that is tested with the synthesized film is a bacterial purple membrane bacteriorhodopsin (BR) protein, which is sensitive to light making it an ideal biological macromolecule for biomedical applications such as artificial vision and biological memory storage. The processes of reaction kinetics and mass transport are investigated to better understand the interface between SWNT and BR and that between BR and Ppy. The synthesized films containing BR and SWNT are analyzed using a scanning electron microscope (SEM) to understand the morphology of the composite material and more importantly to locate the BR and SWNT on the Ppy film. Similarly, EIS and viscometer data are utilized to optimize the CV parameters to acquire better quality films. This is ongoing research that seeks to come up with a reliable scaffold made up of Ppy film for the BR protein to be utilized in biomedical engineering applications.

A Comparative Study of Image Enhancement Techniques for Underwater Images

Nusrat Zahan

Faculty Mentor: Dr. Sidike Paheding

School of Engineering & Computing

Booth: 116

This research was also presented at the American Society for Engineering Education (ASEE)

Abstract:

Underwater photography in low-light conditions often yields images characterized by poor contrast, reduced brightness, a limited grey scale, color distortions, and significant noise. These challenges not only degrade the visual quality perceived by humans but also significantly hinder the performance of machine vision systems. Furthermore, as light travels through water and undergoes absorption and scattering, underwater images commonly experience color shifts and diminished contrast. These adverse effects obscure underwater visibility, weaken contrast, and can even produce color casts. Image enhancement, an important technique in image processing, aims to improve the clarity and utility of images, making them more suitable for their intended applications, such as object detection and segmentation. This research offers a comprehensive review of current state-of-the-art image-enhancing methods and evaluates them using metrics on benchmark datasets for underwater image enhancement. Enhancing underwater image is a difficult task and it has gained popularity recently. Many deep neural networks have been proposed and implemented in this discipline because of the current dominance of deep-learning-based solutions in this field. In this work, several deep learning methods, including SRGAN, ESRGAN, and SwinIR, will be evaluated. By comparing these models for underwater image enhancement, we will determine which model is most suitable for the underwater image enhancement task. With thorough investigation and analysis, this study strives to provide an exhaustive reference for future research in the field, advancing the frontiers of image enhancement technologies.

SuSTEMability: SUSTAINABILITY FOCUSED STEM ACTIVITIES

William McLaughlin, Stephen Borrelli, Noah Duncan, Breanna Lowe, Margaret Millar, Lorenzo Arabia, Andrew Mejia Hernandez

Faculty Mentor: Dr. Uma Balaji

School of Engineering & Computing

Booth: 116/117

This research is affiliated with the Center for Social Impact

This research was also presented at the American Society for Engineering Education North East Region Conference

This research was supported by Constellation (E2 Energy to Educate) funded project titled SuSTEMability and the Center for Social Impact

Abstract:

The SuSTEMability project addresses fundamental challenges to a sustainable energy future through STEM activities for youth. The goal of the project is to convey the importance of renewable sources, responsible energy usage and environmental safety and get youth engaged and invested in a sustainable future for all. Student volunteers called Fellows, from school of engineering and computing work with faculty to create an engaging and accessible curriculum for attracting underrepresented K-12 students to STEM through age appropriate hands-on activities. The activities focus on sustainable energy sources namely solar and wind energy. It also includes discussion on environmentally safe practices that lead to sustainable future for all. Building simple circuits with LED, solar panels and motors and wind energy-based generators are some of the STEM activities presented to elementary and middle school children in the local community. The Fellows and their faculty mentors visit Cesar Batalla public school to present to 7th and 8th grade students in their class-room . They also conduct STEM activities related to robotics and sustainable health care solutions with youth in the after-school program at the Wakeman Boys and Girls Club. Davenport Ridge Elementary School students visit the Fairfield University Innovation Annex and engage with student mentors on STEM activities including experience with industry scale robotic arm. Overall, participating K-12 gain understanding of the science of renewable energy, the value of adopting good practices for creating a safe and sustainable future for all. The participating student mentors gain leadership skills and communication skills. Additionally, they become practitioners and advocates for sustainable development.

Automated Fabric-Skin Friction Measurement System

Teawon Kim, Justin Foun, Antonia Gasparro, Donna Ismail

Faculty Mentor: Dr. Sriharsha Srinivas Sundarram

School of Engineering & Computing

Booth: 117

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society for Engineering Education (ASEE)

Abstract:

Understanding textile to skin relationship is an essential part of creating laundry products such as detergents and softeners. Thus, there is a need for a reliable and customized testing device that accurately measures friction between skin and fabric, providing valuable data for the development of textiles that enhance comfort and reduce skin irritation. A commercially available portable device called the Frictiometer FR700 provides the ability to measure friction between skin and fabric. This device was tested on the human body with a variety of different techniques and fabrics. From these experiments, the data showed that the Frictiometer yields accurate results. However, due to the sensitivity of the device, there is a large amount of variability when it is held with the human hand. The goal of this project is to design and fabricate an automated holder that can apply a constant force on the skin, removing human error. The design consists of a holder with an integrated force sensor in which the Frictiometer is held. The holder is mounted on a linear screw connected to a stepper motor. The system is controlled by a script written in Python that moves the Frictiometer in the vertical direction based on the force sensor readings. The system is currently being tested for its reliability and effectiveness. This will be achieved if the device yields a lower variability while incorporating the holder than without it.

Veritas Hub: Mobile Application for Catholic Connection and Engagement

Timothy Ahern, Juthika Rasul, Hannah Howard

Faculty Mentor: Jefferey Kramer

School of Engineering & Computing

Booth: 118

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society for Engineering Education (ASEE)

Abstract:

This project delves into the design and development of a mobile application for Veritas Catholic Network, a Catholic media company, with the aim of becoming a dynamic hub connecting the community. Employing Agile software development methodologies, the team undertakes the challenge of creating a user-friendly application tailored for both Apple and Android platforms. The mobile app aspires to transcend traditional broadcasting boundaries, offering an immersive experience that extends beyond into the realm of mobile and social media platforms. The app's core features include live broadcasts, Spanish broadcasts, curated podcasts, video content from Veritas and external sources, and an interactive community section. This community space serves as a virtual Areopagus where users can share, engage, and connect with events, discussions, and daily devotionals. The project draws inspiration from successful apps, aiming to infuse a clean, playful, and colorful design into the Veritas Catholic Network app. The Agile approach involves iterative development cycles, to respond dynamically to user feedback and evolving project requirements. The development stage includes the integration of features such as community calendars, news sections, devotionals, and the ability to donate to Veritas through the app. The design phase focuses on refreshing the app's look and feel, inspired by aesthetically pleasing apps in the same domain. This project is characterized by continuous improvement and scalability. Phased releases are envisioned, with each version introducing new features and improvements. Testing across various devices and platforms ensures a robust, bug-free user experience. In short, the project aims to deliver a transformative mobile app experience for Veritas Catholic Network, fostering connectivity, engagement, and spiritual growth within the Catholic community. Through this project, the goal is to contribute a valuable tool that aligns with Veritas' mission and is crafted for their diverse audience.

Ultrasound Phantom for Regional Anesthesia

Julia Kilroy, Ryan Baker, Emma Crowley, Wilson Kaznoski

Faculty Mentor: Dr. Susan Freudzon

School of Engineering & Computing

Booth: 119

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the Northeast Bioengineering Conference (NEBEC), American Society for Engineering Education (ASEE)

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

This project aims to provide the Nurse Anesthesia Program at the Fairfield University Egan School of Nursing with a brachial plexus ultrasound phantom for regional anesthesia training. The project will become open source and will assist trainees in performing interscalene nerve blocks. However, there are currently no reusable, low-cost ultrasound phantoms for regional anesthesia that exist on the market that accurately simulate the anatomy involved in an interscalene nerve block. Existing solutions are often expensive, not durable, or anatomically inaccurate, which can limit accessibility for institutions to purchase the device and users' experience with an accurate training tool. To address this problem, we created a reusable, low-cost ultrasound phantom for regional anesthesia that accurately simulates the anatomy involved in an interscalene nerve block. By creating a custom silicone mold and brachial plexus nerves and arteries out of latex tubing, we produced a realistic silicone model of the neck and shoulder area that allows for ultrasound-guided needle insertion and manipulation. Low-cost materials, accuracy of anatomy, ease of use, and reproducibility of the phantom help increase access to training, thus improving patient outcomes.

Electro-Pneumatic Air Shock Optimization System with User Specified Parameters and Integrated Driver Control for Off Road Vehicles

John Chiodo, Kyler Erezuma, Joseph Westhoff, Sarah Leonetti

Faculty Mentor: Dr. Sriharsha Srinivas Sundarram

School of Engineering & Computing

Booth: 120

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society for Engineering Education

This research was supported by the INSPIRE Award

Abstract:

This system enhances suspension performance in off-road vehicles that utilize airshocks. During vehicle operation, it allows for driver input and external monitoring, eliminating the need for manual adjustments. Integrating an onboard computer, pneumatics, and a user interface, the technology employs shock pressure values to optimize suspension performance. Tailored for performance-centric markets like off-road racing organizations and personal vehicles, the system aims to redefine operational performance. The system will be installed on the 2022 Fairfield University mini-Baja vehicle to show functionality and to further develop it.

Application Requirements Manager - Appian App Development

Christian Morgan, Aaron Montenegro, Ibnath Saboor

Faculty Mentor: Dr. Subhrajit Majumder

School of Engineering & Computing

Booth: 121

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society for Engineering Education

Abstract:

With a small staff and many different developers including contractors, interns and companies, the Application Development team at the Diocese of Bridgeport needs to be able to collect, analyze, size, cost, track user requirements into the various technical components that will be developed into a working application. To accomplish this, the Diocese is developing the Application Requirement Management (ARM) application. This application is a web-based application that will act as the central platform gathering, analyzing, and integrating user requirements into a functional and simple application. ARM will be a standalone application built using a low-code development programming platform, Appian. The application will assist the application business stakeholders, business analysts, and developers to communicate, gather, and document system specifications for technical requirements for an application. The ARM application will serve as a means to collect and analyze these user requirements and develop them into a working application. The ARM application will allow project staff to easily track requirements, document them, and turn them into an application. To build an application like ARM, we will be building a database, building screens, and configuring the application to be used by all the different types of groups. We have already written system requirements documents as well as various diagrams and charts outline the database schema. We are currently in the process of building the database, and will soon begin designing the different screens. The primary goal of this project is to engage with stakeholders, users, and subject matter experts to understand their needs, gather requirements, and document them. The next objective is to document the requirements in a structured format, such as the SRS document template we have created, including functional and non-functional requirements, quality requirements, user acceptance criteria, and MVP description. We will then utilize those documents to develop the ARM application.

Automated Pipe End Deburring System

Seamus Dwyer, Joseph Crowley, Megan Rourke

Faculty Mentor: Dr. Djedjiga Belfadel

School of Engineering & Computing

Booth: 122

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society for Engineering Education Conference, Fairfield University

Abstract:

The project outlines a novel automated approach to deburring small metal pipes, a crucial manufacturing process that involves removing small strands of material from a chamfered surface, commonly performed on metal pipes. This stage is vital, especially for very small pipes, as even microscopic discontinuities can weaken a part, making it more vulnerable to failure. The pipes we aim to deburr serve as a shaft to guide the hot filament threads in 3-D printers. The filament thread is very fragile, so both the inner and outer surface of the pipe edges must be free of discontinuities to prevent it from catching or snapping. Manual deburring is impractical for such small pipes, while deburring by drilling tends to be excessive and ultimately weakens the pipe. Our project aims to implement an automated system that deburrs pipes of this size through brushing, using a linear actuator. Bristles gradually wear away; therefore, the brush must be periodically replaced to ensure consistency in production. The current system requires its brush to be replaced twice per an 8-hr operation shift. Our objective is to extend this lifespan so the part only has to be replaced approximately twice a week. For the system to be truly automated, we sought to eliminate the need for pipes to be manually loaded onto the actuator individually. We designed a singulator device in which a narrow blade moves vertically within a trough holding pipes to select only one at a time and raise it to the height of the brush. A pipe housing, which we also designed, is fastened to the moving platform of the actuator and forces precise alignment with the brush on its axis. The actuator's function of moving the pipe is controlled using Q-Programmer software. We will utilize a loop code in the software which causes the moving platform holding the pipe in its housing to move incrementally further up the length of the spinning brush as the number of deburring cycles increases. This will prolong the lifespan of each brush and ensure a uniform deburr. The project is deemed successful if it can at least match the efficiency of the deburring system that is currently used by our sponsors at Biomerics, for an output of 50-60 deburred pipes per hour.

AI and MR-Based 3D-Printer Tutorial

Julian Toro, Jason Rosales, Nicole Perugini, Matthew O'Leary

Faculty Mentor: Dr. Xiaoli Yang

School of Engineering & Computing

Booth: 123

This research is affiliated with the Engineering Senior Design Team

Abstract:

In this work, we introduce an interactive 3D learning module that employs the Microsoft HoloLens 2 headset to assist students in learning how to operate the Ender 6 3D printer. The objective is to enable engineering students to learn how to use lab equipment more intuitively. Developing a detailed 3D model of the Ender 6 3D printer is crucial to the project, as it facilitates real-time object recognition in the HoloLens 2 environment using the YOLOv8 algorithm. By leveraging this model, users can engage in an interactive lesson that provides comprehensive instructions for each stage of the 3D printing process. To foster a deeper understanding of the equipment and its operation, each step is supplemented with extensive supporting materials, including written instructions, visual aids, and multimedia content. The goal of the tutorial system is to offer users a safe and immersive method to familiarize themselves with the operational procedures and features of the equipment through a hands-on learning experience in a virtual environment. The project seeks to enhance learning outcomes in engineering education by boosting student engagement and retention through the introduction of an interactive and user-friendly learning platform. The integration of Mixed Reality (MR) technology enables users to interact concurrently in both virtual and real-world environments, thereby enriching the educational setting. Users can learn at their own pace under the real-time guidance of the interactive HoloLens 2 tutorial, which ultimately promotes self-directed learning and problem-solving skills. This initiative represents an attempt to utilize MR technology to advance engineering education. The approach employed in this project has the potential to transform how engineering students acquire practical skills, ultimately equipping them for success in their academic and professional pursuits by merging immersive visualization with interactive instruction.

Manufacturing Processes Library Application

Habibul Huq, Mateo Davalos, Jonah Lydon

Faculty Mentor: Dr. Akshay Mathur

School of Engineering & Computing

Booth: 124

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the 2024 American Society for Engineering Education Northeast Section Conference

Abstract:

Colonial Coatings Corporation provides specialty coating services to most prime aerospace contractors and the commercial sector. With the expansion of their company, they face myriad challenges in managing and retrieving over 1000 physical manufacturing process booklets, needing an efficient system for organizing and accessing these crucial documents. Moreover, there is a pressing need for authorization mechanisms to control access to sensitive materials and ensure that only authorized personnel can view and/or edit files. Their existing solutions, such as relying on traditional filing cabinets and manual booklet management, fall short of addressing the company's document management needs. Furthermore, while their digital booklets offer an alternative, their management remains cumbersome due to the lack of efficient retrieval mechanisms. Although pre-built databases and web applications are available, they often need more customization to meet the specific needs of an organization like Colonial Coatings. Recognizing these challenges, our team is embarking on the development of a comprehensive web application tailored to meet the unique needs of Colonial Coatings. Our primary objective is to deliver a user-friendly platform accessible through a tablet or PC, offering seamless access for searching, viewing, downloading, and re-uploading booklets tailored to Colonial Coatings' specific requirements. The application will prioritize efficient storage and retrieval of booklets, ensuring a smooth and intuitive user experience. We utilize two databases for this application, where one manages and logs user data and permissions to ensure precise control over who can access, add, and modify booklets to the system, and the other manages the storage and retrieval of digital booklets, which can be converted to PDF format dynamically for enhanced accessibility, security, and compatibility. Currently, the frontend and backend utilize various technologies such as HTML, CSS, JavaScript, Kotlin, Java, and MySQL, to provide a smooth, robust, and well-working product with continuous improvement through feedback and lessons learned. Through this solution, Colonial Coatings can effectively organize and manage its crucial process documentation, and enhance operational efficiency, security, and compliance.

Institutional Door Sensor

Kameron Reynolds, Michael Hamilton, Gabriel Grant

Faculty Mentor: Dr. Uma Balaji

School of Engineering & Computing

Booth: 125

This research is affiliated with the Engineering Senior Design Team

Abstract:

This project focuses on the development of an Institutional Door Sensor. The primary purpose is to enhance security in psychiatric centers, ensuring the safety of patients and staff by providing timely and accurate monitoring of patients positioning themselves in proximity to the door for a continued amount of time. The monitoring system does not violate the privacy of the patient as it does not use a camera. Current generic door sensor systems may lack sensitivity to the specific needs of mental health patients, necessitating a specialized solution. The project's objectives include designing a tamper-resistant, flush-mounted or hidden door apparatus with adjustable detection distances, typically set at six inches. The system is battery-powered. The device should automatically cease operation when the door is open to prevent false detections. The prototype of the sensor utilizes Ultra-Wide Band (UWB) Technology to detect the persistent presence of humans. The design of the system focuses on integrating a small form factor microcontroller, in this case, a Raspberry PI with a UWB sensor (NOVELDA X4) and simple LED detection on the door. This minimizes the production and installation of the unit. The operational flow of the system starts with the UWB Sensor detecting presence, transmitting signals to the Raspberry PI, and notifying users through network and/or cell phone as well as simple LED indicators mounted on the door. Additionally, the project adheres to standards such as NEMA WD 7-2011, IEEE 1557-9638, HIPAA, QSO-19-12, and RoHS, ensuring compliance with motion sensor standards, electrical safety, patient privacy, anti-ligature specifications, and environmental restrictions. In developing this device, both ethical and environmental factors are paramount. Ethically, it's crucial to avoid the use of optical sensors resembling video cameras to uphold privacy laws, particularly in sensitive environments such as psychiatric care. Moreover, reliability is of utmost importance, recognizing the device's critical role in preventing self-harm among patients. On the environmental front, considerations center on minimizing the device's carbon footprint through low-power consumption and addressing potential issues related to battery disposal. By prioritizing both ethical and environmental considerations, we ensure that the device not only meets its intended purpose but also aligns with broader societal values and sustainability goals.

Motorized Deadbolt And Mortise Lock

Sarah Johnson, Gerald Malloy, Emmett Tolis

Faculty Mentor: Dr. Naser Haghbin

School of Engineering & Computing

Booth: 126

This research is affiliated with the Engineering Senior Design Team

Abstract:

In recent years, the popularity of smart security devices has surged, paralleled by technological advancements. Notably, the market for these devices reached a valuation of USD 79.16 billion in 2022. Responding to this trend, our sponsor, Accurate Lock & Hardware, aimed to develop a smart security device tailored for the average homeowner. Our project's goal was to engineer a remotely controlled, motorized deadbolt lock, leveraging the design of an existing Accurate Lock & Hardware manual lock. Our approach involved testing various motors to identify one that could efficiently operate the lock mechanism. Ultimately, a 12V DC motor was chosen for its capability to actuate the bolt with the required force. This motor was interfaced with an Arduino microcontroller, enabling remote operation through commands sent from a secondary Arduino unit. Additionally, a custom metal interface was fabricated to connect the motor to the lock mechanism. The assembly of microcontrollers and the motorized system was integrated into the lock, culminating in a functional prototype. This poster presentation details the system's operation, demonstrating the lock's ability to engage and disengage upon receiving commands from the Arduino. Following this proof of concept, the prototype will undergo optimization for mass production.

Multi-Use Robot Gripper

Dominic Oliveri, Kevin Paquette, Timothy Holewienko

Faculty Mentor: Dr. Sriharsha Srinivas Sundarram

School of Engineering & Computing

Booth: 127

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the 2024 Annual American Society of Engineering Education Conference

This research was supported by the INSPIRE Award and the Hardiman Scholars Fund

Abstract:

This project is focused on the design, evaluation, and fabrication of an end effector fixture for integration with the ABB CRB 15000 COBOT robotic arm system. The primary objective is to develop an efficient gripping system capable of automating the process of picking and placing a PTFE-coated stainless steel backing mesh and a porous nickel membrane sheet. The current process involves the robotic arm applying adhesive to a metal cassette, followed by manual placement of the materials, leading to manufacturing inefficiencies and precision challenges. The primary objective is to improve efficiency by automating both adhesive application and material placement. The end effector design must adhere to stringent precision standards, providing a 1 mm (about 0.04 in) tolerance to ensure accurate and reliable performance. The system is also engineered for cost-effectiveness and simplicity in manufacturing, being produced using a Markforged Onyx One 3D printer. This 3D printer, serving as a composite material printer, combines base materials with reinforcement materials to produce a final product. For this project, Onyx was used as the base material and carbon fiber was used as the reinforcement material. This combination of materials gives a dimensional accuracy of around 150 microns, leading to a refined and robust final product. The final design of the end effector incorporates a lifting diffuser using 1D compressible flow, leveraging compressed air to generate high suction forces during pick-and-place operations. In summary, this project synergizes robotics and fluid dynamics to deliver an advanced end effector solution, optimizing manufacturing processes. By integrating these elements, the project streamlines industrial workflows, providing increased efficiency, precision, and reliability in adhesive application and material placement. The automated gripping and placement system achieves precision and ensures a consistent, high-quality assembly of specific components.

Robot Integration Into a Manufacturing Process

Alana Hayes, Robert Doster, Aniyah Pettway

Faculty Mentor: Dr. Naser Haghbin

School of Engineering & Computing

Booth: 128

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the 2024 Annual American Society of Engineering Education Conference

Abstract:

Robotic arms have revolutionized modern manufacturing, with calibration precision up to 0.1 mm where efficiency ranged between 10% to 50%. This project aimed to integrate the Epson Vision Guide, Safety Sensors, and an Electrical Plug-and-Play gripper with an Epson 6-axis robot, targeting automation enhancements at Accurate Lock and Hardware. The initiative sought to boost the production line's efficiency and precision, signaling a leap toward the company's manufacturing modernization. Detailed setup, configuration, and programming were required to ensure the robotic systems' seamless functionality within the manufacturing environment. The electric plug-and-play gripper, essential for the precision of pick-and-place operations, was a critical component. Utilizing Epson RC+ 7.0 simulation software, we tailored a robot path specific to pick-and-place tasks, significantly enhancing process efficiency. This optimization allowed for operations within -200 mm to 920 mm in translation and rotation, with the pick-and-place timing streamlined to 50 seconds to 1 minute, based on the set speed, marking a substantial improvement in operational efficiency. Challenges arose from the robot's sensitivity to specific motions, positions, and lighting conditions, causing interruptions and error codes. Through adjustments in environmental control, particularly lighting, we addressed these challenges by trying to use external sources of light such as flashlights to prevent shadows from appearing in the camera, ensuring the vision system's accuracy in identifying essential components like the latch bolt for the pneumatic vise. The project illustrates the practicality and advantages of incorporating sophisticated robotic systems into manufacturing, offering a model for SMEs to access automation technology affordably and efficiently. The successful implementation and fine-tuning of the robotic operation not only showcase the project's technical successes but also the potential to elevate productivity and competitive edge within the industry. The broader implications for SMEs and the manufacturing sector suggest a scalable model for future automation projects. Potential future directions include exploring additional applications for robotic automation in manufacturing and further research to enhance integration techniques.

Cost Effective Vibration Table

Dermot Warner, Sean O'Hara, Ryan Fitzpatrick

Faculty Mentor: Andrew Judge

School of Engineering & Computing

Booth: 129

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the NASA CT Space Grant Consortium Grants Expo

This research was supported by the INSPIRE Award, the Science Institute, and the Hardiman Scholars Fund

Abstract:

This research project sets out to develop an affordable vibration table tailored for K-12 classrooms and University labs, with a primary focus on testing component resilience under mechanical vibrations. A pivotal challenge lies in the design of this table utilizing readily accessible components while ensuring compliance with MIL-STD-810 standards. These military standards specify the environmental engineering considerations and laboratory tests that mimic the effects of environments on equipment, ensuring durability and robustness. Objectives extend to the simulation of mechanical vibrations, the evaluation of diverse materials, and the support of design development, all under MIL-STD-810.

Predictive Analysis For Patient Engagement

Daniel Russo, Ian Austin, Ruhuan Liao

Faculty Mentor: Dr. Sidike Paheding

School of Engineering & Computing

Booth: 130

This research is affiliated with the Engineering Senior Design Team

This research was also presented at the American Society For Engineering Education NorthEast Section

Abstract:

Predictive Analysis For Patient Engagement In collaboration with Pursue Care, an online addiction and mental health treatment provider, we are creating an AI predictive algorithm that provides patient managers with a more accurate day-to-day view of their patient's recovery journey. Through our prediction, we can identify which patients may need additional contact with their patient managers to ensure they maintain good recovery practices and attend scheduled appointments. This provides patients of Pursue Care additional support in their recovery journey and allows patient managers to spend their time more efficiently with the patients who need it the most. This increased interaction rate between struggling patients and their patient managers will hopefully yield a higher number of patients finishing recovery. We leveraged SQL to extract patient data from the Pursue Care database. Utilized Python to clean the data and experiment with different AI models. We explored options such as linear regression, logistic regression, and random forest to determine which gave us the most accurate prediction for patient dropout rate.

SESSION 3

Egan School of Nursing and Health Studies Capstone Projects

- ◆ Nursing Capstone Projects
- ◆ Graduate Student Projects

End-of-Life Conversations With Pediatric Oncology Patients

Autumn Arel

Faculty Mentor: Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 1

Abstract:

When confronted with pediatric end-of-life discussions, healthcare providers and parents/guardians often dominate the conversation at the expense of dismissing the child. There are many reasons why pediatric patients are not always involved, including a sense of needing to “protect” the child from their diagnosis and a lack of education on this topic. However, research has demonstrated the interest of children in being involved in these discussions, with the ability to ask questions. Avoiding these difficult conversations can create fear and misunderstandings. This learning needs project examines six articles, at varying levels of evidence, related to communication strategies for end-of-life conversations with pediatric patients. An infographic, in conjunction with the presentation, includes information on evidence-based communication strategies and the benefits of engaging pediatric populations in these conversations. It is the hope that these guidelines will be a starting point for pediatric oncology nurses to engage in end-of-life discussions with their patients.

The Importance of ED Nurses Utilizing Teach-back Communication When Providing Discharge Instructions

Kaitlin Bailey

Faculty Mentor: Hannah Zhang

Egan School of Nursing & Health Studies

Booth: 2

Abstract:

The emergency department is a fast-paced, overcrowded environment where patients are quickly treated and discharged. The majority of patients are sent home following their emergency visit with the responsibility of coordinating their own care. Discharge is a crucial time where education and clarity must be provided for patient safety. Through observation in an urban emergency department, I identified the need for a more thorough and comprehensive discharge method. Discharge education is often too vague or misunderstood by the patients which results in adverse events, readmissions and increased healthcare costs. Studies have found that nearly 27% of readmissions are preventable (Luther et al, 2019). Evidence based research has proven teach-back communication to be the most effective and cost efficient way to decrease readmission (Talevski et al, 2020). To cultivate change in this emergency room, I created a discharge checklist for ED nurses to use that facilitates teach-back communication. Identifying misunderstandings and providing clear instructions at discharge is essential for patient safety, continuity of care and to decrease preventable readmissions.

Who, What, Why, How: Ethics Committees

Grace Baker

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 3

Abstract:

Ethics committees are interdisciplinary groups of healthcare professionals that can be consulted in the case of a care team identifying an ethical issue. These committees are proven to be beneficial not only to the patients but also to the professionals who request their consults. Regardless of the kind of unit that nurses work on they will inevitably encounter ethical issues. In fact, nearly all nurses report that they have faced ethical dilemmas while at work, however, very infrequently are ethics consults requested. There are many reasons that nurses, or healthcare professionals in general, do not request ethics consults, but one primary reason that these referrals do not occur is because of a lack of education on what ethics committees can do, or what to expect when consults occur. This project helps nurses to identify ethical issues that could require a consult and prepares nurses for what is involved in an ethics consult.

Importance of Oral Care in the Pediatric ICU to Prevent Ventilator Associated Pneumonia

Caroline Baldwin

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 4

Abstract:

This project is based upon the need to provide oral care in order to decrease the occurrence of Ventilator-Associated Pneumonia (VAP) in the PICU. The studied population were nurses working in an 18+ bed PICU at a large, urban children's hospital in the Northeast. An extensive literature review was conducted, concluding that frequent oral care on ventilated patients significantly decreases their risk of acquiring VAP. An infographic outlining the hospital's oral care policy and the importance of preventing VAP in ventilated patients was created. The infographic was handed out to staff nurses at a floor meeting, and posted on the bulletin board in the break room accessible to all. Further research should be conducted regarding oral care frequency in neonatal PICU patients compared to toddler, school-aged, and adolescent PICU patients.

The Importance of Oral Hygiene in Stroke Survivors

Abigail Barth

Faculty Mentor: Cara Tietjen

Egan School of Nursing & Health Studies

Booth: 5

Abstract:

Oral care is a crucial but often neglected routine in the hospital setting. There is a great need for further education on the importance of oral care in hospital settings, particularly for those suffering from strokes. While observing stroke patients as they recover in the neurology unit in a not-for-profit hospital, it is evident that strokes can disrupt oral hygiene routines due to functional impairments they may cause. The evidence-based literature presented in this capstone project reveals that stroke survivors with or without functional impairments should maintain good oral hygiene to decrease the risk of complications, such as pneumonia. The relationship between oral care and post-stroke complications emphasizes how we should educate the stroke population and their caregivers on this matter. This capstone project aims to spread awareness to patients and families on the pivotal role of oral care in the primordial prevention of post-stroke complications. The project incorporates an infographic to educate stroke survivors, which may improve oral care routines and reduce the development of post-stroke complications.

Preventing Self-Extubation in ICU Patients Without the Use of Restraints

Lauren Basso

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 6

Abstract:

The use of physical restraints to prevent self-extubation, or the act of forcefully removing one's own endotracheal tube, is common practice in many Intensive Care Units (Selvan, 2014). However, research shows that the use of physical restraints in preventing self-extubations is ineffective, and that their use may actually increase the risk of self-extubations (Berger et al., 2023). In the ICU of a mid-sized urban hospital, I observed that there was no readily-available information on this topic, and that the use of physical restraints with intubated patients was considered standard practice. The purpose of this Capstone Project is to introduce comprehensive interventions that prevent self-extubations in ICU patients without the use of physical restraints. An infographic naming four interventions - pain management, adequate sedation, one to one monitoring, and improving communication - was developed to be displayed and disseminated amongst the ICU staff nurses, helping to improve intubated patient outcomes and safety on that floor.

The Impact of Topical Pain Management with Phlebotomy in Pediatric Patients

Kathryn Bergstrom

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 7

Abstract:

Phlebotomy procedures in pediatric patients often include pain and distress, which can have negative implications for patient care and experience. Topical pain management has emerged as a potential strategy to alleviate discomfort during phlebotomy in this population. This project aims to assess the impact of topical pain management on pain perception and patient experience during phlebotomy procedures in pediatric patients. Throughout the research, studies demonstrated a significant decrease in pain scores and procedural outcomes with the use of topical pain relief methods. Additionally, topical pain management is associated with patient cooperation, reduced needle-related anxiety, and improved overall patient experience. Incorporating these methods into clinical practice contributes to the overall patient experience.

The Importance of Post- Stroke Clients Understanding the Multidisciplinary Team

Ciara Berutti

Faculty Mentor: Cara Tietjen

Egan School of Nursing & Health Studies

Booth: 8

Abstract:

Post- stroke clients often deal with cognitive decline, resulting in trouble remembering the differences between their doctors, nurses, and therapists. Lack of knowledge of one's multidisciplinary care team may lead to patient misunderstanding, avoidable adverse effects, and can affect the ways in which clients care for themselves upon discharge. Lack of patient information materials is a large contributing factor to the lack of stroke patient information (Alegiani, et. al., 2020). Infographics can act as a visualization tool in order to change the ways in which patients understand who is caring for them and why. An infographic has been created for post- stroke clients in the acute care setting, in order for them to easily access information on which provider will be seeing them, as well as what their roles are based on the patient's specific healthcare needs.

Implementing Psychosocial Care on Inpatient Medical-Surgical and Oncology Units

Alexandra Bochner

Faculty Mentor: Mary Anne Caserta

Egan School of Nursing & Health Studies

Booth: 9

Abstract:

In inpatient medical-surgical and oncology units of hospitals, where patients have complicated disease processes and comorbidities, psychosocial care is often neglected. Nurses often focus on providing the necessary physical treatment, and it can be difficult to find time to address how the patient is coping with their disease, how their mental health is being managed, and if they have the necessary support in place. However, these factors are also important in treating the patient as a whole person, as psychosocial factors can complicate how the individual manages their disease and adheres to their treatment. This review utilized seven sources to further analyze how psychosocial care is provided in inpatient units, as well as interventions that can be performed to improve patient outcomes by looking at the whole person rather than solely the disease process. The literature highlights that nurses often don't feel they have the capability to provide adequate psychosocial care on top of medical care for patients with oncology diagnosis, and there is a need for nurses to change their personal perceptions and acquire the necessary knowledge to provide care to the person in addition to their disease. By removing these barriers, improved overall quality of care will be provided to patients during and beyond their hospital admission. Keywords: psychosocial care, oncology units, medical surgical units, total patient care

The Benefits of Maximizing Your Child's Meals While in the Hospital

Elizabeth Brewer

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 10

Abstract:

In hospitals, nutritious meals seem to be one of the first things that get overlooked. There is no one providing suggestions to patients regarding what to order for meals to improve their health, and many parents do not know the facts on choosing an appropriate diet for their child. Research on this issue emphasizes the importance of different food groups or diets for different diagnoses. There is no one-size-fits-all in nutrition, but with the help of this flyer and hospital teaching, parents can then make an educated decision when picking and choosing their children's food during hospital stay. An extensive literature review was completed that showed two main points: one, that nutrition is vital during hospital stays and the healing process, and two, that nutrition should be utilized to decrease risks of exacerbations of disease or prevent disease from developing at all. Whether it's implementing a low-sodium diet for a kidney condition, high protein for post-op, or a plant-based diet to improve lung function, it is clear nutrition plays a big role in improving the health statuses of patients.

The Importance of Adequate Discharge Education for Pediatric Patients

Cassandra Burton

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 11

Abstract:

This project explores the need for nursing staff to provide appropriate discharge education to create an optimal patient transition to home. Discharge education for families that have children requiring at-home medical needs must be clear and consistent. This capstone project focuses on a small pediatric unit with quick patient turnovers at a large urban hospital. With a high volume of discharges and admissions, some patients require parent-provided care at home. The literature review performed showed the connection between organized, innovative, and collaborative educational tools and fewer hospital readmissions. An infographic outlining the importance of discharge education for pediatric patient families was given to nurses on the unit. In order to safely discharge pediatric patients, their parents must be adequately informed. Additional research on how to optimize discharge teaching is necessary.

CLABSI Prevention in Critical Care

Sara Caceres

Faculty Mentor: Dr. Christopher R. Lacerenza

Egan School of Nursing & Health Studies

Booth: 12

Abstract:

In the ICU, Central lines are commonly used for hemodynamic monitoring, administration of nutrition, fluids, and medications that can be damaging to peripheral veins. While these lines are beneficial to healthcare providers as they navigate care to critically ill patients, unfortunately, these invasive lines pose a significant risk for infection. Central Line Associated Bloodstream Infections (CLABSI) are defined as laboratory confirmed bloodstream infections that occur 48 hours after initial placement of a central line and cannot be related to any other infection that the patient might have. Nurses on a Surgical ICU have identified gaps in managing central lines. Overall, it has been gathered that there is a general lack of knowledge on how to prevent CLABSI's despite there being ample amount of evidence to support the efficacy of CLABSI prevention bundles in reducing CLABSI rates. This project aims to serve as a reminder for nurses of all that must be done to protect patients from acquiring these detrimental infections.

The Importance of Implementing Palliative Care into Oncology Nursing

Kristen Cadge

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 13

Abstract:

Receiving a cancer diagnosis can cause a range of different emotions. As nurses, it is our job to provide the best care to our patients and educate them on all available resources. Palliative care is specialized medical care available to provide relief to people living with a serious illness. It is often used in oncology nursing to provide patients with a better quality of life. Although early integration of palliative care is discussed with oncology patients, it is rarely seen achieved. When palliative care is implemented at the beginning of a patient's diagnosis, this will help the oncology patient experience less pain and troubling symptoms, therefore leading to a better quality of life. While observing oncology patients during clinical, I quickly realized the need for education on palliative care. The evidence-based literature presented in this capstone project highlights the types of palliative care and how they benefit oncology patients when implemented. Some of these benefits for patients include relieving pain, improving mood, reducing anxiety and depression, supporting patients and families, and helping patients make important decisions about their care. Along with the research presentation, an infographic was created to easily display the importance of palliative care on one page. This infographic can be used as a tool for oncology patients to learn more about palliative care.

The Benefits of Empowering Hospitalized Oncology Patients to Become Self-Advocates for Quality Sleep

Anna Cahalan

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 14

Abstract:

Although sleep plays an essential role in healing, it is often neglected in the hospital setting. Pain, light, noise, and frequent interruptions by staff commonly contribute to poor sleep. Sleep deprivation can have deleterious effects, prolonging recovery by diminishing immune function, wound healing, and metabolism and increasing the risk for delirium and depression. A sub-optimal sleep environment poses a particular threat to oncology patients who already experience sleep problems at double the rate of the general population. While many oncology patients in my clinical experience endorsed sleep problems and fatigue, sleep hygiene resources were rarely utilized. These findings highlighted a patient knowledge deficit regarding available sleep promotion resources. Guided by research supporting the effectiveness of sleep hygiene education and patient activation interventions, I created a sleep hygiene infographic that empowers oncology patients with the necessary knowledge to become self-advocates for their individual sleep needs during and after hospitalization.

The Benefits of Non-pharmacologic Interventions During Labor

Bailey Cahill

Faculty Mentor: Stephanie Caicedo

Egan School of Nursing & Health Studies

Booth: 15

Abstract:

Many women face anxiety and fears as they approach labor and motherhood. Stress has been found to have a direct link to negative experiences in labor. Literature suggests that 20% of expecting mothers' fear, results in prolonged labor, cesarean deliveries, and poor maternal mental health (Fairbrother et al., 2022). Expecting mothers need to be presented with resources and support to address the negative stigma of childbirth. Education from the medical team needs to commence at admission to reduce fear and anxiety. Currently, mothers are only educated on pharmacological methods during labor. However, nonpharmacologic methods are minimally invasive, inexpensive, and highly accepted by patients (Lin et al., 2019). The evidence-based literature outlined in this capstone project highlights five nonpharmacologic methods used during labor that have presented positive outcomes. Additionally, an infographic was created to educate the staff and patients on the use of these methods and their benefits.

Empowering Patients: Understanding and Accessing Medical Interpretation Resources in the Emergency Department

Madelyn Cardenas

Faculty Mentor: Stephanie Caicedo

Egan School of Nursing & Health Studies

Booth: 16

Abstract:

As society continues to progress and diversify, the healthcare system must also evolve to improve patient care. The evolution of healthcare systems requires comprehensive holistic services that address the constant changes in patients' population. During my clinical rotation in the Emergency Department, a deficiency in usage of interpreter devices was noted. Many nurses would rely on their "basic proficiency literacy" to provide direct patient care. Given these discrepancies, my capstone project focuses on the importance of using professional medical interpreter services, as well as providing culturally and linguistically competent care. The infographic highlights key information such as how to request an interpreter and the importance of clear communication in emergency situations for limited English proficient patients. Through the implementation of this visual aid, it seeks to empower patients by improving their awareness and access to interpretation services, resulting in enhancing communication as well as patient outcomes.

The Importance of Nutrition Screening Tools and Assessments for Pediatric Hematology and Oncology Patients.

Megan Caro

Faculty Mentor: Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 17

Abstract:

Pediatric hematology and oncology patients are at much higher risk for developing nutritional problems related to their underlying disease and as a side effect of their treatments. Nutritional status is a modifiable factor that can be intervened upon (Pedretti et al., 2023). Monitoring the nutritional status of children with cancer is essential and many centers have found that nutritional assessment is very important in clinical practice; however, believe it is only implemented in practice at an intermediate level (Venturelli et al., 2024). While on a pediatric hematology and oncology unit, there was a learning need surrounding the importance of thorough nutritional assessment in this population. In order to improve education for nurses, an infographic was created regarding the impact of nutritional screening on pediatric hematology/oncology patients. This tool aims to increase the frequency and thoroughness of nutrition screening and improve overall nutrition status and therefore improve patient outcomes.

The Importance of Patient Education Regarding CT Diagnostic Testing in the Emergency Department.

Margaret Carolan

Faculty Mentor: Dr. Christopher R. Lacerenza

Egan School of Nursing & Health Studies

Booth: 18

Abstract:

Anxieties and fears of the unknown in emergency settings, especially surrounding claustrophobia associated with computed tomography (CT) scans, often are accompanied by decreased patient compliance. When necessary scans required to construct a diagnosis and treatment plan are delayed due to patient fear and insufficient understanding, unfavorable patient outcomes arise. Many patients lack knowledge about the entities regarding CT scans, ultimately escalating anxiety and reluctance. Through comprehensive and simplistic teaching on the purpose and process of CT scans, patients can exhibit feelings of comfort and empowerment undergoing the scan. CT compliance not only expedites diagnosis, but increases the probability of accurate diagnosis and proper treatment. This project examines how effective education can assist patients in alleviating fears, enhancing their knowledge, and facilitating informed decisions, ultimately improving outcomes in emergency settings. By implementing an infographic with key information concerning CT scans, these patient-centered difficulties can be combated while enhancing efficacy and compliance.

Importance of Nurse Education on Proper Ostomy Care

Daniela Casale

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 19

Abstract:

It is common for nurses working on medical-surgical hospital units to experience working with a patient that have a bowel or bladder diversion, such as a colostomy or an ileostomy . Improper care of peristomal skin and ostomy bag can cause complications; leakage and skin irritation being the two most common. These complications can lead to a decrease in quality of life and psychosocial issues related to the stoma. Nurses caring for patients with a stoma need to understand not only on the types of stoma appliances available, but also on the use of stoma care accessory items such as skin barriers and adhesive removers. It's crucial for nurses to correctly perform stoma care in the healthcare setting to prevent the occurrence of these complications.

Caregiver Strain and Its Impact on Physical and Mental Health

Grace Cassella

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 20

Abstract:

Caregiving is a selfless act of service that 100 million U.S. adults provide, and caregiver strain affects 44 million people in the U.S. This strain often leads to mental and physical health issues such as anxiety, depression, chronic fatigue, and chronic conditions such as heart disease. Without addressing this issue, caregivers and their care recipients face decreased quality of life. Definition, recognition, and intervention of this issue are essential for this population, especially as the number of caregivers in the U.S. continues to rise. Teaching tools such as the one featured in this project can do just that. While observing the Medical Surgical/Oncology unit at a local hospital, it was evident that many caregivers of patients on the unit face caregiver strain. With the majority of the patients on this unit being of advanced age, and with many facing serious and terminal diagnoses, caregivers are very involved. There is a need for education on what caregiver strain is, how to recognize it in oneself or one's family member, and a need for resources for this population. The evidence-based literature presented and incorporated in this project addresses the impacts of caregiver stress and strain on physical and mental health, as well as provides some suggestions on how we can address this issue. A brochure was created targeted at caregivers themselves as well as their family members, providing information on the topic and resources that may be of help to them.

Pediatric Fever Management in the Emergency Department

Julia Cavallo

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 21

Abstract:

In the Pediatric Emergency Department, many triaged children presented with a chief complaint of a fever, sometimes with additional accompanying symptoms. Parental anxiety surrounding fevers is the primary cause for many ED visits and phone calls to doctors requesting medical attention and advice (Crapser, N.T. et al., 2023). Parents would benefit from learning strategies to manage their child's fever successfully. Implementing a guide for parents to follow will help further support the care of their febrile child and aid them in understanding when to reach out for additional medical attention. While in the Pediatric Emergency Department, a learning need was identified surrounding education for pediatric fever management for the parent population. To meet this need, an infographic was created with tools to increase parents' confidence in their ability to recognize, treat, and assess their child when they present with signs and symptoms of a fever.

The Importance of Pain Management for End-of-Life Care

Lauren Cederholm

Faculty Mentor: Clare Hagedus

Egan School of Nursing & Health Studies

Booth: 22

Abstract:

There has been an increase of patients in hospice care requiring various services. When a patient reaches end-of-life they experience numerous symptoms causing discomfort and pain. Therefore, one of the most important services included is pain management. Pain management is important in ensuring comfort overall increasing the patient's quality of life. Families continue to be vulnerable to misconceptions of pain management and the plan of care for their loved ones as they lack the understanding necessary in their involvement of the dying patient's care. While observing the patients on the oncology unit of a medium sized hospital it was evident that many of the patients were receiving end-of-life care. It was also evident that the families continued to ask questions and were left confused after the patient had received care throughout their stay at the hospital. Overall, there is an increased need to educate the families on the pain management regimen as it would better support the patient. It is evident in the research that the families lack the knowledge to properly support their loved ones at end-of-life. In connection to the research presentation, an infographic was created for the patients' families that includes easy to read information about pain management increasing both their understanding and involvement in their loved one's care.

The Importance of Medication Education in Post-Operative Patients

Elizabeth Corr

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 23

Abstract:

The postoperative period for a patient involves abrupt changes in their lifestyle and wellbeing. Patients are faced with new challenges and have to put an immense amount of effort into completing tasks during their daily life that once were simple for them. Getting over these physical hurdles and adjusting to their new normal is almost always as difficult as it sounds, so when the patient also has to self-administer new medications, it can become overwhelming and oftentimes shoved to the side. But, this can prove to be detrimental to the patient's health as it can cause issues to worsen, resulting in a readmission to the hospital due to lack of adherence to their medication regimen. Although this might have to do with the patient being overwhelmed with the recovery period, studies show that it may also be due to patients not being educated on what their medications do and the importance of taking them. While observing the General Surgery floor a local hospital in Connecticut, many patients admitted to not knowing what each of their medications was for and their order of importance. Other patients were admitted as a result of lack of adherence to their medications. In the nurses' plan of care, there is no outline of how and when to acknowledge the patient's education level on their medications. If educated, this will clearly improve the rate at which these patients adhere to their schedule. The evidence-based literature presented in this project explains the vitality of medication education. The purpose of the infographic I created is so call upon patients to adhere to their regimen as well as remind nurses to advance their care by ensuring this task is complete before discharge.

Preventing Infections: At-Home Education on Daily CHG Bathing for Pediatric Oncology Patients.

Margot Costa

Faculty Mentor: Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 24

Abstract:

CHG, an antiseptic able to reduce the risk of infection, which, if acquired, can be detrimental to a cancer patient. CHG bathing is performed with CHG wipes or foam with the said antiseptic. Pediatric oncology patients discharged to home with central lines are at higher risk for infection, hence why an antiseptic bath daily could make a world of difference. Through a literature review the importance of daily CHG bathing has been proven to lower infection rates in-patient and can be applicable to out-patient as well with proper adherence to discharge teaching. The infographic provided contains the information families need to complete CHG bathing at home. In conclusion, with use of the provided infographic, patients and families should implement CHG bathing daily at home for pediatric cancer patients in order to lower infection rates and prevent unnecessary readmission to the hospital.

The Importance of Safe Sleep Practice Education in the Hospital Setting

Lauren Crenshaw

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 25

Abstract:

There are approximately 3,500 sleep-related deaths among infants each year in the United States (AAP, 2023). Safe sleeping practices for infants are important to promoting their health and reducing the risk of Sudden Unexpected Infant Death Syndrome (SUIDS) and other sleep-related hazards. Education for parents in the hospital setting should promote safe behaviors that can be mirrored after discharge. This presentation investigates potential barriers to Safe Sleep Practice implementation and addresses the importance of parental education. By using current research and recommendations an infographic was created to distribute to postpartum patients and support persons.

Standardized Seizure Precautions in Patients Undergoing Alcohol Withdrawal

Caroline Crook

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 26

Abstract:

About 10% of symptomatic patients withdrawing from alcohol will experience potentially life-threatening seizures (Daly et. al 2022). Enhancing the safety of these patients is an integral part of their inpatient treatment. Despite the importance of seizure precautions in mitigating these risks, there is often variability in their implementation in hospital units. On a large med-surg floor in an urban hospital, there was no readily available information ensuring best practice recommendations for seizure precautions considering the high number of patients in acute alcohol withdrawal. An informational handout addressing proper safety measures for patients at risk for seizures and seizure-related injuries will aid in ensuring the hospital staff at large is educated on proper seizure precautions. There will need to be a re-evaluation to see if by standardizing seizure precautions and providing knowledge to staff on the unit, patient safety outcomes will improve.

Perioperative Prevention of Surgical Site Infection

Hannah Cross

Faculty Mentor: Lynn Massoia

Egan School of Nursing & Health Studies

Booth: 27

Abstract:

Surgical site infections (SSIs) create a significant healthcare challenge as they contribute to increased morbidity, prolonged hospital stays, and substantial healthcare costs (De Simone et al., 2020). During clinical it was evident not all perioperative nurses were following proper hand hygiene protocol. Consequently, it became clear that more information via visual aide could be useful to all aspects of perioperative nursing. An extensive literature review found that perioperative nurses can benefit from SSI prevention education as it significantly decreases SSI rates and increases patient safety. Perioperative nurse SSI education is important; as they engage in various environments that require them to practice continuous quality improvement initiatives, participate in audits and implement evidence-based practice to enhance infection prevention protocols. Future research could focus on assessing and exploring the role of technology in improving SSI prevention. This capstone emphasizes the importance of education for perioperative nurses and highlights interventions to prevent SSIs.

Nutrition at Your Fingertips

Sarah Cummings

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 28

Abstract:

While observing nursing staff on a general medical unit, dietary information could have been more efficiently accessed and delivered to patients. Nutrition is not always the nurse's priority, but it is essential to patient healing. Education on nutrition and hospital-specific diets within nursing licensure programs is insufficient. Nurses have many patients and tasks to juggle during their shifts. Time management is essential for patient care and safety. Instead of looking through online resources, reference cards can save nursing staff time while providing safe patient care and education. The proposed solution involves the implementation of hospital diet badge cards, which serve as a quick reference guide for nurses to make informed decisions regarding patient nutrition. With the creation of an easily accessible tool, i.e. a badge card, there should be an increase in nurse awareness of the important aspects of proper nutrition and patient outcomes.

Dietary Guidelines After an Ileostomy

Kathleen Curry

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 29

Abstract:

Life post-ileostomy can be jarring for some patients since they have to navigate stoma care, ostomy bag changes, and dietary health. Nutrition is a key factor in how patients can have a smooth adjustment to their new lifestyles, as what a patient eats can impact the consistency of their stool and how much output they have. The purpose of this project is to review literature to determine what foods are most tolerated by patients after an ileostomy so the information can then be distributed to patients to ease their transition, educate them on proper nutrition, and promote comfort. The information collected was then inserted into a handout that concisely states examples of foods patients can eat that may minimize negative side effects, such as loose, watery stool. This infographic can be distributed to those in both inpatient and outpatient settings and be used by a variety of different healthcare providers. With concrete information that is easily accessible, patients can receive a better education about what foods may be best for their ileostomy and what should be avoided, thus promoting better healing and improved quality of life.

The Benefits of Educating Expectant Mothers on the Role of Midwives During the Labor Process

Katelyn Czerniewski

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 30

Abstract:

For hundreds of years, midwives have played a pivotal role in caring for expectant mothers before, during, and after labor. Historically, they were commonly found assisting with home-births, supporting women and providing them with natural, homeopathic remedies to ease the pain and mental stress associated with childbirth. The professionalization of midwifery services began in the early twentieth century, where formal education and nationally regulated medical training programs were established, and midwives' scope of practice broadened to include inpatient clinical proficiencies. However, dated stereotypes about the traditional role of these individuals have resulted in the present underutilization of midwives in the United States and an overall lack of knowledge about their competencies. There continues to be a need for the provision of education about midwifery to all expectant mothers and an emphasis on the high-quality medical care they have the opportunity to receive. Midwives are influential in promoting family-centered care, prioritizing mothers' needs and feelings, performing necessary medical interventions, and providing parents with postpartum and newborn education. With the support of evidence-based literature, this project addresses the importance of informing patients on what midwives do, their proficiencies and the training they have received, and the services available on one's specific maternity unit.

Increasing Mobility on a Medicine Unit

Colleen Daghita

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 31

Abstract:

Promoting mobility among patients admitted to medicine units has gained significant attention in healthcare settings due to its positive impact on patient outcomes and healthcare delivery. The benefits associated with augmenting mobility on a medicine unit, focusing on improved patient recovery, reduced length of hospital stay, prevention of complications such as pressure ulcers and deep vein thrombosis, and enhanced overall quality of life. Through a comprehensive review of literature and evidence, this project underscores the critical role of mobility interventions in optimizing patient care and outlines the necessity for healthcare systems to prioritize initiatives aimed at patient mobility within medicine units. The visual aid created for the project aims to increase mobility on medicine unit.

Preoperative Education for Families of Common Cardiothoracic ICU Procedures

Elizabeth DeCrisanti

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 32

This research was also presented at National Student Nurses Association 2024 Annual Convention

Abstract:

In intensive care settings, time is often compromised and short. However, providing education on common ICU procedures can decrease stress and anxiety and improve overall satisfaction with care. Educational support for family members allows for an increase of trust in the intensive care team. Improving education methods for families will allow for the care team to have reliable education methods that reduce stress. Utilizing a handout allows families to have a physical form of education that allows for efficiency when discussing procedures and can reduce time being spent on educating when life-saving actions need to be carried out. The variables assessed were cardiothoracic ICU bedside procedures, education methods such as family discussions and home handouts, family education level, and readiness for learning. Literature reveals that handouts with pictures and videos increase health knowledge and make families feel more comfortable in ICU settings. Understanding how to improve family satisfaction will help care teams provide adequate information to maximize knowledge.

The Benefits to Educating Patients on Triage Systems in Emergency Departments

Julia Deeble

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 33

Abstract:

In recent years there has been an increasing utilization of emergency departments and as a result, there has been an influx in patient volume. As a result of more people seeking care from emergency departments, wait times have been increasing as well. Depending on how busy an emergency department is at a given time some patients may be waiting for hours at a time. These long wait times have proven to cause a lot of frustration among patients and in turn, decreased satisfaction with the care provided by emergency department providers. A lot of this frustration comes from a lack of understanding of triage systems and how emergency departments work. The purpose of the triage system is not to decrease wait times but to provide care to patients who need it promptly. While triage systems do decrease wait times for more critical patients, the patients with less pressing medical issues are the ones left to wait for hours at a time. These patients are typically the ones who experience frustration and dissatisfaction related to the care they receive. It is clear that there is a need for education regarding the role triage systems play in patient care and wait times in emergency departments. The goal of this project is to develop an educational guide on how triage systems work to increase patient understanding, and in turn, help alleviate some of the frustration experienced by wait times.

Prevention of Tumor Lysis Syndrome in Pediatric Oncology Patients

Charlotte Delmonico

Faculty Mentor: Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 34

Abstract:

Tumor Lysis Syndrome (TLS) is a pediatric oncologic emergency that necessitates comprehensive patient and family education. This project addresses the learning need identified among pediatric oncology patients and families regarding the nursing interventions for TLS prevention on a Pediatric Hematology/Oncology unit. Through the development of an educational infographic, the project aims to empower patients and families with knowledge to improve their ability to actively participate in their care. Evidence demonstrates that the incidence of TLS in the pediatric population can range from 4.4% to 53.6% (Bozkurt et al., 2024). Due to its unpredictability, protocols like hydration therapy, frequent laboratory monitoring, and prophylactic hypouricemic medications are paramount in preventing this dangerous complication (Larson & Pui, 2024). Providing clear explanations of these nursing interventions is imperative in mitigating their already heightened levels of stress. Increased knowledge furthermore enables early detection and intervention, reducing the likelihood of severe TLS-related complications.

Education on Neutropenia Management for Oncology Patients

Julia Di Biase

Faculty Mentor: Elsie Hernandez

Egan School of Nursing & Health Studies

Booth: 35

Abstract:

Neutropenia is a common complication of oncology treatment that increases the risk of serious infection. This occurs when there is an abnormally low level of neutrophils, a type of white blood cell (leukocyte), that play a crucial role in the body's immune response. Oncology treatments such as chemotherapy and radiation therapy may decrease the amount of these blood cells to a dangerously low level causing neutropenia. This capstone project focuses on the importance of patient education and aims to develop and implement an educational tool for neutropenia management in oncology patients. This tool will use simple terms to outline what neutropenia is, what causes it, when to initiate neutropenic precautions, what to report to a provider and the do's and don'ts of neutropenic management. This will be done through an infographic, accessible non-virtually or virtually through a hard copy or QR code.

Early Integration of Palliative Care for Patients Living with Serious Illnesses

Catherine Dolan

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 36

Abstract:

This project addresses the need for early integration of palliative care among all medical care providers to enhance patient and family understanding and decision-making. Medical professionals must recognize the importance of discussing palliative care before patients reach critical stages of their illnesses. This project focuses on implementing strategies to initiate conversations promptly and effectively. Through conversation with healthcare professionals and thorough review of the literature, it became clear that early palliative care improves patient outcomes, including symptom management, psychological well-being, and survival rates. Conversely, late referrals to palliative care are common due to various barriers including misconceptions about palliative care and limited availability to specialized palliative care teams. As a solution to these challenges, the project suggests distributing informational flyers to patients and their families at primary care offices or hospitals upon diagnosis of serious illness. The flyers outline what palliative care is, who is eligible and the benefits of early integration. By promoting early discussions and integrating palliative care into routine care, patients and families can make informed decisions, alleviate symptoms, and enhance overall quality of life.

Spiritual Care in Healthcare: Empowering Nurses to Embrace a Holistic Approach

Norah Dreher

Faculty Mentor: Majeda Basilio

Egan School of Nursing & Health Studies

Booth: 37

Abstract:

Hospital-based chaplain services originated in the 1920s to focus on providing spiritual care to patients in the inpatient setting (Toates & Hickey, 2023). Spiritual Care, also known as pastoral care or chaplaincy can be defined in different ways. However, the overall goal throughout is to provide a supportive, compassionate presence for people during times of transition, illness, grief or loss, most often delivered through attentive and reflective listening in order to identify the person's personal spiritual preferences, hopes, and needs (Gardner et al., 2020). Nurses and healthcare providers play a very crucial role in addressing the spiritual needs of patients alongside their families and chaplains. However, research shows a gap in holistic care, as the spiritual aspect often gets overlooked. This overlook stems from many barriers such as lack of education and training in spiritual care for the healthcare professionals, lack of collaboration among healthcare professionals, heavy workloads and time constraints, fear of patient discomfort, ethical concerns, and reluctance to engage in spiritual discussions due to personal beliefs (Farahani et al., 2019). The evidence-based literature that is provided in this learning need project will portray the importance and need to educate nurses on the spiritual care services at hospitals. This information will also show how the spiritual care team's involvement in the healthcare interdisciplinary team is crucial in improving patients' and families' satisfaction with their clinical care, as well as increasing the patients' perceived quality of life and health outcomes.

The Impact of Operating Room Music on Surgical Teams' Performance

Miriam Dupree

Faculty Mentor: Lynn Massoia

Egan School of Nursing & Health Studies

Booth: 38

This research was also presented at National Student Nurses Association Conference

Abstract:

Attending to the emotions and environment of the entire healthcare team in operating rooms is imperative to the team's performance throughout the procedure. Studies have shown that playing music during procedures in operating rooms triggers the parasympathetic nervous system, allowing for the human body to relax, thereby leading to decreased heart rate and systolic and diastolic blood pressures (Yetasook, et al, 2021). While this relaxation positively affects patients, it also positively impacts the entire healthcare team, including nurses, surgeons, and anesthesiologists. Importantly, listening to music during operating room procedures decreases the mental workload, stress, and anxiety in surgical team members (George, et al, 2011). Intraoperative team members have experienced improvements in concentration during procedures when music is playing. Specifically, concentration is improved when Mozart's classical music, or music that is familiar to the surgical team is being played (Makama, et al, 2010). The music has the most impact when played between 55-60 decibels (Tseng, et al, 2022). Overall, the low cost intervention of having music playing in the operating room has positive impacts on both patients and the healthcare team. Specifically, providers benefit from decreased anxiety, which over time can lead to a decline in healthcare provider and nurse burnout (Rogers, et al, 2019). For patients, the literature supports that patient outcomes are improved when music is playing (Makama, et al, 2010). During the semester, time was spent in clinical experiences in operating rooms that did not have a standardized protocol for music during surgical procedures. This project focuses on educating the nurse on the benefits of playing music in the operating room and how this low cost, and easy to use intervention can be implemented onto the unit.

Motivational Brochure For Initiating Treatment For Alcohol Associated Liver Disease

Abigail Enright

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 39

Abstract:

Alcohol is the most commonly misused substance among Veterans. Alcohol Use Disorder is associated with liver disease and can severely impact one's lifestyle. AUD is linked to poor coping mechanisms and development of mental illness after transitioning back to civilian life (Dworkin, 2018). Many Veterans are young, have children and have so much life to live. It is important to educate Veterans about permanent damage to their livers due to AUD, as well as initiating motivation and preventing further damage to increase life expectancy. Details are provided on the effect of Alcohol Associated Liver Disease (ALD). An evidence-based brochure was developed to provide Veterans with information about AUD. Details cover the effects of alcohol on the liver, mental health resources, ALD, and the activity to create goals with the nurse during hospital stay so the patient feels motivated to abstain from alcohol at home. Providing evidence-based information to Veterans prior to discharge may bridge a gap between hospital based support and community care. Motivational interviewing is a therapeutic technique used by nurses to encourage patients to make choices that align with their self inflicted goals (Ramkissoon, 2022). With the proper education and support, patients have the opportunity to save their livers and avoid the negative impact of relapsing on themselves and their families.

The Importance of Parental Education on Infant Safe Sleep Practices

Julianna Estatico

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 40

Abstract:

The infant mortality rate is substantially high in the United States. Accidental suffocation and strangulation in bed accounts for a large portion of the rates of sudden unexpected infant death (SUID). Parents and guardians of newborns have a pivotal opportunity to receive education during their time spent after childbirth on the postpartum unit. Support and effective education regarding safe infant care is crucial for all parents and caregivers, and postpartum nurses have the responsibility to provide comprehensive patient education. Although patients receive safety education upon admission to the postpartum unit, the retention of the information provided is hindered by the overwhelming experience of going through labor and childbirth. Parents might be unaware of current, updated information on infant safe sleep practices. Giving patients access to educational materials, such as an infant safe sleep handout, enables learning and reviewing of information at an individualized pace. In addition to safety education upon admission, providing parental education on safe sleep through multimodal learning tools will help to increase the adherence to safe sleep practices upon discharge.

Education on Continuous Subcutaneous Insulin Infusion Therapy for Nurses

Paige Evans

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 41

Abstract:

Type 1 Diabetes (T1DM) is an autoimmune disorder that targets the beta cells located in the pancreas, responsible for producing insulin. Treatment for T1DM is supplemental insulin administered via injections throughout the day or by continuous subcutaneous insulin infusion therapy (CSII). A CSII is a device worn daily that delivers insulin into the body, helping to regulate blood glucose levels. Currently, over 300,000 Americans rely on CSII therapy to manage their T1DM. During rotations on an abdominal surgery floor at a private hospital, it was noted that some nurses had a comprehensive understanding of CSII functionality. Evidence-based literature utilized in this project highlights the benefits, applications, and the crucial role nurses play in managing CSII therapy. Research indicated that CSII therapy is more effective in reducing hemoglobin A1Cs than insulin injections (Lampe, 2023). Hence, maintaining patients on CSII therapy during hospitalization and equipping nurses with the knowledge to educate patients on CSII therapy is vital. As part of this capstone, an infographic was developed to provide background information on CSII therapy and its function, aimed at enhancing nurses' familiarity with this technology.

Combating Barriers to Breastfeeding in the Neonatal Intensive Care Unit

Julia Farah

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 42

Abstract:

Following childbirth, many mothers prioritize establishing breastfeeding as the primary method of nutritional support for their newborns. As of 2019, up to 83.2% of mothers worldwide initiated breastfeeding upon delivery, with 78.6% continuing to consume breast milk at one month (CDC 2022). However, Neonatal Intensive Care Unit (NICU) admissions have risen significantly in recent years, posing a challenge to breastfeeding initiation. Additionally, NICU admission “has been identified as a primary inhibiting factor in the establishment of breastfeeding” (Sokou et. al 2022). Thus, this combination underscores breastfeeding as a challenge for NICU parents that warrants attention. During my capstone experience on a Level III NICU, the need for educating parents on safe feeding practices to promote positive outcomes became evident, beyond the aforementioned broad statistics. This project will display information about breastfeeding NICU infants, barriers to breastfeeding for NICU patients, the benefits of breastfeeding, supplementary breastfeeding options, and the support systems for parents who choose to breastfeed their children.

Preventing Dehydration Related Complications After Bariatric Surgery: A New Approach to Patient Education

Sydney Fay

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 43

Abstract:

In recent years, bariatric surgery has emerged as a prominent solution for addressing obesity, with the laparoscopic sleeve gastrectomy (LSG) and the laparoscopic Roux-en-Y gastric bypass (LRYGB) being two commonly performed procedures. However, postoperative complications, particularly dehydration, remain significant concerns impacting patient outcomes. This capstone project aims to enhance patient education specifically targeted at mitigating dehydration-related complications following LSG and LRYGB. Despite the recognized importance of hydration post-surgery, many patients struggle to maintain adequate fluid intake, leading to dehydration-related emergency department (ED) visits and hospital readmissions. Through a comprehensive literature review, it has been established that noncompliance with postoperative instructions exacerbates this issue. Thus, this project proposes a novel approach to patient education, emphasizing early recognition of dehydration symptoms and practical strategies for achieving optimal fluid intake. The proposed intervention involves the development and distribution of a take-home 'hydration pamphlet' tailored to the needs of bariatric surgery patients. This pamphlet will provide clear guidance on recognizing dehydration symptoms, monitoring fluid intake, and implementing effective hydration strategies. By empowering patients with the knowledge and tools necessary to prevent dehydration, this project aims to reduce the incidence of dehydration-related complications and ultimately contribute to the overall success and safety of bariatric surgery.

The Importance of Bedside Shift Reports

Rachel Ferraro

Faculty Mentor: Stephanie Caicedo

Egan School of Nursing & Health Studies

Booth: 44

Abstract:

In order to maximize patient safety and promote proper continuity of care, all nurses should share pertinent patient information through bedside shift reports. The literature suggests that this level of safety results from the initial assessment a nurse makes regarding their patient. By doing a change-of-shift report at the bedside, the nursing team includes the patient in a discussion about their plan of care. During a clinical rotation on an urban hospital's infectious disease unit, it was noticed that the nurses were performing report in the hallway. The nursing staff expressed concerns about time constraints and HIPAA violations as reasons for not conducting bedside reports. In attempting to promote bedside report as the norm on this unit, a bedside shift report checklist was created for the nurses to utilize. This checklist enables focused areas of attention and facilitates comprehensive information sharing, which will help promote patient safety and positive patient outcomes.

Examining the Impact of Stress on Nurses in the Emergency Department: Exploring Relaxation Techniques

Lindsay Flores

Faculty Mentor: Hannah Zhang

Egan School of Nursing & Health Studies

Booth: 45

Abstract:

The emergency department presents a unique and challenging environment where nurses frequently encounter high levels of stress due to the demanding nature of patient care. This capstone project explores the intricate interplay between stress experienced by nurses in the emergency department and the utilization of relaxation techniques to foster resilience and enhance well-being. Through an extensive review of literature, this project elucidates the multifaceted nature of stressors encountered by emergency department nurses, ranging from high patient acuity and workload to emotional intensity and organizational constraints. Moreover, it explores the profound impact of prolonged stress on nurses' physical health, mental well-being, job satisfaction, and overall quality of patient care. This project endeavors to identify and evaluate a spectrum of relaxation techniques utilized by nursing professionals to alleviate stress and promote a therapeutic environment. These techniques encompass pharmacological interventions, such as mindfulness-based stress reduction, aromatherapy, and guided imagery, as well as non-pharmacological strategies like music therapy, massage therapy, and progressive muscle relaxation. By fostering a culture of resilience and self-care, healthcare organizations can support nurses in effectively managing stress, ultimately enhancing job satisfaction, retention rates, and the quality of patient care in the emergency department.

The Importance of Education in Managing Gestational Diabetes for Healthier Moms and Babies

Cally Flynn

Faculty Mentor: Clare Hagedus

Egan School of Nursing & Health Studies

Booth: 46

Abstract:

Gestational diabetes mellitus is a form of diabetes that a woman can develop during pregnancy. A diagnosis of GDM is made when the female's body is not able to make and use enough insulin or if hormones block the action of insulin causing resistance during pregnancy. There are two types of GDM: A1GDM which is diet controlled and managed without medication and A2GDM which utilizes medication to control glucose levels. If not treated properly, complications in pregnancy can arise. This condition can affect both mother and baby and potentially result in fetal death if not managed properly. Due to a lack of education and knowledge regarding this important matter, some pregnant mothers do not take the time or effort to effectively care for their GDM. This capstone project introduces an education tool to increase the knowledge of those who are gestational diabetics, to improve health outcomes for themselves and their unborn child. A clear and formal education tool on how to manage gestational diabetes, whether that be through taking insulin, making diet changes, exercising, etc., can decrease the risks and likelihood of complications for mom and baby.

Addressing Barriers to Medication Adherence in Transplant Patients

Daniella Fonseca

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 47

Abstract:

Transplantation is used to improve the life of patients with end-stage organ failure, however, optimal outcomes are reliant upon strict adherence to their prescribed medication regimen. There is an essential need for patients to adhere to their regimens, whether they have just recently received a transplant or received one year ago. On a transplant unit, Registered Nurses not only educate patients on their medications but on the importance of maintaining a strict regimen to promote maximum efficacy of the treatment. Non-adherence to immunosuppressive medication regimens is a significant challenge for transplant recipients, may increase risk of graft rejection and decrease the chance of long-term survival. Medication non-adherence is the result of barriers relating to financial constraints, complexity of regimen, lack of understanding, language barriers, and psychological factors. This project utilizes the incorporation of evidence-based literature within a patient checklist that can be provided on the unit to promote patient autonomy regarding their medication regimen.

Importance of Strictly Enforcing Neutropenic Precautions in Cancer Patients

Gianna Garofalo

Faculty Mentor: Mary Ann Caserta

Egan School of Nursing & Health Studies

Booth: 48

Abstract:

Cancer treatments, such as chemotherapy are both physically and mentally draining. Chemotherapy functions in the patient's body to eradicate cancer cells and prevent further malignancy; unfortunately, along with this, the powerful drug destroys healthy white blood cells (WBC), eventually resulting in abnormally low counts. This decreased level of WBC is referred to as neutropenia, which needs to be closely monitored in cancer patients. Neutrophils are an essential part of the immune system, acting as a defense against potential antigens entering the body. Post chemotherapy treatment patients are at a much higher risk of falling seriously ill to pathogens, that normally would not affect an intact immune system, due to the decreased neutrophil counts. Hence, when a neutropenic patient is febrile, it is considered an oncological emergency.

Education about neutropenic precautions is vital for patients, hospital visitors, and staff. While observing a Heme/Onc unit at a large urban hospital, many patients and their visitors are unaware of the neutropenic precautions that should be implemented due to a lack of nursing education. The hospital staff did a sufficient job of putting a noticeable sign on the door identifying a neutropenic patient, but was not as successful in enforcing these same precautions with visitors and hospital staff. The evidence-based literature presented in this project emphasizes why these precautions must be strictly followed and enforced. An infographic was created to be utilized as an educational tool for staff nurses on ways to implement neutropenic precautions effectively.

Strategies for Staff to Reorient the Older Adult Patient in the Acute Care Setting

Danielle Garofalo

Faculty Mentor: Dr. Christopher R. Lacerenza

Egan School of Nursing & Health Studies

Booth: 49

Abstract:

The acute care environment can pose an increased risk for delirium in older adults. Delirium can be a result from an unfamiliar environment with changing staff and constant sleep disturbances, overall negatively affecting the patient. Delirium can also be difficult for nursing staff to manage resulting in a greater incidence of burnout. According to evidence-based literature, non pharmacological management of an older adult in acute care is a first line treatment. This past semester working on an acute care unit, it was noted that staff struggle to approach patients in delirium and often use pharmacological intervention first. The goal of this learning need project was to educate staff on non pharmacological strategies to treat delirium on the unit.

Comparing Pharmacological Therapies Versus Mental Health Support Team Interventions for Suicidal Ideations in Older Males with Major Depressive Disorder: A Nursing Perspective

Alexis Gaulin

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 50

Abstract:

Major Depressive Disorder (MDD) is a prevalent mental health condition among older males, often associated with an increased risk of suicidal ideations. Pharmacological therapies and mental health support team interventions are commonly employed treatments for managing MDD and mitigating suicidal ideations in this demographic; however, the comparative effectiveness of these interventions remains uncertain, particularly concerning their impact on suicidal ideations. The researcher hypothesized that a collaborative modality of treatment is necessary. The objective for this learning need is to compare the effect of pharmacological therapies versus mental health team supportive interventions on suicidal ideations among older males diagnosed with MDD. A review of relevant literature, focusing on studies evaluating the effectiveness of each approach in managing suicidal ideations among older males with MDD, was conducted. The electronic databases of PubMed and CINAHL were searched. Data extraction and quality assessment were performed. Findings suggest that both pharmacological therapies as well as mental health team support interventions demonstrate efficacy in reducing suicidal ideations among older males with MDD. Selective serotonin reuptake inhibitors (SSRIs) have shown significant reductions in suicidal ideations. Similarly, mental health support team interventions, including cognitive-behavioral therapy (CBT), supportive therapy, and crisis intervention have been associated with decreased suicidal ideations. The comparative effectiveness between these two interventions remains inconclusive due to variations in study design, sample sizes, and outcome measures. In conclusion, nursing care for older males with MDD and suicidal ideations requires a comprehensive approach that integrates both pharmacological and mental health support team therapies. While both modalities demonstrate efficacy in reducing suicidal ideations, further research is warranted to determine the comparative effectiveness and optimal combinations of interventions. Nurses play a crucial role in the assessment, implementation, and monitoring of these interventions to ensure personalized and quality care for this vulnerable population.

Optimizing Postpartum Support: Utilizing the Edinburgh Postnatal Depression Scale

Morgan Gayton

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 51

Abstract:

Postpartum Depression (PPD) is gaining more attention as society begins to recognize mental health issues far more than in past generations. If PPD goes undiagnosed, there can be devastating consequences for mothers, as well as their infants. Nurses support mothers throughout, during, and even after their pregnancy, with education and guidance. For this capstone project, an emphasis was placed on the importance of nurses screening for PPD as soon as possible, but at least in the postpartum period before being discharged. During a senior capstone clinical experience, it was noted that staff nurses would benefit from education on PPD and screening tools. There was a lack of education for mothers being discharged, as well as a lack of awareness and identification. This project supports that the Edinburgh Postnatal Depression Scale is an essential tool for screening and, if their score is indicative of PPD, providing mothers with the next steps. An infographic was created for nurses to easily read and access the scale. It explains how to use the scale, why it's important, and additional education for nurses on the unit.

Signs and Symptoms of Respiratory Distress in Pediatric Patients

Alyssa Gehlmann

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 52

Abstract:

Respiratory distress is a serious and life-threatening condition, especially when it comes to the pediatric population. If not managed or treated accordingly, patients will develop acute respiratory distress syndrome (ARDS). ARDS can affect any age population and condition but typically correlates to a respiratory illness. According to the article, Acute Respiratory Distress Syndrome, ARDS is defined as the “sudden onset of noncardiogenic pulmonary edema, hypoxemia, and the need for mechanical ventilation” (Matthay et al., 2019).

While observing and participating in clinical sessions on a pediatric short-stay unit, several patients were admitted with difficulty breathing. The evidence-based literature presented in this project supports and addresses the early signs and symptoms that, if addressed at the onset, can prevent pediatric patients from developing ARDS. Early intervention and mechanical ventilation are the best therapies to avoid ARDS and protect the lungs (Emeriaud et al., 2023). An infographic was created alongside this capstone project to educate the nurses and various providers on the pediatric short-stay unit to identify respiratory distress signs and symptoms and the benefits of early intervention.

Keywords: Acute Respiratory Distress Syndrome (ARDS), signs and symptoms, distress, failure

Maximizing Health Benefits: Exclusive Breastfeeding versus Supplemental Feeding in the Immediate Postpartum Period

Gabriella Gizzo

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 53

Abstract:

The immediate postpartum period represents a critical phase in infant development, where nutritional choices profoundly impact short-term and long-term outcomes. However, many mothers often lack clarity on the best practices and the disparities in outcomes between exclusive and mixed feeding. Within the hospital setting, many mothers often supplement breastfeeding with formula after questioning adequacy and sufficiency of their breastmilk. This project aims to explore the specific advantages of exclusive breastfeeding compared to supplementary feedings during the immediate postpartum period. Through a comprehensive literature review and analysis of existing studies, this capstone project seeks to illuminate the health benefits for both infants and mothers, potential challenges, and the interventions to promote exclusive breastfeeding. This project culminates in the creation of an informative pamphlet that empowers new mothers at a small urban maternity unit and their families to make informed decisions regarding infant feeding practices. By presenting evidence-based information in a visually engaging and user-friendly manner, the pamphlet aims to contribute to improved health outcomes for infants and mothers alike.

Music Therapy for Pre-Operative Anxiety

Ciara Glaser

Faculty Mentor: Dr. Christopher R. Lacerenza

Egan School of Nursing & Health Studies

Booth: 54

Abstract:

During clinical rotation in the operating room (OR) of a local hospital in the winter of 2024, there was a notable prevalence of pre-operative anxiety among patients scheduled for surgery. This anxiety often stemmed from concerns about the surgical procedure itself or worries about being under anesthesia. Reflecting on this experience, the potential benefits of music therapy in alleviating pre-operative anxiety among OR/surgery patients were explored. Music therapy is widely recognized as a non-invasive intervention with the potential to reduce anxiety and promote relaxation in various healthcare settings. Based on evidence-based literature and firsthand observations, the effectiveness of music therapy interventions in easing pre-operative anxiety was assessed, aiming to enhance the overall surgical experience and improve patient outcomes.

Enhancing Step-Down Units' Strategies to Mitigate Hospital Readmissions

Christopher Gong

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 55

This research was also presented at National Student Nurses' Association 2024 Annual Convention

Abstract:

Step-down units play a crucial role in the continuum of care, facilitating the transition between the intensive care unit and general medical-surgical wards. However, the literature concerning SDU interventions specifically targeted at preventing ICU readmissions is scarce. This project seeks to synthesize existing evidence and propose actionable recommendations for enhancing SDU practices to mitigate ICU readmissions. By addressing contributing factors and implementing targeted interventions, SDUs can improve patient outcomes, lower healthcare costs, and elevate overall healthcare quality. Despite the challenges in estimating the impact of SDU admission due to inherent differences in patient acuity, leveraging SDU congestion as an instrumental variable offers insights into the effectiveness of SDU care in optimizing patient outcomes following ICU discharge (Lekwijit et al., 2020). Through a thorough examination of patient acuity, resource allocation, and care coordination in the step-down setting, this project seeks to bridge knowledge gaps and propose effective strategies for optimizing patient care and reducing readmission rates.

The Importance of Proper Nutrition During Chemotherapy Treatment

Alexandra Graeber

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 56

Abstract:

Cancer patients who are going through chemotherapy must face many negative side effects throughout the treatment process. Many of these side effects lead to inadequate food intake, making it challenging for these patients to get the proper nutrients and calories they need. Support from nurses is essential with this population, and therefore, nutritional intervention should be implemented as soon as possible. Patients need to be educated on their nutritional status and should be involved in creating an individualized care plan to reduce weight loss and maintain their caloric intake. While observing patients and staff on a busy Oncology floor, many patients were encouraged to eat, but seemed very hesitant and unmotivated. This capstone project examines evidence-based literature that highlights interventions to aid in increasing nutritional intake in chemotherapy patients. Some of these interventions include frequent high calorie meals, liquid supplements, oral hygiene, substances that improve the taste of food, and regular exercise to improve appetite. A handout was created for cancer patients and families to educate on these nutritional tips and bring awareness to this learning need.

The Effects of Rooming-In on Postpartum Fatigue

Gabrielle Grupenhof

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 57

Abstract:

When giving birth, rooming-in is defined as “keeping the mother and baby together in the same room after and during hospitalization” (Al-Shatnawi et al., 2021). Many hospitals are beginning to implement “baby-friendly” practices and persuade mothers to fully care for their newborns in their rooms during the postpartum period. Many believe that this time is crucial for parents to bond with their babies and learn how to care for them. However, this increased stress while recovering from birth can lead to high levels of postpartum fatigue, affecting both the mother and baby. Postpartum fatigue can disrupt family bonding, increase tension, and even lead to practicing unsafe sleep. (McRae et al., 2023). Many mothers feel that they are “abandoning” their babies when sending them to the nursery but don’t realize that it can actually promote a better family relationship. When mothers and fathers are more rested, they have stronger abilities to care for and learn all that comes with newborns. This project aims to educate mothers on postpartum fatigue and how sending their babies to the nursery during resting times can create a more positive birthing experience and strongly prepare families for bringing their newborns home.

Chemotherapy Precautions for the Caregiver

Avery Hannigan

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 58

Abstract:

Chemotherapy is a form of treatment that uses chemicals to kill fast growing cancerous cells in the body. According to the American Cancer Society, safety precautions must be in place for the first few days after treatment to prevent exposure (American Cancer Society, 2024). Chemotherapy comes with the risk of numerous side effects for the patient, however, many caregivers do not know they are at risk of being exposed to the toxins which can negatively impact their health. Exposure can occur in several ways such as coming in contact with bodily fluids or oral chemo treatments and equipment that has been contaminated. Poor adherence to chemotherapy precautions is the result of both a lack of knowledge as well as a perception of caregivers that their risk of exposure is unlikely and protection techniques are unnecessary. While on an Oncology Unit at a community hospital, it was observed that caregivers lack knowledge on the necessary precautions to take when caring for a patient receiving chemotherapy and an education tool was created to meet these needs. The tool informs caregivers of important information about chemotherapy precautions including how they may be exposed, the risks of exposure, how long to follow chemo precautions, what to do if exposed to the toxins and the necessary PPE and precautions to take. Caregivers including nurses, healthcare providers, family members, CNA's or other assistive personnel must be educated on and comply with the necessary chemotherapy precautions to take in order to maintain their safety from the hazardous toxins they are at risk of being exposed to.

Tumor Lysis Syndrome

Grace Harasimowicz

Faculty Mentor: Mary Anne Castera

Egan School of Nursing & Health Studies

Booth: 59

Abstract:

The purpose of this capstone project is to educate healthcare workers to be more aware about Tumor Lysis Syndrome. This is a complication of common oncologic treatments like chemo and leads to numerous electrolyte imbalances that in turn could cause acute kidney injury, arrhythmias and can even be fatal. (Adeyinka, 2022) Research has shown that greater awareness of this complication leads to quicker identification and therefore improve patient outcomes, making quick and accessible education the most valuable tool moving forward.

Effects of Aromatherapy for Oncology Patients Pain Management

Katherine Hauck

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 60

Abstract:

Chronic pain remains one of the most prevalent symptoms faced by cancer patients. It is often uncontrolled and reported as 'unbearable.' Pain can result from tumors, nerve damage, and long-term effects caused by treatments. These suffering patients deserve all the help they can get, including knowing all their pain management options. This project's evidence-based findings aim to show how effective aromatherapy is in cancer patients' pain and implement it in the oncology unit. Inhalation and massage aromatherapy are proven to reduce pain and other cancer-related symptoms if utilized consistently (İzgülü et al., 2019). A flier was created to be handed out for patients and their families to see what other symptom management options are available on the unit. Patients should know they have alternatives to long-term opioid use and the terrible side effects accompanied by them.

The Benefits of Early Ambulation for Postoperative Orthopedic Patients

Kate Hausmann

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 61

Abstract:

Patients undergoing orthopedic surgery face many obstacles in the postoperative period. Many patients fear that they will be unable to recover and regain the mobility and independence that they once had before. While observing and shadowing nurses on a Surgical unit in an urban hospital, many patients reported apprehension towards ambulation following their orthopedic surgery. Early ambulation after orthopedic surgery has many benefits including shorter hospital stays as well as improved outcomes and a reduction in complications. Increasing patient awareness on the importance of ambulation after orthopedic surgery can reduce apprehension and motivate patients to ambulate early in the postoperative period.

The Importance of Proper Lifting Techniques in Emergency Department Nurses

Andrew Holmes

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 62

Abstract:

Back injuries are the most common type of musculoskeletal injuries among health care workers, especially in the emergency department. Back injuries can be caused by numerous factors, including improper posture, bending and twisting at the waist, and lifting with your back muscles instead of with your legs. The consequences of back injury include increased healthcare costs, decreased quality care, employee dissatisfaction, and chronic pain. While observing at my transition clinical emergency department, many nurses have reported back pain and display risk factors for back injuries. Proper preventative care and safe lifting techniques can protect nurses in the emergency department and improve patient care. Overall, back injuries have been shown to have detrimental effects on all aspects of healthcare and prove to be a risk to nurses and patients. In connection to these findings, a flyer was created demonstrating proper lifting techniques, primary prevention, and exercises to increase back muscle strength.

The Importance of Congestive Heart Failure Education to Decrease Hospital Readmissions

Madeline Imus

Faculty Mentor: Cara Tietjen

Egan School of Nursing & Health Studies

Booth: 63

Abstract:

Congestive heart failure is a major condition that affects millions of people in the United States. A big issue that comes along with CHF is the rate of hospital readmissions. Nearly 1 in 4 congestive heart failure patients are readmitted within 30 days of discharge. These hospital readmissions are avoidable with patient education on ways to manage congestive heart failure at home. Many hospitals have educational packets that can be referenced to manage CHF, but patients have stated that high volume materials can be overwhelming and confusing (Gatto et al., 2022). Infographics can be used to help educate CHF patients during discharge teachings. An infographic has been created in conjunction with the capstone presentation for CHF patients in an acute care setting that includes information regarding ways that patients can manage CHF at home, and in turn decrease the rate of hospital readmissions.

Nurse Education on Implementing the Standard of Care in IV Dislodgement

Maeve Jordan

Faculty Mentor: Amanda Martino

Egan School of Nursing & Health Studies

Booth: 64

Abstract:

The use of intravenous therapy is a universal treatment that almost every patient in a hospital receives. IV dislodgement and displacement create a barrier to the client's health due to many complications. The complications include phlebitis, infiltration, and infection, and in a few cases, there are more serious issues such as air embolism or hemorrhage. In addition to the complications, IV displacement can cause a delay in medication administration that may be vital to the health of the individual. Throughout my years in nursing school, I can recall various cases of IV dislodgement and the repercussions. In the last few years, there has been a need for a tool to help with this major issue in healthcare. Various ideas have been implemented, trials have been conducted, etc. Emphasizing evidence-based practices and the latest guidelines, the educational program aims to equip healthcare professionals with the knowledge and skills necessary to minimize the risk of IV dislodgement and its associated complications.

The Benefits of Adhering to Chlorhexidine Gluconate Bathing in Pediatric Patients With Central Lines

Marina Karalis

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 65

Abstract:

Several pediatric patients require the use of central venous catheters in order to receive sufficient treatment for their illness. Central venous catheters place pediatric patients at an increased risk for infections. There are several methods used in preventing central line associated bloodstream infections that are extremely important to adhere to. While observing a pediatric short stay unit in a large urban hospital, there were few patients with central lines which was significant in determining the learning need for the staff on the unit. Daily chlorhexidine gluconate baths were required for patients with CVL's, but many staff members were unaware of the correct ways to give a proper CHG bath, as well as the importance of adhering to giving them daily. The evidence based literature in this project shows the benefits of staff adhering to daily CHG baths in reducing CLABSI and the costs for patients and families.

The Importance of Bedside Handover to Increase Patient Experience in the ED

Caroline Katovitz

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 66

Abstract:

A handover is defined by the Joint Commission as “a transfer and acceptance of patient care responsibility achieved through effective communication. It is a real-time process of passing patient-specific information from one caregiver to another or from one team of caregivers to another for the purpose of ensuring the continuity and safety of the patient's care.” (The Joint Commission; 2018) An important aspect of handover that nurses often do not engage in is conducting it in front of the patient. The benefits of bedside handover include a decrease in medication errors, improvements in patient safety, a decrease in falls, a better patient/nurse relationship, and higher patient satisfaction. The gold standard of handoff should be facilitating it at the bedside. Research shows that by facilitating direct communication in the patient's presence, bedside handover encourages active patient participation in care decisions, leading to increased patient experience and a sense of empowerment. This project aims to emphasize the benefits handover has on patient experience and increase compliance in facilitating it at the bedside.

Empowering Diabetic Patients: Enhancing Education to Prevent Rehospitalization

Anna Kennedy

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 67

Abstract:

The lack of diabetic education at discharge contributes to rehospitalization for unmanaged diabetes, highlighting the need for comprehensive patient education. This capstone project addresses this gap by developing an educational tool that acts as a nursing checklist focused on key aspects such as the glucometer, insulin administration, discharge instructions, and patient education. In collaboration with nursing staff and my preceptor, it was identified that this area is pivotal for improving patient outcomes. Through literature review and clinical nursing experiences, a practical and visually appealing educational resource was created. The benefits of this tool include clarity, reproducibility, and immediate clinical applicability, supporting patients, caregivers, and nursing staff alike. Challenges encountered underscored the importance of simplicity and consistency in educational materials, with valuable lessons learned regarding effective communication and interdisciplinary collaboration. Ultimately, this project aims to enhance patient care by providing individuals with the knowledge and resources necessary for successful diabetes management, thereby reducing rehospitalization rates and improving overall patient outcomes.

Sleep Promotion for Pediatric Oncology Patients During Hospitalization

Brenna Kennedy

Faculty Mentor: Professor Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 68

Abstract:

Pediatric cancer remains one of the leading causes of childhood death. Despite this, medical advances have improved treatment modalities and survival rates of pediatric cancer patients. This capstone seeks to uncover the main causes of sleep disturbances and how to educate healthcare professionals to better promote sleep during hospitalization. Sleep disturbances caused by many hospital-related factors including alterations in routines, overnight vital signs, collecting laboratory specimens, administration of medications, treatment side effects, and environmental disruptions can have a host of adverse effects. Due to the large range of factors that can lead to impaired sleep, it is necessary to provide more holistic care that can reduce nighttime disturbances and promote sleep in the hospitalized pediatric oncology population. Modifying the environment, reducing nighttime vital signs monitoring in stable patients, altering medication administration and laboratory specimen collection times, promoting routines, and utilizing nonpharmacologic interventions can increase high-quality restorative sleep in this population.

Recognizing Transfusion Related Acute Lung Injury (TRALI)

Ellie Kilmartin

Faculty Mentor: Mary Anne Caserta

Egan School of Nursing & Health Studies

Booth: 69

Abstract:

Transfusions of blood and blood products are very common treatments used in healthcare today which are implemented with the goal of stabilizing hemodynamics in patients. While extremely helpful and effective, transfusions do not come without risks and complications, one of the most fatal being the Transfusion Related Acute Lung Injury. Transfusion Related Acute Lung Injury (TRALI) is a rare but life threatening complication that arises after patients receive a transfusion of blood or blood products. TRALI is “the leading cause of transfusion-associated morbidity and mortality” (Tung et al., 2022). This complication presents as “pulmonary edema associated with hypoxaemia” (Ackfeld et al., 2022), however the evidence shows that the symptoms of this condition are not commonly recognized, leading to poor patient outcomes. In my time on the Hematology/Oncology unit, I have observed multiple patients receive blood products in order to stabilize their condition. When speaking with nurses on this floor, they highlighted the fact that while rare, this condition has presented on the floor a few times in the past, and only been caught once. In further exploring this issue, I have found that if the symptoms are clearly outlined, and posted in a frequently visited area by staff, patient outcomes can be improved and serious injury can be prevented.

The Importance of Addressing Burnout Syndrome and Compassion Fatigue in Oncology Nurses

Morgan Kochis

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 70

Abstract:

Nursing burnout and compassion fatigue are ever prevailing mental health crises that plague nurses of all ages, genders and unit specialties. While all nurses are subject to experiencing burnout and compassion fatigue, the specific disease processes, comorbidities, and mortality that oncology nurses witness daily seems to increase their likelihood of experiencing these psychosocial consequences. Although providing patients care is of utmost importance in healthcare, oftentimes in doing so, the health and well-being of nurses themselves is severely overlooked or neglected. The evidence-based literature that is presented in this project examines what burnout syndrome and compassion fatigue are, as a means of better understanding how to recognize and treat their signs and symptoms. Specifically, this research highlights the importance of taking a holistic approach to providing care for oncology nurses (Jarred et. al. 2020). As a result, by focusing on reducing these feelings of burnout and compassion fatigue, oncology nurses will be better able to maximize the care that is provided to patients and improve patient outcomes. Keywords: Oncology nurses, Burnout, Compassion fatigue, Holistic care

Surgical Patients at Risk: Skin Integrity in the Operating Room

Julia Kormylo

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Egan School of Nursing & Health Studies

Booth: 71

This research was also presented at National Student Nurses Association Conference

Abstract:

Skin integrity, a major focus of research and evidence-based practice protocols, is important when considering surgical patients in the intraoperative setting. They are particularly vulnerable due to sedation of consciousness, operative positioning, and a compromised state of health. The nurse role is to conduct skin assessments, implement prevention measures, and provide documentation. However, the role is less defined intraoperatively. There is a need to identify best practices concerning skin assessment in the operating room (OR).

This project includes a review of peer-reviewed studies and clinical practice guidelines on preventing pressure injuries (PIs). Best practices and documentation requirements were identified. Next, firsthand observations were conducted. Best practices include prevention measures, and conducting a 'four eyes' skin assessment. Additionally, intraoperative documentation should include ongoing assessment of skin to decrease breakdown. Standardizing interventions to prevent PIs would ensure proper patient care across all ORs. The implications of these nursing practice findings would be vast and produce preventive and positive benefits for a large population.

The Importance of Renal Diet Adherence for Pediatric Hemodialysis Patients

Rebecca Kowal

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 72

Abstract:

Hemodialysis can often be an overwhelming process, especially for pediatric patients. There are many factors to balance when it comes to this treatment, proper diet being one of them. Maintaining a diet that enhances, rather than negates, hemodialysis's functions is vital to maximizing the effectiveness of treatment. Frequently, though, hemodialysis patients do not adhere to the appropriate renal diet. This renal diet is important, as complying assists in lowering levels of electrolytes such as sodium, potassium, and phosphorus, lessens waste in the blood, and also diminishes kidney damage. Increased levels of these electrolytes can have serious impacts on overall health, emphasizing the importance of dietary adherence when kidneys are unable to properly regulate. Through observation at a pediatric dialysis center in an urban hospital, it became apparent that not all patients adhere to the suggested diet while receiving dialysis. Many patients expressed little to no interest in engaging in conversations with healthcare professionals regarding eating habits. As a result of their nonadherence, these pediatric patients experienced negative effects of increased electrolyte levels. Research, in combination with knowledge of electrolyte function within the human body, indicates that hemodialysis patients benefit from proper renal dieting and adherence is essential. The creation of a pediatric-friendly handout can serve as a tool that makes dietary adherence recommendations more accessible and digestible.

Enhancing Patient Safety through Limb Alert Identification in the Clinical Setting

Ashley Krol

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 73

Abstract:

The 2024 National Patient Safety Goals from the Joint Commission highlight accurate and appropriate patient identification as a priority. This abstract explores the implementation of limb safety measures as a strategy to enhance patient identification in clinical settings.

Understanding the Critical Need for Nursing Mental Health Support Following Patient Mortality

Samantha Lee

Faculty Mentor: Amanda Martino

Egan School of Nursing & Health Studies

Booth: 74

Abstract:

The nursing profession is a noble, but emotionally demanding field. Nurses often find themselves confronted with the emotional aftermath of patient mortality, yet have to immediately continue with their day without debriefing the situation or taking a moment to themselves. This study delves into the critical necessity for mental health support tailored to the challenges faced by nurses following the loss of a patient. Through an extensive review of literature, this research investigates the psychological impact of patient mortality on nursing professionals, coping mechanisms, and support systems within a large urban hospital. By recognizing the toll that these experiences take on nurses, this study advocates for the implementation of targeted mental health resources and interventions. This project includes an infographic for the unit including information on a mandatory meeting for everyone involved in the code to debrief with each other, peer support groups, and promotion of the employee mental health resource program at the hospital. Ultimately, this research contributes to enhancing the well-being of nursing professionals, thereby improving patient care outcomes and fostering a more compassionate healthcare environment.

The Importance of Proper Aseptic Technique in Preventing Infection in the Oncology Patient Population

Isabella Lembo

Faculty Mentor: Elsie Hernandez

Egan School of Nursing & Health Studies

Booth: 75

Abstract:

The oncology patient population experiences a greater vulnerability for infection related to their current treatment course and compromised immune system. With this increased susceptibility, proper infection precautions are imperative, such as proper aseptic technique, to minimize adverse patient outcomes. When necessary infection precautions are not maintained, hospital-related illnesses are a common consequence for oncology patients. Aseptic technique aids in preventing bacteria contamination to the patient from various external sources in the hospital. Adherence to proper aseptic technique eliminates additional germs in oncology care which results in improved outcomes such as shorter hospital stays, fewer health-care-associated infections, and decreased expenses for oncology patient populations. This project demonstrates that by maintaining an aseptic technique for the immunocompromised oncology population, the probability of negative patient outcomes can decrease significantly. Through the implementation of an infographic with important information needed for healthcare workers to maintain an aseptic technique, these preventable infections can be combated in oncology patients.

Effect of Early Ambulation on Post-Operative Urinary Retention

Francesca Lent

Faculty Mentor: Lynn Massoia

Egan School of Nursing & Health Studies

Booth: 76

Abstract:

During the postoperative process, many patients are required to void before discharge or unit transfer. Post-operative urinary retention (POUR) can occur if this voiding doesn't happen. An extensive literature review was conducted, showing anesthesia, medications and pain are intraoperative components that contribute to the body's increased risk for POUR after surgery (NLM). Furthermore, early ambulation after surgery was found to be the most favorable intervention against POUR (TAU.) Nurses at large hospitals can implement this recommendation of early ambulation in the PACU to prevent the patient from POUR, unnecessary catheterization, CAUTI risk and financial burdens. Providing an infographic to PACU nurses about POUR and how they should implement ambulation as part of their tasks before patient transfer or discharge can benefit the patient tremendously. A comparison of patients who were ambulated and not ambulated post-operatively after the same operation, should be done to re-evaluate the implementation.

Central Venous Catheter Care for CLABSI Prevention

Kaitlyn Lentz

Faculty Mentor: Majeda Basilio

Egan School of Nursing & Health Studies

Booth: 77

Abstract:

Central venous catheters (CVC) play a crucial role in healthcare for a variety of critical patients. However, they come with a high risk for potential infection, especially when not properly cared for. Central line-associated bloodstream infections (CLABSIs) can be extremely dangerous for this patient population and can be acquired in the hospital setting if certain precautions are not taken. This project aims to emphasize the evidence-based practices in place for central line care for the prevention of developing CLABSIs. The articles evaluated for this project analyzed the most effective interventions for the best outcomes of care, as well as the most efficient way to implement them. Many of the protocols in place at the medical surgical unit observed includes CHG bathing, frequent catheter assessment, and utilizing antiseptic techniques and caps. The literature review found that these interventions have successfully reduced the incidence of CLABSIs. Furthermore, research has shown that implementing these interventions all together in a bundle format has been a very effective method of care. Therefore, a simple checklist reminder of these interventions that can be displayed in patient rooms with central lines can help to highlight these necessary tasks to support the safety of the patient.

True Vs. False Labor

Emma Lettieri

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 78

Abstract:

Pregnancy is an exciting time for parents, however as the due date approaches, there can be uncertainty. Questions commonly asked are “When should I come to the hospital” or “How do I know if I am in labor?” The ability to differentiate between true and false labor is crucial for parents to ease anxiety, facilitate informed decision-making and prevent unnecessary hospital visits. As a member of the healthcare team, the goal is to answer these questions and educate parents about the differences between these concepts. Research supports that knowing the signs, planning ahead, timing contractions, prenatal classes, and educational resources can all assist in equipping parents and building the knowledge they need. Providing parents with knowledge and resources to determine true vs false labor allows the healthcare team to promote proactive decision making and enhances the overall birthing experience. Empowering parents through education and encouraging them to ask questions creates a sense of preparedness and confidence as they navigate through this exciting time. Keywords: True vs False Labor, Pregnancy, Healthcare, Education, Contractions, Decisions, Prepared

Importance of Oral Care Education for Mucositis Prevention in the Oncology Patient

Abby Ligas

Faculty Mentor: Laura Conklin

Egan School of Nursing & Health Studies

Booth: 79

This research was also presented at National Student Nurses' Association 72nd Annual Convention

Abstract:

A patient centered handout was developed after completing a review of literature on the topic of preventing mucositis in the oncology patient. The handout is designed to be used in the development of an oral care plan for the patient. Brushing twice a day with a soft bristled toothbrush, using chlorhexidine-based rinses, and keeping lips moist were all highlighted as ideal prevention techniques. A handout is the chosen method of education because it is easy to distribute, cheap to produce, and can be taken home with patients after they are discharged. Based on findings from the review of literature, providing written education on oral hygiene options for patients receiving chemotherapy and radiation could be effective in decreasing the severity of mucositis and increase patient quality of life. Managing symptoms can decrease pain, risk of infections and bleeding, and improve compromised oral function.

Oral Care Checklist in Nursing Practice

Isabella Lodico

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 80

Abstract:

Inadequate oral hygiene care is proven to result in various health complications. This capstone project addresses the prevalent issue of poor oral care practice on a busy medical floor. The aim is to develop a practical tool to remind nursing staff to prioritize oral care amidst a busy shift. The tool consists of a laminated checklist displayed in the patient's room, allowing nurses and nursing assistants to mark off each intervention as it is completed. Research highlights nurses' inconsistency in inquiring with patients regarding oral care due to assumptions and busy schedules. Consequently, complications such as oral pain, infection, and poor self-esteem arise. Identifying the learning need emphasizes the importance of oral hygiene care in the hospital setting and offers an effective solution to improve patient outcomes.

Implementing a Nurse Driven Patient Education Pathway to Improve Outcomes in Patients with Diabetic Wounds

Olivia Lupisella

Faculty Mentor: Majeda Basilio

Egan School of Nursing & Health Studies

Booth: 81

Abstract:

Diabetes is a prevalent disease in American today, affecting over 34 million people (Dasari et al., 2021). It is seen in hospitals regularly, most often for related complications (Dasari et al., 2021). One of the most common complications of diabetes is the development and poor healing of wounds. A diagnosis of diabetes alone can be overwhelming for someone to grasp, let alone understanding all the complications that come with it, and how to properly manage it all. Unfortunately, many people with type II diabetes do not get properly educated on the concept of diabetes, and especially not on its possible complications. This leads to poor self management of patients' diabetes, specifically glycemic control, which results in the development of comorbidities, such as such as peripheral neuropathy and wounds, that are then seen and treated in hospitals repeatedly.

To bridge the gap between lack of effective diabetic wound education and repeated hospital admissions for diabetic wound complications, this pathway was created for nurses to use to facilitate an investigative interview to learn what their patients already understand about their type II diabetes and wounds, and provide appropriate resources to fill in the gaps in this education. Results show that this method of collaborative patient education is more effective in improving patient health outcomes than didactic education methods (Heng et al., 2020). The pathway was successful in identifying gaps in patient education, and providing the necessary individualized education needed to empower patients to better manage their type II diabetes and related wounds.

Benefits of Incentive Spirometry for Hospitalized Patients

Reese Lynch

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 82

Abstract:

Hospitalized patients have an increased risk for developing pulmonary complications, especially related to significant periods of inactivity. To combat this, patients are frequently given Incentive Spirometers (IS), but these are often used ineffectively and with poor adherence. It was observed on a Medical-Surgical Unit that patients inconsistently used their IS and expressed confusion about IS use. This capstone project explores studies on benefits of IS use for hospitalized patients and IS adherence. A review of literature found that IS an effective method of improving patient lung function, shortening hospital stays, and preventing pulmonary complications such as pneumonia and atelectasis. Additionally, healthcare providers strongly reported a need for improvement in patient IS adherence. A patient handout was created to supplement education and improve IS use. Further research should be completed regarding efficacy of patient handouts and patient education related to IS adherence and subsequent health outcomes

Infant Car Seat Safety

Grace Magilligan

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 83

Abstract:

It was identified that parents, do not own or are not using car seats appropriately, at their time of discharge from the postpartum unit. For child safety, babies cannot be legally discharged without a proper infant car seat. These seats, when used properly, improve injury and survival rates for infants in car accidents. It was evident that education was needed for parents prior to discharge on proper installation and use of car seats and the importance of these devices for infant safety in motor vehicle collisions. A demonstration by nurses at discharge was proposed and a safety tip sheet was created in English and Spanish to remind parents of the proper use of car seats to improve infant safety.

The Importance of Monitoring a Heparin Drip

Kathryn Magno

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 84

Abstract:

The Medical-Surgical world is a busy one as nurses on each unit are assigned numerous patients to care for each shift. Due to that, it can be hard for a nurse to manage the medications each patient needs to receive, hygiene care, talking to the family members of each patient, emergency situations that may pop up throughout the shift, and to provide other necessary care. Given that information, this project aims to investigate a medication that can be critical if not monitored very closely; heparin drips.

Heparin drips can be an extremely harmful medication if the laboratory work that coincides with it, the partial thromboplastin time, is not evaluated quite often. This partial thromboplastin time allows the healthcare team to understand if the drip is working therapeutically or if it needs to be adjusted (varies for each patient). Therefore, it is consequential for nurse's to keep an eye on when this lab work is due and when the results come in. Without these results, a patient may be receiving too much or too little of the ordered dose. In regards to this information, a poster of a PTT mnemonic was developed that can be placed in different and well noticed spots throughout the unit. This not only continuously reminds the nurse's to keep up with these lab values, but the entire healthcare team that passes the posters as well! It will be able to hold each and every person accountable for the care that they give to patients on heparin drips.

Prevention of Ventilator Associated Pneumonia in Surgical ICU Patients

Kristen Mangione

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 85

Abstract:

Ventilator associated pneumonia (VAP) is one of the most common hospital acquired infections in the critical care setting, and can occur in patients that are on mechanical ventilation for more than 48 hours. Signs and symptoms of VAP can include purulent tracheal discharge, fevers, and respiratory distress. Interventions such as raising the head of patients' beds, frequent suctioning, and daily sedation interruptions have been shown to reduce the amount of patients that acquire ventilator associated pneumonia during their hospital stay (Buterakos, et al, 2022). It was noticed that many patients in the Surgical ICU were on mechanical ventilation, and therefore at risk for acquiring ventilator associated pneumonia. Because the most important action to take with VAP is preventative action, education on interventions to prevent VAP in patients on ventilators is essential. A prevention checklist was made for ICU nurses to reference throughout a shift to ensure all measures are being taken to reduce incidences of VAP in the Surgical ICU (Khobodi, 2023).

Wellness Programs to Mitigate Burnout and Compassion Fatigue Among Critical Care Nurses

Payton McCarthy

Faculty Mentor: Lynn Massoia

Egan School of Nursing & Health Studies

Booth: 86

Abstract:

Critical care nurses are at a heightened risk of experiencing burnout and compassion fatigue due to the demanding nature of their work environment. Recent research has discovered that burnout is prevalent among about 40% of critical care nurses. Therefore, wellness programs offer a proactive approach to addressing challenges by providing nurses with resources like mindfulness training, meditation and sleep exercises, stress management, well-balanced nutrition recipes, and exercise plans. This project addresses the importance of implementing prevention and management strategies in the workplace. The project examines ten studies used to investigate the prevalence of burnout, resources, and the positive impact of wellness programs among nurses. Significant findings demonstrate that wellness programs improve nurses' physical, mental, and emotional health which improves job satisfaction, reduces burnout, and enhances overall quality of patient care and personal well-being.

The Importance of No Distraction Medication Administrations

Allison McGough

Faculty Mentor: Amanda Martino

Egan School of Nursing & Health Studies

Booth: 87

Abstract:

Nurses everywhere are faced with the tasks of withdrawing and administering medications to their patients everyday. In the event of medication errors, patients have been left in worse conditions than they arrived in. Nurses also are oftentimes let go from their jobs and in certain cases have even lost their nursing license. Nurses care for patients with a variety of different diagnoses and needs. This requires the safe withdrawing and administration of medications to patients. Nurses must solely be focused on this task. This capstone project examines six studies that all highlight the benefits and importance of no distraction medication administrations. Distraction free environments are important for nurses so that they can ensure that they are providing the highest quality of patient care. Preventing medication errors can save lives. The flyer is a simple yet effective tool that can be posted within any healthcare setting. With just a few simple steps, the flyer can save lives and save nurses from losing their jobs.

Interventions to Prevent Pressure Injuries

Grace McGrath

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 88

Abstract:

While in the hospital bed-bound patients are more likely to obtain a pressure injury. Pressure injuries are areas of skin damage caused by a lack of blood flow, friction, moisture, and pulling skin. Pressure injuries often occur over bony parts of the body, such as hips, heels, tailbones, the spine, and knees. These pressure injuries remain a significant problem within hospitals. While observing the medical surgery unit, most patients are bed-bound and acquire pressure injuries. Some patients come to the unit from long-term care facilities already having a pressure injury. Interventions and protocols are in place on the unit to prevent these injuries, but they are still occurring. More education is needed on the unit and throughout the hospital. Educating nurses on pressure injuries and interventions will help decrease the rate of hospital-acquired injuries.

Importance of Art Therapy with Mental Health Patients

Caryn McGrory

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 89

Abstract:

Mental health patients have to be treated as an entire well-being rather than focusing just on their diagnosis. While observing the Emergency Department I noticed the need for heightened mental health awareness among the staff. Conversations with my instructor revealed the inadequacy of tools provided to nurses when caring for a patient with mental health concerns. Due to the fact that the hospital's mental health unit is for adult care, many of the pediatric population is left waiting in the emergency department psychology area, often isolated and lacking specialized care. Recent literature reviews found an immense amount of benefits from art therapy. Art therapy has promising interventions with mental health treatment, offering a creative avenue for expression and healing among patients facing various psychological challenges. Incorporating various forms of art therapy in the Emergency Department protocol can enhance the treatment of patients, providing patients with a creative outlet to better the healing of any health concerns.

Importance of Early Ambulation in Elderly Patients Post Operatively

Hannah McLaughlin

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 90

Abstract:

Ambulation in all aspects of medical care, is proven to impact patients in very positive ways. Post operatively, it is critical for elderly patients to mobilize as soon as possible to prevent further complications. Ambulation helps the hospital as well by reducing unnecessary costs and services. If there is no specific documentation about how many times an elderly patient has ambulated, there can be delays in mobilizing which can lead to future issues. After having transition clinical on a surgery floor, there were many patients post operatively. It was noticeable how much of an impact ambulation had on patients. Early mobilization in post operative elderly patients reduces length of stay, prevents pulmonary embolisms, DVTs, UTIs, and other issues that can lead to extra costs and readmissions. Using a specific report sheet and highlighting the patient's activity will better improve the productivity of both the nurse as well as the patient.

Enhancing Patient Education on Lifestyle Modifications Regarding Management of Type 2 Diabetes Mellitus

Kathryn McTeague

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 91

Abstract:

Type 2 diabetes mellitus (T2DM) is a preventable chronic condition that can be managed with medications and lifestyle modifications. If these plans are not followed, patients' health can suffer, putting them at risk of hospitalization. On a large medical unit in an urban setting, this issue was identified as a learning need and a literature review was carried out to further investigate. Findings indicate patients do not act on provider recommendations which has a negative impact on their health status; however, using motivational interviewing (MI) has proven successful in creating lifestyle change. A tool that utilizes components of MI was developed to aid with conversations about management of T2DM and empower patients to implement change. This simple tool gives patients a tangible plan to look to and creates drive from within for a healthier lifestyle, hopefully reducing hospitalization. Keywords: type 2 diabetes mellitus, lifestyle modifications, motivational interviewing, prevention and management.

The Benefit of Using Signage to Decrease Hospital Acquired Infections and Peritonitis in Patients Receiving Peritoneal Dialysis

Ava Morrison

Faculty Mentor: Amanda Martino

Egan School of Nursing & Health Studies

Booth: 92

Abstract:

During kidney failure, your body is unable to excrete wastes from the blood and filter out any extra fluids from the body. An intervention known as Peritoneal Dialysis (PD) is used to remove those wastes from the blood via a catheter in the patient's abdomen. The inner lining of their abdomen, "known as the peritoneum, acts as a filter and removes wastes from blood which then is taken out and thrown away" (Mayo Clinic, 2024). Each time a patient receives PD they will be connected and then disconnected to what is known as a cyclor, which allows for the abdomen to fill with fluid and then drain to excrete the wastes. While PD has been very effective in treating patients with kidney failure, there are several associated risk factors, the most common and severe being infection. These patients have an increased risk of developing an infection, especially in a hospital setting, due to their catheter and its constant connecting and disconnecting to the cyclor. While observing PD treatments at a large, urban, non-profit hospital, it was found that while room doors were to be kept closed during connection and disconnection times of the cyclors, that was not always the case. Many would not know what is going on and walk into the room, which, as a result, puts the patients at an increased risk for infection. The evidence-based literature provided in this project, highlights the negative and life-threatening effects hospital acquired infections and peritonitis can have on PD patients. This project aims at decreasing the high risk of infection rates that exist in the hospital setting during connection and disconnection exchanges. In connection to the research, signage was created that will not only help to keep PD patients in a safe and healthy environment free from infections but also help the nurses to focus on providing safe and effective care.

The Importance of Target Oxygen Saturation Goals in Neonates on Supplemental Oxygen

Alexandria Morrissey

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 93

Abstract:

Neonates, most commonly premature infants are, often born with underdeveloped lungs, which can compromise their ability to breathe, making the use of supplemental oxygen common. Although necessary, the administration of this drug is delicate. Both inadequate and excessive oxygen levels can lead to poor outcomes. Ensuring optimal oxygen levels in neonates is critical to prevent long term complications but also assists with adequate tissue perfusion. This project discusses the importance of target oxygen saturation goals which are used to reduce the risk of complications and comorbidities. Several studies have provided evidence that maintaining oxygen saturation levels within a targeted range and balancing both hypoxemia and hyperoxemia reduces the rates of retinopathy of prematurity (Srivatsa et. al. 2021). An infographic was created for each patient's bedside. It is intended to enhance adherence to the patient's oxygen target goals, which aims to improve patient outcomes and lessen the likelihood of complications.

Nurse-Driven Interventions to Reduce Clinically Insignificant Alarms in Acute Care Settings

Caroline Murray

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 94

Abstract:

As medical technology advances and new devices are added to the bedside, more harmful noise is created in the hospital environment. These alarms burden nurses with repetitive noise and disruptions to patient care for what is supposed to be a signal of patient deterioration. In reality, at least 85% of the time, these alarms are insignificant or false. Nurses have been growing increasingly fatigued by this excessive noise and false alarms, impacting response times to true alarms and diminishing their trust in the technology. These deficits result in patient harm and staff discomfort. Alarms require proper management to mitigate the risk of nurse burnout and protect patient safety. Evidence-based interventions have been developed to reduce these nonactionable alarms and have effectively reduced the total number of alarms per hospital bed per day. The nurse-driven CEASE alarm bundle strategy involves proper skin hygiene for electrode and sensor placement, individualized parameter settings for each patient, educating nursing staff about the use and setup of these devices, and clear communication on all of these interventions within the interdisciplinary team. This method in practice has proven to reduce total monitoring alarms by 31% and decrease nurses' perception of their own alarm fatigue.

Reducing readmission rates among congestive heart failure patients through increased patient education

Kiersten Murray

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 95

Abstract:

Congestive heart failure is a disease that plagues the United States. Being one of the leading causes of hospitalization and mortality, its effects go beyond just the financial strain it places on the healthcare system. Rehospitalization, or being readmitted to the hospital within 30 days of discharge, is oftentimes avoidable in this patient population. A learning need has been identified with the goal of decreasing rehospitalization rates in patients with congestive heart failure. An infographic has been developed with the aim of preventing rehospitalizations among congestive heart failure patients. In providing patients with clear and easy to understand information about their condition, how to prevent exacerbations of congestive heart failure, and how to better manage their disease, it is anticipated that 30-day rehospitalization rates among congestive heart failure patients will decrease.

The Importance of Using Thermoregulation Techniques to Prevent Hypothermia in Premature NICU Infants

Alyssa Nadeau

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 96

Abstract:

Neonates are susceptible to a variety of health concerns that can deter healthy growth and development. Hypothermia is a potentially life-threatening condition for premature infants. Evidence shows that neonatal hypothermia is one of the highest risk factors for mortality and morbidity in this population (Goyal, 2023).

At a large, urban level IV NICU, it is common for many patients to be premature and at an extremely low birth weight (ELBW). These patients have a need for thermoneutral environments in order to keep them safe and in avoidance of potential life-threatening conditions from hypothermia. Evidence based literature shows that not only swaddling can increase temperature (Patimah et al., 2022), but also that use of an incubator can also significantly improve bodily temperature (Goyal, 2023). This project used this information to develop a flyer that not only educates nurses on the potential effects of neonatal hypothermia on the patient, but also a checklist that ensures these strategies are being implemented hourly, throughout both shifts in a 24-hour period.

Optimizing Palliative Care in Oncology Patients

Riley Nicholson

Faculty Mentor: Elsie Hernandez

Egan School of Nursing & Health Studies

Booth: 97

Abstract:

Palliative care (PC) is defined as an approach that improves quality of life for patients and families who face serious illness by preventing and relieving suffering through early identification, correct assessment, and treatment (World Health Organization, 2020). Palliative care is unique in that it involves comprehensive care of the mind, body, and spirit, and continuously looks for a cure, a distinctive characteristic compared to hospice care. It is patient-centered, requiring a team approach to pay attention to specific needs of the person, and is considered a human right to health. In the inpatient oncology unit at local urban hospital, and most other healthcare centers in the world, there is no defined policy in how or when to implement palliative care, and most of the time it is the responsibility of the nurse to request a palliative care consult.

This project aims to combat a nurse's time constraint, as well as reduce the suffering of oncology patients, by developing a comprehensive palliative care assessment tool in order to identify specific patient needs throughout their diagnosis and treatment. This will help the interdisciplinary team understand key concerns of the patient and address their needs in a timely manner, therefore reducing patient suffering and optimizing the limited time of palliative care providers. The success of this assessment tool will be measured by patient satisfaction and improved quality of life. By implementing this tool, the hope is that patients' concerns and needs will be responded to in a timely manner.

The Importance and Benefits of Standardized Nursing Bedside Shift Report

Katherine Oatman

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 98

Abstract:

Effective communication is crucial for ensuring patient safety and continuity of care. As part of a Registered Nurse's role, proactive communication about patient updates during transitions of care is essential. While many nurses employ their own methods of handoff, utilizing a standardized reporting tool and location can enhance accountability and significantly impact the transition of care between staff nurses. In observation of a Medical Stepdown Unit, change of shift report primarily occurred at the nurses' station without visualization of the patient or family at the bedside. Although nurses effectively communicated essential updates about patient conditions, significant gaps existed between the time of report and time of initial patient assessment. These inconsistencies in reporting techniques may lead to worsened patient outcomes, missed information, and increased confusion from patients. Reviewing evidence-based literature about the benefits of a standardized bedside shift report, confirmed that nursing report at the bedside significantly improves nursing performance, accountability, and fosters a healing environment for patients. In support of evidenced-based research, a new bedside report sheet was created, integrating the scope of a proper patient report and streamlining a checklist for effective nurse to nurse communication of patient needs and updates. By standardizing nursing change of shift report, a higher-quality level of care will be provided to patients, leading to a more satisfactory working and healing environment.

The Vital Role of Communication Training for Emergency Department Nurses Supporting Patients through Pregnancy Loss

Ellie O'Brien

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 99

Abstract:

Pregnancy loss represents a profound and emotionally challenging experience for women and their families. Emergency Department nurses play a pivotal role in providing immediate care and support to individuals encountering many traumatic events, including loss. There is a clear necessity for tailored training programs that equip ED nurses with the necessary skills, knowledge, and empathetic communication strategies to effectively support patients experiencing pregnancy loss. Such training emphasizes the significance of a compassionate and nonjudgmental approach, fostering a caring environment where patients feel heard, validated, and respected during their time of distress. By creating a culture of empathy, understanding, and sensitivity, nurses can greatly impact the experiences of individuals navigating the complexities of grief and loss. These communication skills ultimately enhance the quality of care and support provided in emergency healthcare settings. The need for exceptional communication skills for ED nurses is extremely important, especially when the nurses are addressing this delicate situation. Creating a safe and comfortable environment for people going through pregnancy loss is very essential for positive outcomes.

Telemetry Monitoring Education

Audrey Orsino

Faculty Mentor: Amanda Martino

Egan School of Nursing & Health Studies

Booth: 100

Abstract:

Telemetry Monitoring is a crucial part of caring for patients who have an abnormality in their vital signs. The telemetry monitor assesses the patients' heart's electronic waves, heart rate, oxygen saturation, and respiratory rate. The device takes readings continuously which are then sent to a central monitoring system. Healthcare providers can assess this data and ensure the safety of their patients. Not only can telemetry monitoring promote early detection of a problem, but because the monitor is small in size it does not restrict the patient's movement. Patients often have limited education on what the device is doing, why they have it on, and how to ensure it is working correctly. It is important to educate the patients about the monitoring system to allow them to make informed decisions related to their care. Providing patients with a learning tool will help to fill the missing gap of information. By providing a comprehensive learning tool to the patient, they can have the resources they need to expand their knowledge and answer any questions regarding telemetry monitoring.

How to Decrease Post-op Pressure Ulcers after Surgery

Ariana Pagliarulo

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 101

Abstract:

Postoperative pressure ulcers represent a significant challenge in surgical units, adversely affecting patient outcomes and increasing healthcare costs. This capstone project aims to develop and evaluate a comprehensive, evidence-based intervention strategy to reduce the incidence of postoperative pressure ulcers in a hospital surgical unit. Drawing upon current literature, the project proposes a multifaceted approach that encompasses preoperative risk assessment, intraoperative management, and postoperative care. Key components include the utilization of the Braden Scale for preoperative risk stratification, implementation of specialized operating table pads for pressure redistribution, early postoperative mobilization, regular skin assessments, and the use of therapeutic support surfaces. Additionally, the project emphasizes the importance of nutritional support and multidisciplinary collaboration among healthcare professionals, including surgeons, nurses, dietitians, and physical therapists. A pilot study will be conducted to assess the effectiveness of the intervention, with metrics focusing on the reduction of pressure ulcer incidence, patient satisfaction, and potential healthcare cost savings. The expected outcome is a significant decrease in postoperative pressure ulcers, contributing to improved patient care and resource utilization in the surgical setting. This project not only addresses a critical gap in patient care but also serves as a model for implementing quality improvement initiatives in surgical units.

Key Words: Braden Scale, pressure ulcer, surgical units, preoperative skin assessment

Addressing a Knowledge Deficit of Low-Acuity Emergency Department Patients

Madison Peters

Faculty Mentor: Hannah Zhang

Egan School of Nursing & Health Studies

Booth: 102

Abstract:

The strain that is currently placed on Emergency Departments and its staff is continually increasing. There is an influx of patients seeking care, creating longer waiting times and overcrowding resulting in the use of hallways for patient beds. Hallway patients show that Emergency Departments are exceeding capacity and creates an increased risk for fragmented care, medication errors, and misdiagnosis (Richards & Derlet, 2022). The majority of hallway patients have low acuity medical needs (Kim et al., 2020). These low acuity patient needs can often be safely cared for at Urgent Care Centers, thus decreasing the influx of low acuity patient needs in the Emergency Department. Studies have shown that when local Urgent Cares are open, they positively impact the ED by decreasing the number of low acuity visits (Allen et al., 2021). Thus, the aim of this project is to educate patients on when to seek medical care in an Urgent Care setting versus an Emergency Department setting. In order to better educate patients on their options when seeking medical care, an infographic has been created. The infographic explains which medical care center should be used based on a list of common ailments and injuries. It should be distributed and explained to patients while nurses are providing patient education at discharge. The goal of this project is to educate the low acuity populations that present to the ED about their options in hopes of decreasing the number of low acuity patients in the ED.

Reducing the Cost of Waste Related to Medical Supplies

Allison Pienta

Faculty Mentor: Majeda Basilio

Egan School of Nursing & Health Studies

Booth: 103

Abstract:

One of the largest hidden expenses in hospitals relates to wasted medical supplies. Without clear guidelines for the staff on the quantity of supplies needed for each task and procedure, the number of supplies taken from the supply rooms are often more than what is actually needed. This leads to unnecessary waste because once the supplies leave the supply room and enter into a patient's room, they must be discarded due to sanitary reasons. This ultimately leads to increased costs, affecting hospitals, insurance companies, and patients. While observing the medical surgical unit, at an large urban hospital, many nurses and patient care technicians would go into the supply room and take a handful of supplies to bring into patient rooms, just in case they are needed. A majority of these items were placed into drawers, not visible to other staff or patients, or on tables and were never utilized. All of the supplies, unopened and opened, have to be thrown away at discharge due to infection control precautions. The evidence-based literature in this project addresses the importance of only taking and utilizing necessary medical supplies into patient rooms in order to decrease overall waste. An infographic was displayed in the supply room on the medical unit to educate staff to "don't waste what can't be replaced". It highlights the benefits of reducing costs due to unused medical supplies for both the hospital and the patient. The infographic encourages a team approach to improve a costly problem that is greatly affecting hospitals across the globe.

The Importance of Bedside Shift Report in the Emergency Department to Improve Patient Safety

Jaclyn Pinckney

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 104

Abstract:

Bedside Shift Report (BSR) is essential for adequate patient care in the Emergency Department. However, this report oftentimes takes place away from the bedside, at the nurse's station. This setting change poses an increased risk of patient safety since the initial physical assessment during change-of-shift report is nonexistent. Patient safety is of utmost importance for nurses to maintain, with the first step being BSR. BSR allows for visualization of the patient and care needed while addressing their baseline level of consciousness, room hygiene, and medication tactics specific to that patient. This project demonstrates the importance of establishing criteria for change-of-shift nurses by emphasizing what has been done for them up to that point and any active concerns in the patient's condition. By implementing a checklist constructed specifically for BSR, nurses will be reminded of key factors that affect patient safety, to avoid any mistakes during the patient's plan of care.

The Impact of Telehealth on Pediatric Nursing

Ava Plott

Faculty Mentor: Stephanie Caicedo

Egan School of Nursing & Health Studies

Booth: 105

Abstract:

Nursing shortages in Pediatric Healthcare continue to impact the care children receive in the United States. Telehealth is the use of communication technologies to provide healthcare to those with limited access. Telehealth can have a significant impact on these outcomes by providing remote access to healthcare services. It can improve access to care for families in rural or underserved areas, reduce the need for in-person visits, decrease crowding in hospitals, and increase convenience for both patients and healthcare providers. Telehealth enhances communication and allows for ongoing monitoring and management of chronic conditions. Ultimately, leading to better coordination of care and improved health outcomes for children. In hopes to increase the frequency of Telehealth visits and improve outcomes, it was decided to create a flyer explaining the purpose of Telehealth, the benefits of these online appointments, and a checklist of how they can have a successful and purposeful visit.

Family Involvement with Mobility in Parkinson's Patients

Olivia Redlener

Faculty Mentor: Cara Tietjen

Egan School of Nursing & Health Studies

Booth: 106

Abstract:

Parkinson's disease is a disorder of the central nervous system that affects movement, often including tremors. Although there is not yet a cure for Parkinson's, symptoms can be improved by including movement and exercise throughout the day. Parkinson's comes with cognitive function problems, often times leading to dementia which can make maintaining relationships difficult. On a Neurology unit, it was noticed that these patients were not seeing symptom improvement due to the lack of mobility throughout the day. In an attempt to improve quality of life by attempting to improve their symptoms, a handout was created that explains to family members how and why family involvement plays a huge role in encouraging these patients to incorporate mobility into their day. A handout will be effective for this content because it is targeted towards family members involved in care for these patients and it explains how it not only will benefit them as family members, but the patients as well.

Benefits of a Vaginal Birth Following Previous Cesarean Deliveries

Erin Regnier

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 107

Abstract:

Contrary to popular belief, it is possible to have a vaginal delivery after a cesarean section. Vaginal deliveries after c-sections (termed VBAC) have an astounding number of benefits, both to mother, baby, and the healthcare system overall. Cesarean deliveries should be avoided unless totally indicated for reasons outside of the healthcare provider or mother's control. Having one cesarean does not mean that cesareans are indicated for all other pregnancies the woman may have, and it is important the mother is educated of all her options. After spending 12 weeks studying in a small urban hospital in Fairfield county, it was identified the critical need for education patients regarding VBACs . An infograph was created to be included with other antepartum materials that educates the mother about the benefits and risks of a VBAC. Presented in lay-person terms and easy to store, this educational tool will help educate mothers of their delivery options.

Universal Surgical Instrument Signaling

Lucy Renck

Faculty Mentor: Katherine Saracino

Egan School of Nursing & Health Studies

Booth: 108

Abstract:

Surgical Instrument Signaling, or SIS, is the specific hand gesturing used by a surgeon to communicate to a scrub nurse or technician what instrument they need, without using words. With SIS, the scrub nurse or technician and surgeon can avoid error and communication failures. So far, there are only 14 select gestures for SIS in electromyographic signal databases. Implementing SIS into the operating room can reduce communication errors and improve work relationships within the operating room.

Nutrition Log for Oncology Patients

Jillian Richardson

Faculty Mentor: Elsie Hernandez

Egan School of Nursing & Health Studies

Booth: 109

Abstract:

Malnutrition is defined as deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients (World Health Organization 2024). Patients with oncology disorders are often undernourished and fall into the category of undernutrition. While the care team in a hospital, including providers, dietitians, and registered nurses, can assess a patient's nutrition status, patients would benefit from tracking their nutrition patterns. Patients can use this information to have more personalized and targeted nutrition goals and support. Nutrition is an important aspect of health and supportive care during and after cancer treatment. This project aims to provide oncology patients with a tool to self-assess and self-monitor their nutrition and associated symptoms. This can be used during hospitalization in collaboration with the care team or after discharge. Patients and their families or support systems can monitor symptoms related to their oncologic disorder and use their own data to address nutrition deficits. The tool will be successful if patients are satisfied with self-tracking their nutrition and are able to implement changes to their diet. With more adequate nutrition, patients can have an increased quality of life and higher chance of survival. Keywords: malnutrition, oncology, quality of life, nutrition

How to Prevent Post-Op Pressure Injuries with Specialized Beds

Julia Rigolizzo

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 110

Abstract:

Pressure injuries, commonly known as bedsores, represent a significant challenge in post-operative care, often leading to prolonged recovery periods and increased healthcare costs. This project aims to investigate the efficacy of different bed types in preventing pressure injuries among post-operative patients. Throughout this project various beds, including standard hospital beds, alternating pressure mattresses, and low-air-loss mattresses, are compared based on their ability to redistribute pressure, maintain skin integrity, and promote tissue perfusion. Additionally, factors such as patient mobility, comorbidities, and surgical procedures are considered in assessing the suitability of each bed type. Selecting the appropriate bed type plays a crucial role in preventing pressure injuries among post-operative patients. Healthcare providers must carefully evaluate the unique needs of each patient and consider factors such as mobility, comorbidities, and surgical interventions when determining the optimal bed for pressure injury prevention in the post-operative setting.

The Benefits of ED Education for Low Acuity Cases on Patient Care and Wait Times

Isabella Rossi

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 111

Abstract:

The escalating crisis of prolonged wait times in Emergency Departments nationwide has reached a critical point, exacerbating frustration among patients seeking timely care. Enduring the wait becomes a necessary trade-off for individuals grappling with a spectrum of ailments ranging from nausea/vomiting, fevers, and the common cold to severe pain. Furthermore, healthcare teams must prioritize patients based on acuity levels, ensuring those in dire situations receive immediate attention. However, this prioritization leaves non-emergent patients with discomfort to endure extended wait periods. During my time spent at an emergency department in an urban hospital, this problem was identified as a main stressor on staff as well as resources. Research suggests that the main reasons for the use of the ED as primary care is due to lack of insurance, lack of understanding of the resources available to those with varying insurances, and convenience. The evidence-based literature presented in this project addresses the importance of continued education for healthcare staff on alternative healthcare options for patients as well as education for patients on their options of healthcare based on economic needs and illness symptoms.

The Benefits of Critical Incident Debriefing for Emergency Department Nurses

Alexa Rozanitis

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 112

Abstract:

While organized debriefs following critical incidents occur often on the floors, there appears to be a lack of these debriefs within the Emergency Department. Due to the high turnover of patients and unpredictability of incoming patients, the demand of care seems to prevail the availability of resources and medical care within the Emergency Department. In addition to the typical climate of the Emergency Department, the COVID pandemic produced traumatic effects for nurses working in this area. These occurrences collectively prompt a need for debriefing following critical incidents for Emergency Department nurses. This capstone project analyzes five scientific studies that highlight the potential outcomes of trauma resulting from critical incidents, as well as emphasize the benefits of debriefs following critical incidents in the Emergency Department. Some methods to facilitate a successful debrief include proper organization, having a consistent designated leader, the charge nurse, to conduct the debriefs, the use of positive reinforcement towards each individual involved in the incident, and facilitating a debrief ideally immediately following the incident. There are various benefits of critical incident debriefing, such as reduced burnout rates, improved knowledge, teamwork, and confidence, decreased stress and further trauma, and the creation of a positive and empowering work environment. Furthermore, the use of a critical incident debrief pathway can aid in facilitating a successful and effective critical incident debrief. Keywords: debriefing, critical incidents, trauma, organization, burnout, compassion fatigue

Heart Disease and Postmenopausal Women

Victoria Ruiz

Faculty Mentor: Dr. Rose Iannino-Renz

Egan School of Nursing & Health Studies

Booth: 113

Abstract:

Heart disease remains the leading cause of mortality among women in America, with postmenopausal women facing an increased risk compared to their premenopausal counterparts. This capstone project examines the key risk factors, pathophysiology mechanisms, and preventive strategies concerning heart disease in postmenopausal women. After menopause, hormonal changes, particularly the decline in estrogen levels, contribute to alterations in lipid metabolism, vascular function, and inflammation, all of which are pivotal in the development and progression of cardiovascular disease. Additionally, risk factors such as hypertension, dyslipidemia, diabetes mellitus, obesity, and smoking show an increased impact on cardiovascular health post-menopause. Preventative strategies tailored to postmenopausal women include lifestyle modifications and regular screenings. There has also been recent research done about hormone replacement therapy (HRT), however should be carefully weighed against potential risks and individual patient characteristics. On the Cardiovascular Unit, it was observed that there continues to be a need for education, awareness, and empowerment among female patients regarding their cardiovascular health post-menopause.

Key Words: Cardiovascular Unit, menopause, estrogen, hypertension, hormone replacement therapy

Benefits of Music Therapy for Palliative Care Patients

Devyn Ruiz

Faculty Mentor: Dr. Christopher Lacerenza

Egan School of Nursing & Health Studies

Booth: 114

Abstract:

Quality of life is the primary focus for patients in palliative care. It encompasses patients' physiological, psychological, social, and spiritual needs. Various therapies like chemotherapy and radiation therapy aim to enhance the quality of life. While effective for some, patients should be aware of non-pharmacological interventions. This capstone project aims to educate palliative care patients on music therapy's benefits, which can improve their quality of life. Studies show reduced stress and pain levels, along with increased spiritual support. A music therapy handout was created for patients, emphasizing its benefits. This will raise awareness and understanding of an alternative non-pharmacological intervention to enhance patient well-being. Further research on music therapy across diverse populations is necessary due to varying patient demographics, which can result in divergent findings.

Education for Parents on How to Administer IV Antibiotics at Home Using a Tunneled Catheter

Jenna Scarella

Faculty Mentor: Bianca Robertson

Egan School of Nursing & Health Studies

Booth: 115

Abstract:

The administration of intravenous (IV) antibiotics at home using a tunneled catheter presents a unique challenge that requires comprehensive education and support for parents. Pediatric oncology patients with indwelling central venous catheters (CVCs) who require a course of antibiotics but are otherwise stable may be discharged home. However, pediatric hematology/oncology units often lack a step-by-step guide for parents on how to administer these antibiotics themselves. Improper use of these CVCs increases the potential of bloodstream infections. To prevent infection, parents and caregivers require clear instruction on how to use their child's tunneled catheter once they have been discharged home. With proper instructions, there is no difference in the rate of CVC complications between nurses and caregivers (Curley et al., 2021). In order to improve education, a printable 10-step instruction guide was created for parents to take home and refer to while administering their child's antibiotic.

Language Barriers in Bedside Nursing Practice

Maeve Skillin

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 116

This research was also presented at 37th Alpha Mu Gamma National Convention in Chicago, March 2024

Abstract:

Language barriers present significant challenges in bedside nursing practice as they impact patient outcomes, treatment, and safety. This project examines the effects of language barriers on patient experiences and nursing care. It addresses the problems nurses have while interacting with patients who speak different languages which includes getting precise medical histories, explaining treatment plans, and offering emotional support. This project also explores how language challenges may affect patient safety by causing medical errors from miscommunication. It explores methods for bridging language gaps in bedside nursing practice such as using translators, providing linguistic aids, and educating nurses on therapeutic cross-cultural communication. Through proper language barrier management, healthcare facilities can improve the quality of care provided to diverse patient populations which will inevitably improve patient outcomes.

The Effectiveness of CHG Baths for Patients with Central Lines

Alyssa Sousa

Faculty Mentor: Michele Lecardo

Egan School of Nursing & Health Studies

Booth: 117

Abstract:

Patients with central lines are found to be across all healthcare settings. However, one of the main complications of a central venous catheter is a central line-associated bloodstream infection (CLABSI). CLABSIs are a nosocomial infection that develops within 48 hours of the placement. One way to diminish the risk of this infection is by performing daily 2% chlorhexidine gluconate (CHG) baths. There is a protocol for the daily use of CHG wipes on patients who have central lines at a local community hospital. On the general medicine unit, it appears as though the nurses aren't always compliant in completing this task. An infographic was created for the unit nurses that includes information regarding the benefits of implementing the use of daily chlorhexidine baths on all patients with a central line. Educating the staff on this topic is crucial to decrease the rates of central line-associated bloodstream infections within the hospital.

Clearing The Air: The Dangers Adolescent Vaping and its Persistent Health Risks

Emma Sweeney

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 118

Abstract:

Across the country, e-cigarette use, also known as vaping, has dangerously capitulated the adolescent population and is threatening the health of millions in our growing population. Within e-cigarettes, the highly addictive concentrations of nicotine pose a significant danger to the growing adolescent brain. Young individuals are drawn to vaping for various reasons, such as its affordability, potent nicotine content, and enticing marketing campaigns featuring vibrant flavors. Peer exposure has resulted in the presumptions of misinformation, contributing to a heightened prevalence of vaping among adolescents. In 2022, the U.S Food and Drug Administration in partnership with the U.S. The Centers for Disease Control and Prevention found that an alarming 2.55 million students from both middle and high schools reported the use of e-cigarettes in the past 30 days (CDC, 2016). Over the last 20 years, the nation has had a steady decline in the use of cigarette and tobacco products due to the emergence of vaping products as a “safe” alternative. As these products persist in a relatively new industry, the long-term health effects are largely unknown. However, it has been understood that the use of tobacco products among youth is incredibly unsafe. While observing a pediatric short-stay unit in a large urban hospital, two separate patients demonstrated this notion as they were experiencing medical ailments directly associated with vaping. Neither of these patients understood that their use of e-cigarettes posed a significant risk to their health before hospitalization. This capstone project strives to emphasize the medical danger that e-cigarettes pose to our adolescent populations and their need for education on health effects and cessation strategies to prevent future complications.

Nursing Actions to Enhance Patient Comfort in Nonverbal Young Adults

Madison Talbot

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 119

Abstract:

Effective communication is a nursing priority, particularly when addressing the needs of nonverbal young adults. Communication barriers can significantly impact patient comfort and the overall healthcare experience. A comparison for the use of a communication board or gestures on patient comfort among nonverbal young adults warrants exploration. This project aim is to compare the impact of communication boards versus gestures on patient comfort in nonverbal young adults identified within the literature. A literature review in PubMed and CINAHL using the keywords nonverbal, young adults, communication boards, gestures, patient comfort, and nursing care provided evidence on the topic. Both communication boards and established gestures play significant roles in enhancing patient comfort among nonverbal young adults. Communication boards offer a structured and visual means of communication, allowing for clarity and comprehension of messages. Conversely, gestures facilitate nonverbal communication, potentially fostering a sense of connection and rapport between patients and healthcare providers. The comparison of impact between the two approaches remains inconclusive. Nursing care for nonverbal young adults necessitates tailored communication approaches that consider individual preferences and needs. While both communication boards and gestures offer valuable means of communication, further research is needed to determine their comparative effectiveness in enhancing patient comfort. Nurses are instrumental in assessing patient preferences, implementing appropriate communication strategies, and continuously evaluating their impact on patient comfort and overall health status outcomes.

Pre-Chemotherapy Education Protocols to Reduce Chemotherapy Hypersensitivity Reactions (HSRs) in the Oncology Patient

Molly Thompson

Faculty Mentor: Mary Anne Caserta

Egan School of Nursing & Health Studies

Booth: 120

This research was also presented at the National Student Nurse's Association Annual Convention Orlando, April 2024

Abstract:

A medical professional hears the words “nausea”, “vomiting”, “stomatitis”, “bone pain”, “fatigue”, “low blood counts”, and “weight loss”, and immediately can identify these as common chemotherapy-induced hypersensitivity reactions (HSRs). Chemotherapeutic agents and their associated hypersensitivity reactions are an integral part of a medical professional’s oncological education. Jamie S. Myers, MN, RN, AOCN, reports that “almost all chemotherapeutic agents have been documented to cause HSRs in a small percentage of the population” (Myers & Kearney, 2000, 53). But, to what extent does this education extend to the oncology patient? Regardless of the type of care, procedure, or treatment a patient is receiving, patient education is of the utmost importance in healthcare. This is especially true regarding oncology services, where aggressive disease treatment regimens can take an extremely negative toll on the body - all while simultaneously fighting off cancerous cells as expected. In a study evaluating patients’ knowledge of their chemotherapy regimen, expected adverse effects, and their ability to manage them, Thao K Huynh, PharmD and James A. Trovato, PharmD, MBA, BCOP, FASHP make the claim, “Patients are not knowledgeable about how to self-monitor for chemotherapy-related adverse effects, including when to expect them and how to manage them effectively at home” (Trovato & Huynh, 2014, 122). How do we fix this problem for oncology patients? The answer is relatively simple - pre-chemotherapy treatment education protocols. Zümrüt Akgün Şahin & Seher Ergüney support this claim, basing their knowledge on data from a study conducted regarding education’s effect on symptom management in oncology patients receiving chemotherapy. Data shows “statistically significant decreases” in frequency, severity, and discomfort levels of several common chemotherapy-induced HSR symptoms after providing planned education to patients prior to treatment. (Akgün & Ergüney, 2015, 101). Pre-treatment protocols requiring detailed patient education regarding treatment regimens, adverse reactions, and how to manage these reactions could be the change needed to improve patient outcomes in oncology.

Ostomy Education: Participation & Acceptance

Anna Vene

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 121

Abstract:

Ostomies are a growing surgical procedure following colon and intestinal health concerns in order to combat issues throughout the gastrointestinal tract. Abdominal ostomies can be beneficial for fighting GI bleeding and altered elimination, but the adjustment to this new external stoma may be tough for patients. On a surgical unit, an increase in stomas was noted and suborned that this is an area that would benefit form growth in patient education. Early education and active participation in the ostomy care from patients will ensure proper care by the patient when discharged from the hospital or acute inpatient healthcare setting. Education can also help early acceptance to this drastic life change, especially older adults.

Key Words: Ostomy, Education, Participation

Educating Veterans on Use of a Mobile Application for Smoking Cessation

Anna Volkman

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 122

Abstract:

Smoking cessation interventions are the accepted approach for improving health outcomes of veterans. The best time to introduce and start smoking cessation efforts can be effective during inpatient stays. Mobile applications (apps) have emerged as a convenient and accessible tool for aiding smoking cessation efforts, but their effectiveness within the veteran population remains understudied. During my time at a veterans hospital during my clinical rotations, I have found the prevalence of smoking in the veteran population. I've heard stories of people maintaining this habit for upwards of 50 years with no motivation to stop. Smoking cessation is talked about but never attacked with proactive tips and tricks that could be at the fingertips of veterans. Once a veteran refuses help with smoking cessation, the doctors give in to order a nicotine patch. An app to use on their phone while lying in their bed to pass the time will only aid in their ability to quit this addictive hobby. The literature talked about in this project will support the helpfulness that smartphone applications have provided in order to promote smoking cessation.

Risk Factors and Preventative Measures for Ovarian Cancer

Katie Zimmer

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 123

Abstract:

Ovarian cancer has a poor prognosis and high mortality rate due to late diagnosis and non-specific symptoms. The population this handout is targeting is women with cancer, especially breast cancer, as that puts them at higher risk of developing ovarian cancer in the future. A handout was developed to teach women about risk factors, prevention and symptoms of ovarian cancer. The established risk factors include older age, with the average diagnosis being between ages 60-65, family history of cancer or previous cancer diagnosis, genetics, late menopause, diabetes, and nulliparity. Preventative measures identified to help reduce risk include combination pill oral contraceptive use for over five years, pregnancy and breastfeeding, and surgical interventions such as a hysterectomy or oophorectomy. This project helps women with cancer identify their risk factors for ovarian cancer and provides information about prevention and symptoms. Keywords: Ovarian cancer, prevention, risk factors, and education

The Benefits of Skin-to-Skin Contact Between Neonates and Their Non-Gestational Parents

Avery Andrews

Faculty Mentor: Stephanie Caicedo

Egan School of Nursing & Health Studies

Booth: 124

Abstract:

Skin-to-skin contact, or kangaroo care, is encouraged by healthcare workers, like nurses, for neonates both in and out of the Neonatal Intensive Care Unit (NICU). Skin-to-skin contact has been shown to have many benefits which include the following: bonding, thermoregulation, reduced apneic and bradycardic spells, increased parental confidence, and stress reduction for both the baby and parent. Many first-time parents are unaware of the benefits skin-to-skin contact has on neonates. Non-gestational parents are a crucial component in skin-to-skin contact and should understand its benefits. During my rotation in NICU, many non-gestational parents were seen not to be engaged in this type of care. Lack of participation from non-gestational parents is thought to be due to insufficient education. This project's evidence-based literature aims to educate non-gestational parents about the benefits condensed into a handout for easy understanding.

The Importance of Cervical Collars for Trauma Patients

Samantha Andrews

Faculty Mentor: Hannah Zhang

Egan School of Nursing & Health Studies

Booth: 125

Abstract:

The cervical collar has been a part of the prehospital routine since the 1960s. Cervical collars are placed for multiple different reasons such as when a patient has been in an accident, has an altered level of consciousness, and has neck or back pain (Braithwaite and Kane, 2022). The Emergency Department utilizes cervical collars to prevent a secondary spinal injury in addition to the injuries the patient comes in with. The purpose of cervical collars is to stabilize the cervical spine by preventing any rotation of the patient's neck (Schottke, 2018). Patients are often frustrated and confused as to why they have to wear such an uncomfortable collar. Without the use of cervical collars, the patient's condition could worsen to a spinal cord injury. Depending on the severity, this would impair the patient's activities of daily living and could cause paralysis (Sousa, et. al., 2023). There continues to be a need to educate patients on the importance of cervical collars in the Emergency Department to better improve patient care and understanding.

Care of an Infant With Neonatal Abstinence Syndrome

Brynn Burke

Faculty Mentor: Katherine Winkle

Egan School of Nursing & Health Studies

Booth: 126

Abstract:

Neonatal abstinence syndrome (NAS) affects infants who are born after being exposed to opioids in utero. These infants require specific care that is important to their survival and growth. Due to the high admission rate of the NAS infant on the pediatric unit during this clinical rotation, it was vital that all nurses had the knowledge of how to care for this patient. With a wide variety of patients on the unit, it can be difficult to organize and recall specific care that these infants need. This capstone project was developed to help experienced nurses, new graduate nurses, and nursing students review the care that is needed for the NAS infant when they have this patient within their assignment. An extensive literature review was completed and found that the Eat, Sleep, Console Care approach is best practice when caring for this patient population. In addition, the second major point that was found proved that breastfeeding is considered best practice in terms of feeding due to its ability to decrease the severity of withdrawal symptoms. The literature review revealed that further research can be done related to infants who develop skin irritation due to opioid withdrawal as well as an approach to breastfeeding if maternal custody is taken away.

The Need For Effective Communication In Intubated And Alert Patients

Melissa Fernandes

Faculty Mentor: Marialena Bazzano

Egan School of Nursing & Health Studies

Booth: 127

Abstract:

Communication is at the centerfold of what allows efficient and optimal delivery of healthcare. For years, patients in hospitals all over the country have faced challenges with effectively communicating their needs and desires while hospitalized. The Intensive Care Unit (ICU) is one setting where there is an abundance of barriers to communication that must be overcome by patients and caregivers. Many patients in critical condition have a need for assisted breathing with a device called an endotracheal tube, which bypasses their vocal cords. With this device patients are unable to speak, thus impairing their ability to communicate and advocate for themselves. These barriers leave patients and their families feeling helpless and silenced. Nurses can be educated on the options we can offer to patients that will improve communication, by viewing the educational infographic. The infographic will be easily visible and accessible to nurses and their patients. Having the ability to communicate about healthcare wishes as well as pain and symptom control, improves outcomes for emotional and physical health. Communication is of the utmost importance in the healthcare setting, and we must continue to facilitate these techniques to optimize patient care in the ICU. Keywords: communication, ICU, respect, barriers

Language Barriers Between Nurses and Patients in the Emergency Department

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Egan School of Nursing & Health Studies

Booth: 128

This research was also presented at the National Student Nurses' Association's 72nd Annual Convention

Abstract:

Nurses working in Emergency Departments (EDs) care for patients speaking a multitude of languages, with 62% of US non-English speakers reporting their primary language as Spanish (Dietrich & Hernandez, 2022). In New Haven, Connecticut, people who speak a language other than English (LOTE) surpass the national average, with approximately one-third of the city's population being LOTE speakers (U.S. Census Bureau, 2022). New Haven's diverse population highlights the critical need for robust language interpretation resources in healthcare settings. Although the rise of video interpreters helps to mitigate this problem (Schulz et al., 2015), healthcare workers still face barriers to using these services, especially in time-sensitive situations (Brenner et al., 2018). A clinical experience in a large urban hospital revealed the underuse of translators. To help bridge the gap in the patient-nurse language barrier, a reference card was created with the Spanish translation of common medical phrases to be added to employees' identification badges. Coined "badge buddies," these reference cards have proven to be successful in improving patient outcomes (Silverman, 2023) (Garcia et al., 2023). This tool provides nurses with basic medical vocabulary to initiate a therapeutic relationship with Spanish-speaking patients in time-sensitive situations and will help improve patient outcomes.

The Benefits of a Meditation App for Oncology Patients

Kaitlyn Nolan

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Egan School of Nursing & Health Studies

Booth: 129

Abstract:

While observing an oncology unit, it was noted that cancer patients experience anxiety or stress, impacting their quality of life and independence. It was evident that these patients required mental health support. Meditation, a powerful, non-pharmacological intervention alleviates these symptoms through guided breathing and focused attention (Orasud et al., 2024). The use of a meditation app on smartphones is an accessible way to practice mindfulness anytime, anywhere. Smartphone usage is prevalent among cancer patients, who express a willingness to use a meditation app (Huberty et al., 2020). Recent studies showed meditation having a positive impact on depression, anxiety, and quality of life in patients with ovarian cancer, men living with cancer, and patients with metastatic non-small cell lung cancer (Orasud et al., 2024). To address this learning need, a flyer was developed, providing the benefits of a meditation app, with a QR code directing to the Calm app.

Communication is Key: Spanish-Speaking Patients Face Language Barriers in the Hospital Setting

Bailey Taylor

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Egan School of Nursing & Health Studies

Booth: 130

Abstract:

In observing the nurse and patient interactions on the unit, barriers in language and communication led to miscommunication for Spanish-speaking patients. In the past ten clinical weeks, there was one shift with a Spanish-speaking nurse. Consequently, all five of the Spanish-speaking patients that were interviewed expressed frustration with their healthcare communication. Therefore, there was a genuine need to advocate for this patient population. The five scientific literature articles presented in this capstone project further support the need for improved communication between nurses and patients. One qualitative study performed in a hospital indicated that “language barrier was also a significant problem in written communications. Medication instructions were sometimes provided exclusively in English” (Nageswaran et al., 2021). The lack of resources for Spanish-speaking patients leads to medication miscommunication and risks patient safety. To improve nurse-patient communication, the new screening questionnaire addresses the patient’s language, technology abilities, disabilities, mental health needs, and additional concerns. Furthermore, the poster illustrates what the individual on the healthcare team can do to improve communication and overall patient experience. Overall, clear, complete communication between the healthcare team and the patient is imperative to provide quality care, develop strong nurse – patient relationships, and decrease rehospitalizations due to miscommunication in medications and discharge instructions.

The Importance of Disinfecting Needleless Connector Hubs

Isabel Barahona

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 131

Abstract:

A bloodstream infection in peripheral intravenous catheters (IV's) occurs when bacteria enter the bloodstream through the insertion site of the peripheral IV catheter. This can happen if the needleless connector hub, which connects the IV tubing to the catheter, is not properly disinfected before use. Proper disinfection of the needleless connector hub is crucial because it helps prevent the introduction of bacteria into the bloodstream. Failure to “scrub the hub” increases the risk of bloodstream infections, which can lead to complications such as sepsis or septicemia, especially in vulnerable patients. This capstone project examines five studies, all at various levels, that highlight the importance of disinfecting the needleless connector before use. Recent studies highlight the prevalence of microbial colonization and infections associated with peripheral venous catheters when aseptic techniques are not rigorously followed. Through various methodologies and findings, they emphasize the significance of adherence to scrubbing protocols to mitigate the risk of bloodstream infections, improve patient safety, and enhance the quality of intravenous therapy in healthcare settings. Nurses on the units require a thorough review of protocols for scrubbing the hub to ensure infection prevention, as there is a notable lack of adherence, leading to heightened risks of bloodstream infections among patients.

Educating Families to Improve End of Life Care

Caroline Beal

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 132

Abstract:

This project aims to educate families using the Three Wishes Project (3WP) to improve and personalize end-of-life care for patients. Despite advancements in care, hospitals often fail to provide optimal end-of-life care for inpatients with terminal illness. The literature emphasizes the necessity for personalized patient-centered care at life's end and highlights the success of the 3WP in various healthcare settings, significantly impacting families' well-being. This initiative improves the end-of-life experience for patients and their relatives and empowers nurses and care teams, enhancing the overall quality of care and supporting emotional resilience in facing the realities of death and dying. To educate families, a pamphlet was created to explain the purpose of the 3WP, provide information on feasible wishes, and highlight supportive services that are available to improve and individualize end-of-life care.

SafeHaven: The Use of Reminiscence Therapy as a De-Escalation Strategy for Dementia and Alzheimer (Vulnerable) Hospital Patients

Nicole Black

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 133

Abstract:

Approximately 6 million Americans aged 65 and older have Alzheimer's disease and related dementias (ADRD), and this number is projected to more than double by 2060. This serves as a pressing problem due to the debilitating effects on memory, cognitive and daily functioning, ultimately impairing one's quality of life. The increase in aging adults and the increased incidence of ADRD is demanding a crucial need for an aptly trained and educated healthcare workforce and non-pharmacological interventions. The use of Reminiscence Therapy is an effective non-pharmacological tool that caregivers can use to help prevent crisis and mitigate behavioral risks to enhance the overall well-being and quality of life for individuals suffering from dementia daily.

Benefits of a Pressure Injury Prevention (PIP) Badge-Tag for Healthcare Providers

Devan Cargnel

Faculty Mentor: Karen Nicolas

Egan School of Nursing & Health Studies

Booth: 134

Abstract:

Pressure injuries (PIs) are a significant concern in nursing, often regarded as a visible sign of negligence by healthcare providers. However, healthcare professionals argue that PIs are the result of broader systemic issues within healthcare. There is a wealth of literature that supports the utilization of evidence-based interventions and reference sheets within the medical field. This project aims to explore the utilization of evidence-based interventions and resources in addressing PIs, focusing on the Pressure Injury Prevention badge-tag, or PIP Tag. The PIP Tag serves as a guide for preventing PIs or the staging progression of PIs in patients with limited mobility or those requiring long-term medical device usage. The PIP Tag is a novel tool that supports healthcare professionals in implementing the latest best practices in PI staging accuracy and most ideally, PI prevention techniques.

Nursing Interventions to Help Facilitate a Vaginal Delivery

Fran Gage

Faculty Mentor: Amy Wargo

Egan School of Nursing & Health Studies

Booth: 135

Abstract:

This project aims to address the increasing rates of cesarean sections (C-sections) and associated maternal complications by focusing on nursing interventions using the peanut ball, a popular birthing tool. With C-section rates soaring by 60% over the past 25 years, reaching 32.1% in the US in 2021 and 35.2% in Connecticut in 2022, there's a pressing need to promote vaginal delivery as the safest option for both mother and fetus (March of Dimes). Medicalization of childbirth and patient preference for C-sections contribute to this trend, despite evidence linking C-sections to higher maternal risks. Studies suggest that the use of peanut balls can increase rates of spontaneous vaginal deliveries and decrease rates of C-sections (Grenvik et al., 2019). This project involves creating educational materials and tools for nurses to effectively utilize peanut balls in assisting optimal positioning of the baby in the pelvis, thereby facilitating vaginal delivery and reducing the reliance on C-sections.

Optimizing Patient Outcomes: Insulin Infusion Protocol Proficiency in the Surgical Intensive Care Unit

Stephen Hayes

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 136

Abstract:

This capstone project addresses the need for refresher training among nurses in the Surgical Intensive Care Unit (SICU) to enhance hyperglycemia management using their facility's insulin infusion protocol. This educational requirement was identified through a comprehensive evaluation, which included observation and interviews with SICU nursing staff. The proposed refresher training program aims to bolster nurses' comprehension of insulin infusion protocols, strengthen adherence to best practices, enhance proficiency in glucose monitoring techniques, and foster awareness of potential complications. Extensive literature review highlighted hyperglycemia's association with increased mortality as well as cardiovascular, respiratory, neurological, and infectious morbidity in the SICU environment (Duncan, 2012; Lai et al., 2022; Van den Berghe et al., 2001). This project underscores the significance of continuous education and skill refinement to ensure the safe and effective management of hyperglycemia in the SICU environment, ultimately improving patient care and outcomes.

Prevention of Central Line Bloodstream Associated Infection In An Adult Oncology Unit

Stephanie Okoli

Faculty Mentor: Mary Anne Caserta

Egan School of Nursing & Health Studies

Booth: 137

Abstract:

Central Line-Associated Bloodstream Infection (CLABSI) remains a significant concern in healthcare, with detrimental impacts on patient outcomes and increased healthcare expenditure. In an adult oncology unit where most patients are immunocompromised, neutropenia may heighten the risk for CLABSI, posing a serious threat to patient safety. This capstone project endeavors to enhance nursing staff proficiency by educating them on the latest CLABSI protocols and implementing a comprehensive checklist at the nurses station. The utilization of this checklist ensures uniformity in care delivery across all shifts and varying levels of experience within the oncology unit. Emphasizing the necessity of ongoing nursing education and evidence-based practices, this project underscores the imperative of addressing patient safety issues such as CLABSI through proactive measures within clinical settings.

The Importance of Being Proactive to Promote Adequate Sleep in the Inpatient Setting

Chanee Owens

Faculty Mentor: Jessica Marraffa

Egan School of Nursing & Health Studies

Booth: 138

Abstract:

In the high-acuity patient care setting, where numerous critical aspects of care demand attention, ensuring adequate sleep for patients can sometimes be overlooked, despite its recognized importance for recovery and patient health outcomes. Existing research underlines both the detrimental effects of sleep disturbances and the positive outcomes of targeted educational initiatives aimed at improving sleep. Through the development of an educational brochure, hospitals can equip patients and their families with the knowledge and tools necessary to initiate productive dialogues with healthcare teams concerning effective strategies for enhancing sleep quality. This initiative, drawing upon empirical evidence demonstrating the efficacy of similar interventions, seeks to integrate sleep quality into the broader framework of comprehensive patient care on the oncology unit. The ultimate objective is to improve patient satisfaction and health outcomes by making patients aware of nonpharmacological treatments and hospital resources, such as relaxation techniques and environmental modifications, that can facilitate better sleep and overall better patient outcomes.

Best Practice Advisory Alerts for Stroke Assessments in the Emergency Department

Megan Swenton

Faculty Mentor: Hannah Zhang

Egan School of Nursing & Health Studies

Booth: 139

Abstract:

Recently there have been issues in the Emergency Department of a busy Level One trauma center with neurological assessments not being conducted timely for stroke patients. Nurses have assumed care of patients from the previous shift and, upon a chart review after change of shift report, have discovered the ordered neurological assessments have not been conducted throughout the previous shift. A review of the literature was conducted to determine the effectiveness of adding a Best Practice Advisory (BPA) alert to Epic within the patient chart that would prompt the nurse to perform the assessment. The literature shows BPA alerts can be effective in changing clinician behavior when implemented correctly. Important information should be presented in an active format using information from the patient chart and requiring action by the clinician (Valvona et al., 2020). Due to the time sensitive nature of strokes, neurological assessments could be presented in an active BPA format which could help increase timeliness of assessments.

Hepatic Protection in Intravenous Acetaminophen for Postoperative Patients vs Oral Acetaminophen

Dayle Wade

Faculty Mentor: Mary Murphy

Egan School of Nursing & Health Studies

Booth: 140

Abstract:

Compared to oral Acetaminophen, IV Acetaminophen reduces initial hepatic exposure by approximately twofold because of the lack of first-pass metabolism. Reduced hepatic exposure to IV Acetaminophen thus improves its safety profile and may benefit patients with compromised hepatic function. IV Acetaminophen passes through the systemic circulation in cerebrospinal fluid and lastly goes through the hepatic artery. Because it does not directly pass through the liver it causes less injury. The benefit of IV Acetaminophen is postoperative patient pain was better managed, and opiates were utilized less. IV Acetaminophen has fewer side effects than opiates, so it is becoming utilized more. A physical handout was created and given to newly licensed registered nurses in the nurse residency program at a large urban hospital. It can be referred to when caring for a patient during a shift to improve patient engagement and health outcomes. Professional documentation supports best practices and high-quality patient care. Nurse educators can utilize this piece of educational information for future nurse residency participants.

Improve Understanding and Uptake of Palliative Care Using Education Materials for the Patient and Family

Dimitri Willert

Faculty Mentor: Mary Anne Caserta

Egan School of Nursing & Health Studies

Booth: 141

Abstract:

While all RNs can be considered primary palliative care providers, many patients experiencing serious illness would benefit from the care provided by a specialized palliative care team. Unfortunately, mentioning this term makes many patients uncomfortable and brings to mind the concept of “giving up” on their own life and curative treatments. Nevertheless, when specific treatments are proposed which focus on the patient’s quality of life they are frequently embraced, and then produce better outcomes the sooner they are initiated. While providers of palliative care are skilled at explaining the nuances of these treatment plans, additional literature targeted to the patient and family can provide an off-line opportunity, outside of the emotional experience of speaking to providers, to digest the concept and comprehend a treatment modality which focuses on the patient’s comfort and quality of life.