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RESEARCH WEEK PROCEEDINGS

"A Celebration of Student Research"

April 8-13, 2019



OFFICE of
RESEARCH &
GRADUATE STUDIES

Research Week 

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Behavioral Sciences

Who Is Truly Responsible For One's Health?

Contreras, Kayla M.; University of the Incarnate Word

Velez, Nataly; University of the Incarnate Word

Soukup, Gregory J., Ed.D.; University of the Incarnate Word

Lopez-Rodriguez, Erlinda, DrPH.; University of the Incarnate Word

Mission Driven Research

The mission of Incarnate Word states “a Catholic institution that welcomes to its community persons of diverse backgrounds, in the belief that their respectful interaction advances the discovery of truth, mutual understanding, self-realization, and the common good” which reflects the purpose of the study. The study embodies children with diverse backgrounds, the respect of the community and environment, and the goal is to reach common good within the children and their families.

Project Abstract

Purpose: The purpose of the study was to gain an understanding about youth intent engaging in healthy eating based on attitude.

Rationale and Significance: The number of youths globally living with chronic illness due to obesity is increasing. Youths engaging in unhealthy eating habits contribute to the adverse outcomes facing public health such as, type two diabetes, cardiovascular disease, cancer and other health issues. According to the Texas Skills and Knowledge guidelines, students should know ways to enhance and maintain personal health throughout the lifespan. However, nutrition is not a required component in the elementary education in the state of Texas. More specifically, each school system determines how to best teach age appropriate information about personal health habits which includes nutrition. This begs the question who is truly responsible for one's health. Little is known about behavioral intent for engaging in healthy eating among this age group. The theory of planned behavior is an applicable model that addresses several predictors of

intention and subsequent behavior. The theory suggests that attitude toward the behavior predict intention to perform the behavior. Attitude is an overall evaluation of a specific behavior. Attitude includes of two components: belief about the consequences of the behavior and the corresponding judgment about the behavior. Research suggest that people's attitudes strongly affect the choices they will make.

Methodology: Pre-posttest design based on the theory of planned behavior to measure the impact of intent based on attitude to engage in healthy eating were administered to 5th graders in South Texas. Data was collected prior the first lesson and during the last lesson. All students enrolled at the elementary school participated in the lesson however only those students (n=97) with parent consent participated in the survey. The nutrition lesson was provided over 14 weeks three times a week to ensure all students received the lesson. Each lesson took approximately 30-40 minutes to complete.

Findings: Data analysis consisted of paired sample t-test and multiple regression analysis. The research study used a significance level of .05 to assess the statistical significance for the standardized coefficients. To isolate the effect of participating in the 14 nutrition lessons on intention to engage in healthy eating based on attitude as a predictor a paired sample t-test was performed. Change in attitude ($t=2.059$, $df=72$, $p=.043$) was statistically significant. The multiple regression model had an adjusted $R^2=.73$, indicating that 73% of the variance in the dependent variable was explained by the model. Coefficients for change in attitude toward engaging in healthy eating were statistically significant. Poor eating habits established early in childhood are often maintained throughout an individuals' life span contributing to the poor health outcomes. Gaining an understanding on behavioral intent based on attitude might help coordinate public health practitioners and school administrations to build nutrition activities within their current curriculum. Addressing attitude may help build self-efficacy which is also a predictor of behavior. Building self-efficacy may lead towards positive health outcome.

Behavioral Sciences

Criminal Thinking in Substance Dependent Female and Male Offenders Before and After Cognitive Behavioral Treatment in a Correctional Setting

Felix-Ortiz, Maria, PhD; University of the Incarnate Word
Garay, Lara, Holmes High School

Mission Driven Research

The correctional facility we studied is unusual because it offers rehabilitative services rather than focusing on retribution, the typical American model of corrections. We partnered with the facility staff to assist them in evaluating their substance abuse treatment program to show that it does achieve treatment goals of rehabilitation, (i.e., reduced criminal thinking and substance abuse). This focus on rehabilitation rather than retribution is consistent with the university's mission to minister to the sick and to promote social justice.

Project Abstract

Purpose: The purpose of our study was to determine whether the cognitive behavioral treatment (CBT) program in a community correctional facility reduced criminal thinking in a group of male and female "offenders" (hereafter called "residents") after 120 days of treatment. We compared men to women in treatment across 120 days and hypothesized that women would show more reductions in criminal thinking than men.

Rationale and Significance: Previous research suggests that gender differences in criminal thinking exist and are complex (Vaske, Gehrings, & Lovins, 2017), with many investigations showing lower criminal thinking scores in women. Some suggest that women's criminal thinking is qualitatively different from men's criminal thinking so women may show different elevations among criminal thinking scale scores. With a better understanding of women's criminal thinking scores, and how they differ from men's scores, we can offer more targeted treatment of criminal thinking in women, and reduce recidivism.

Methodology: We measured criminal thinking in 43 male and female residents of a local community corrections facility at admissions and at 120 days using

the TCU Criminal Thinking Scales (Knight, Garner, Simpson, Morey & Flynn, 2006). These scales include measures of Entitlement, Justification, Power Orientation, Criminal Rationalization, Personal Irresponsibility, and Cold-heartedness. Most men were about 20-31 years old, Hispanic, finished high school, and were full-time employed. Most women did not finish high school, were unemployed, and had an additional diagnosis. All residents were mostly single. We administered the English version of the scales in gender-segregated group administrations, reading the items aloud to residents after obtaining passive informed consent. We ran t-tests to compare women's scores at admission to their scores at 120-days, and we found that women's scores on Justification decreased significantly after 120 days of CBT ($t=2.55$ [$df=21$], $p<.05$); their score on this scale dropped 4 points. We similarly compared men's criminal thinking scores and found that Power Orientation was significantly reduced after 120 days of CBT ($t=2.23$ [$df=27$], $p<.05$); their score dropped 3 points. Power Orientation also dropped substantially among women, but was not statistically significant. However, Justification was not reduced at all among men as it was in women ($t=0.59$ [$df=27$], $p=.56$). In addition, Criminal Rationalization was slightly but significantly elevated after 120 days of CBT ($t=-2.60$ [$df=21$], $p<.05$); their score increased by 2 points.

Findings: These results support recent studies of gender differences that show qualitative differences in criminal thinking across men and women. After 120 days of CBT, Power Orientation is reduced among men and women, but Justification is reduced in women and not in men. Much to our dismay, Criminal Rationalization showed some elevation after 120 days of CBT among men. When reviewing the items, all suggest a distrust of the criminal justice system, and these beliefs may be inadvertently reinforced after a long stay in treatment. These elevations were not evident among women so more aggressive treatment of Criminal Rationalization is likely required for male residents.

Behavioral Sciences

Observing to Learn – Learning to Observe

Walker, Rachel, PhD; University of the Incarnate Word

Hill, Heather, PhD; St. Mary's University

Mission Driven Research

This research reflects the University's core values by expanding the communities knowledge on a variety of different species and contribute to the discussion of understanding non-human mammal behaviors. This study also examined the usefulness of training others outside of the university on these observational skills. Only by working collaboratively can we, as a community, better apprehend topics that can be used in a global discussion. We hope that through this presentation community members will be more educated and motivated to engage in this topic in the future. Finally, from this research we can explain how human care services focus on animal welfare.

Project Abstract

Purpose: Whether animals or people, behavior provides many insights with clear applications across a broad range of contexts. Behavior can inform humans about animal health, animal social tendencies, animal enrichment, animal food/habitat preferences, and overall animal well-being. The primary purpose of the multi-day workshop at the Animal Behavior Management Alliance (ABMA) conference was to train and provide experience, with several data collection techniques that can be used to evaluate animal behavior in both spontaneous and enrichment-provided settings, with the attendees. The purpose of this study was to examine if the weekly workshop assisted in learning multiple ways of systematically observing behaviors.

Rationale and Significance: The data collected informed the facilities of any behavioral patterns observed during the day as well as demonstrate the usefulness of different types of data collection depending on the question of interest. The final portion of this multi-day workshop allowed the attendees to share their experiences with the different techniques utilized across the two facilities. A post-workshop survey was also conducted.

Methodology: Prior to the first presentation at the conference, a survey was completed by attendees to indicate which observational techniques they are accustomed to and have utilized at their facilities. Attendees then were provided coordinated opportunities to practice observations during the training portion of the workshop. Following the training session, attendees participated in data collection at SeaWorld San Antonio and San Antonio Zoo. Each participant spent 20-min at one location each day collecting data. The 20-min period was split into two 10-min data collection periods in which attendees actively collected data using two different techniques during that collection. Each facility had 4 habitats that have been pre-selected for observations across the day. Attendees were asked to sign up for one 20-min slot at SeaWorld and one 20-min slot at San Antonio Zoo. The data was collected on paper and provided to each attendee at the observation location. Attendees returned the datasheets to a research assistant. The data was entered and summarized by the workshop leaders during the final portion of the workshop. Following the week long workshop a post-workshop survey was conducted.

Findings: A pre-workshop survey was given with approximately 177 individuals completing the majority of the survey. Almost a third (62%) reported using behavioral data collection to manage animal behavior prior to the workshop. Almost all participants had heard of a behavioral ethogram (91%) with the majority having used one before (68%). A post-workshop survey indicated that approximately 82 individuals completed the majority of the survey with 80% expressing being satisfied and highly satisfied with the workshop, 16% were neutral, and 3% were not satisfied. Almost 90% of the respondents on the post-survey reported that the instructions were clear. Overall, the workshop and the practice was a success. Knowledge about data collection procedures increased from before to after the workshop and application.

Behavioral Sciences

The relationship between cell phone use and personality in a sample of undergraduate students

Walker, Rachel, Ph.D; University of the Incarnate Word

Juarez, Erika; University of the Incarnate Word

Mission Driven Research

This research is important because it addresses what can affect the community as mostly everyone owns and uses smartphones. Furthermore, smartphone addiction or dependence can impact not only the addict but also the people around them. University of the Incarnate Word (UIW) believes students should receive noticeably distinctive education. Through their undergraduate research experience, students can learn the process of creating research, analyzing it, and most importantly, realize the impact research can have on the community. UIW's missions include valuing teaching, encompassing research, educating the community, communication of truth, and thoughtful innovation. The community will be able to recognize the risk factors and be attentive to not only their own behavior, but also others around them. This research is innovative because it emerges questions on topics that have not been examined in this way. This also coincides with social accountability, as this will involve people's health.

Project Abstract

Purpose: While previous research has measured the motives that have been associated with cell phone use (Leung & Weir, 2000) we explored the intensive use of smartphones and how it is related to personality. We are were also interested in investigating the relationship between sensation seeking and smartphone addiction. Testing personality will help determine what personality characteristics are more at risk and possibly target those to aid them.

Rationale and Significance: Cell phone use has substantially increased over the years. The Pew Internet and American Life project (PEW, 2018) indicate that ownership of smartphones has increased 35% in the last seven years. It appears that 77% of Americans tend to access the internet daily. What are these smartphones used for? The answer is anything and everything. PEW (2015) explored this question and found that there is a variety of situations that the smartphone is found useful

(i.e., finding health information, current events and news, online videos, social networking, phone calls, boredom, avoidance of others, etc.). Smartphones are continuing to be used for various purposes rather than only for productivity purposes. Within the diversity of the use of smartphones are there factors that can predict the types of use?

Methodology: While we are currently still in the process of collecting data we have completed a preliminary analysis to submit for this proposal. The participants for this study included 62 undergraduate students (11.3 % males, 88.7% females) at UIW. The age range of the participants was 18 – 33 with a mean age of 20.98 (SD = 2.46). The race of the participants were as follows: 62.9% Hispanic, 24.5 % Caucasian, 6.5% African American, and 6.5% of participants were from other ethnic groups. The percentage of the group made up of students included first-year students (6.5%), sophomores (32.3%), juniors (33.9%), and seniors (27.4%). Several variables were collected: Big 5 Personality Survey (5 factor), Mobile Phone Addiction (4 factors) and Sensation Seeking. Demographics were also requested.

Findings: Preliminary analysis indicated significant relationships between personality, and mobile phone addiction but not with sensation seeking. Extraversion and Agreeableness were positively correlated with the use of smartphones for withdrawing or escape. There was a negative relationship between Openness and our ability to control our craving for smartphone use. Finally, Neuroticism had negative relationships with feeling anxious without the smartphone, productivity loss and issues related to withdrawing from the smartphone.

Biological Sciences

SPOP as an Emerging Key Player in Breast Cancer Oncogenesis

Galindo, Esther; University of the Incarnate Word

Diab, Mariam; University of the Incarnate Word

Burleson, Marieke, PhD; University of the Incarnate Word

Mission Driven Research

This project reflects education and truth since it goes above and beyond the normal educational requirements of an undergraduate student through an independent research project, which in turn will allow for the communication of truth. Furthermore, the project also reflects faith and service since it directly serves a large number of people that suffer from a fatal disease. Finally, my research is highly innovative since we are utilizing cutting edge research to find novel treatment strategies for breast cancer patients.

Project Abstract

Purpose: A large fraction of breast cancer patients have downregulation of Speckle Type Poz protein (SPOP) which prompts the question about the mechanistic basis behind this and, moreover, if there is a superior therapeutic strategy for these patients. Based on our studies, we hypothesize that downregulated SPOP promotes GLI3-dependent Sonic Hedgehog (SHH) signaling and that the SHH pathway is therefore an attractive therapeutic target.

Rationale and Significance: Breast cancer is currently the second leading cause of cancer deaths among American women thereby highlighting the compelling need to uncover novel and superior treatment regimens for women suffering from this disease. Recent advances in genome-wide studies have allowed for the identification of cancer-related mutational landscapes, which allows for the identification of oncogenic alterations that are unique to particular cancer patients. Through this technology it has been uncovered that up to 37% of breast cancer patients have downregulated expression of SPOP thereby prompting our lab to study the mechanistic basis behind breast oncogenesis when SPOP expression is low.

Methodology: To study the effect of downregulated SPOP, a lentivirus carrying an shRNA against SPOP was generated and infected into MCF-7 (breast cancer) cells. Proliferation assays were utilized to confirm that downregulated SPOP plays a role in the increased proliferation of breast cancer cells. Finally, western blot and quantitative PCR was performed to determine the effect downregulated SPOP has on proteins that participate in important proliferation signaling pathways.

Findings: Our findings confirmed that downregulation of SPOP increases proliferation of breast cancer cells in vitro. Through western blot analysis it was determined that SPOP targets GLI3, a downstream effector of SHH signaling, for degradation through the proteasome pathway. Quantitative PCR then confirmed that GLI3 target genes are upregulated in cancer cells when SPOP expression is low. These findings demonstrate GLI3 protein is stabilized when SPOP is downregulated, which in turn activates GLI3 target genes that are important for cell proliferation. This further indicates that the GLI3-dependent SHH signaling pathway is an attractive therapeutic target for SPOP downregulated breast cancer patients.

Biological Sciences

MED12 Mutations Play a Pivotal Role in Breast Cancer Oncogenesis

Zemlyanaya, Alena; University of the Incarnate Word

Burleson, Marieke, PhD; University of the Incarnate Word

Mission Driven Research

This project reflects education and truth since it goes above and beyond the normal educational requirements of an undergraduate student through an independent research project, which in turn will allow for the communication of truth. Furthermore, the project also reflects faith and service since it directly serves a large number of people that suffer from a fatal disease. Finally, my research is highly innovative since we are utilizing cutting edge research to find novel treatment strategies for breast cancer patients.

Project Abstract

Purpose: MED12, a subunit of Mediator protein, has been found to be mutated in a significant portion of breast cancer patients. Previous work has shown that MED12 restricts GLI-3 dependent Sonic Hedgehog (SHH) signaling, a pathway that is often hyper activated in advanced breast cancer. The purpose of our study is to investigate if mutated MED12 promotes GLI3-dependent SHH signaling in breast cancer cells and whether this contributes to oncogenesis.

Rationale and Significance: There is a critical need for superior breast cancer treatment since this disease remains the second leading cause of cancer deaths among American women. Though radiation and chemotherapy have been the frontline choice of treatment for cancer over the past few decades, due to the detrimental side effects, personalized treatment is rapidly rising as a superior treatment method. This is largely due to recent advances in genome-wide DNA sequencing that have allowed for the identification of cancer-related mutational landscapes. Through these technologies, MED12 has been found to be commonly mutated in a large number of breast cancer patients. Therefore, uncovering the mechanistic basis behind MED12 mutant breast cancer is critical in order to find a personalized treatment regimen for this subclass of breast cancer.

Methodology: To study the effect of mutant MED12, a lentivirus carrying an shRNA against MED12 was generated and infected into MCF-7 (breast cancer) cells. Since the vast majority of breast cancer-associated MED12 mutations lead to loss of protein function, the knockdown strategy through lentiviral shRNA is assumed to mimic the MED12 mutant setting. Proliferation assays were utilized to confirm that downregulated MED12 plays a role in the increased proliferation of breast cancer cells. Finally, quantitative PCR was performed to determine the effect downregulated MED12 has on the expression of proliferation genes that are known to be regulated by GLI3.

Findings: Our findings confirmed that downregulation of MED12 increases proliferation of breast cancer cells in vitro thereby providing a strong argument that mutant MED12 would have the same effect. Through quantitative PCR it was confirmed that GLI3 target genes are upregulated in cancer cells when MED12 expression is low. These findings demonstrate that downregulated MED12 activated GLI3 target genes that are important for cell proliferation. This further indicates that the GLI3-dependent SHH signaling pathway is an attractive therapeutic target for MED12 mutant breast cancer patients.

Biological Sciences

HPLC Analysis of the Products of Fungal Biotransformation of Praziquantel by Cunninghamella elegans, Umbelopsis ramannianus, and Yarrowia lipolytica Metabolism

Chivers, Samuel, MS; University of the Incarnate Word

Carvalho, Paulo, PhD; University of the Incarnate Word

Garza, Victoria; University of the Incarnate Word

Vallor, Ana, PhD; University of the Incarnate Word

Mission Driven Research

My research focuses on finding a treatment for the tropical disease of Schistosomiasis. Aims that are similar to the first sisters of the incarnate word who started this institution. Many individuals that are afflicted with this disease are often poor and live in developing countries. My research will go towards helping those that can not help themselves. I believe this is in line with both the UIW Mission and catholic social teachings of helping people.

Project Abstract

Purpose : Overall this investigation aimed to use fungal biotransformation as a viable method to produce novel derivatives of Praziquantel, the only treatment for Schistosomiasis, which can be further engineered into more effective alternate treatment options for the disease. Derivatives both documented and novel, with different, and hopefully improved, biological activities. Specifically, this study examined the efficacy of four fungal strains, *Cunninghamella elegans* (ATCC 9245 and ATCC 8688a), *Umbelopsis ramannianus*, (ATCC 9628) and *Yarrowia lipolytica* (ATCC 20225), in the biotransformation of Praziquantel.

Rationale and Significance: Schistosomiasis is a neglected tropical disease rampant in developing countries, affecting approximately 207 million people. The widespread chemotherapy is reliant on a single drug, Praziquantel. Heavy reliance on a single drug increases the risk of resistance, there is an urgent need for the development of new derivatives in order to circumvent this. Fungal biotransformation of organic compounds is a well-documented tool in the pharmaceutical synthesis of new drugs, thus should be able to produce novel metabolites, derivatives of the parent molecule, which can be used to create more effective and alternate treatment options.

Methodology: Fungal mycelia were cultured for 48 (h) in 125 mL of HiMedia, Yeast-Mold, (YM) broth medium, at 28°C with constant agitation, 180 rpm. After this each culture was dosed with 0.05g of Praziquantel suspended in 1.25mL of acetone, 40mg/ml, and grown for a period of 5, 10, or 15 days post inoculation. At each time point the mycelia were filtered using a vacuum filtration apparatus and filter paper, with a 20 to 25µm particle retention, washed with water and discarded. Culture broth containing the metabolites were extracted with three equal volumes of 100ml ethyl acetate. High Performance Liquid Chromatography was used to ascertain the level of metabolization of Praziquantel.

Findings: Preliminary results of this analysis demonstrate that *C. elegans*, ATCC 8688a, fully metabolizes praziquantel after 15 days producing major peaks at 4.7 and 4.3 minutes. After 15 days *C. elegans*, ATCC 9245, had metabolized the majority of Praziquantel producing major peaks at 4.7 and 4.3 minutes. *U. ramannianus*, ATCC 9628, fully metabolizes Praziquantel after 10 days producing major peaks at 4.9 and 4.5 minutes. *Y. lipolytica*, ATCC 20225, shows negligible metabolic activity. The Praziquantel peak remained relatively unchanged at 8.1 minutes for each time course. All of these major peaks are assumed to correspond with Praziquantel metabolites. Purification of the mixture and further testing, such as Nuclear Magnetic Resonance and mass spectrometry, is required to identify the metabolites obtained

Biological Sciences

Metabolic Product Investigation of the Fungal Biotransformation of Praziquantel by Aspergillus fumigatus Using HPLC Analysis

Garza, Victoria; University of the Incarnate Word

Carvalho, Paulo, PhD; University of the Incarnate Word

Chivers, Samuel, MS; University of the Incarnate Word

Vallor, Anna, PhD; University of the Incarnate Word

Mission Driven Research

The overall mission of this project aligns with both those of UIW and Catholic social teachings. The research focuses on finding a treatment for the tropical disease of Schistosomiasis. Striving to improve conditions for those who don't have the resources to help themselves. Additionally, this project represents a research collaboration with both the School of Mathematics, Science and Engineering and the Feik School of Pharmacy where faculty and other students support each other within this research group.

Project Abstract

Purpose: Fungal biotransformation of organic compounds is a well-documented pharmaceutical tool in new drug synthesis. By subjecting Praziquantel, the only treatment for Schistosomiasis, to this process this study aims to establish fungal biotransformation as a viable method to produce novel derivatives both documented and novel, with different, and hopefully improved, biological activities when compared to the parent molecule. Such that these derivatives can be further engineered into more effective alternate treatment options for the disease. This investigation compared the activity of, and subjected praziquantel to, two fungal strains: *Aspergillus fumigatus* ATCC MYA-4609 and ATCC 1022.

Rationale and Significance: Schistosomiasis is endemic to 72 tropical and, primarily, developing countries; preventative treatment is required for 52 of these. Praziquantel is both effective and readily available and is singly relied upon for widespread chemotherapy. However, praziquantel is a racemate mixture and only the anthelmintic activity is only associated with the R-(-)-enantiomer. Additionally, such extensive use on a single drug increases the risk of further resistance and tolerance development. Exposing praziquantel to fungal

biotransformation may yield derivatives which can become a base for novel drug development.

Methodology: Two species of *Aspergillus fumigatus* were used: ATCC MYA-4609 and ATCC 1022. Fungal mycelia were cultured in 125 mL Yeast-Mold broth medium, at 28°C with constant agitation, 180 rpm. After 48 hours, each culture was dosed with 0.05g of Praziquantel suspended in 1.25mL of acetone, a concentration of 40mg/mL, and grown for a period of 5, 10, or 15 days post inoculation. After these periods, the mycelia were filtered using a vacuum filtration apparatus and filter paper, with a 20 to 25µm particle retention, rinsed with water and discarded. The resulting broth contained metabolites which were extracted with three equal volumes of 100ml ethyl acetate. High Performance Liquid Chromatography was used to ascertain the level of metabolization of Praziquantel.

Findings: Preliminary results of this analysis demonstrate that *A. fumigatus* ATCC MYA-4609 showed peak metabolic efficiency at day 10 with major peaks at 5.6, 6.0, and 10.0 minutes. All of these major peaks are assumed to correspond with praziquantel metabolites. Conversely, *A. fumigatus* ATCC 1022 exhibited insignificant metabolic activity. The praziquantel peak remained relatively unchanged at 8.1 minutes for each time course. Future directions include refinement of the crude extracts, separation, and purification before submitting to chemical structure identification, such as Nuclear Magnetic Resonance and mass spectrometry to identify the chemical structure of the metabolites obtained

Biological Sciences

Investigating the role of traumatic brain injury in the development of Parkinson's disease

Martinez, Alex, PhD; University of the Incarnate Word

Acosta, Ashley; University of the Incarnate Word

Giuffrida, Andrea, PhD; UT Health San Antonio

Mission Driven Research

Through thoughtful innovation, this research project reflects the university mission by searching for truth on the development and progression of a disease that affects many individuals.

Project Abstract

Purpose: The purpose of this study is to investigate the role of traumatic brain injury (TBI) in the development and progression of Parkinson's disease (PD). This was done by assessing whether TBI alone can induce PD-like symptoms in healthy rats (development) and if TBI can accelerate the progression of symptoms in a rat model of PD. The results of this study can further the understanding on the development of neurodegenerative disease such as PD.

Rationale and Significance: Parkinson's disease (PD) is a progressive neurodegenerative movement disorder that results in muscle rigidity, tremors, and impaired movement initiation and coordination. The motor symptoms of PD result from the progressive and irreversible loss of dopamine neurons that project from the substantia nigra to the striatum, which are two brain areas involved in movement control. Traumatic brain injury (TBI) can cause brain tissue to stretch, tear, bruise, and swell which can induce progressive deterioration of brain physiology. It has been shown that TBI may increase the risk of developing brain disorders characterized by gradual loss of neurons such as Alzheimer's disease. It is still unclear whether TBI can trigger and/or exacerbate the neurodegenerative process underlying PD.

Methodology: In order to assess the role of TBI on PD development, male albino Wistar rats were subjected to TBI of the pre-frontal cortex with the use of a controlled

cortical impactor. After recovery, cortical damage and PD development was monitored using MRI and behavioral assessments 2, 7, 14, 30, and 60 days post-TBI.

In order to assess the role of TBI on the progression of PD symptoms, male albino Wistar rats received a sub-level injection of the dopamine selective neurotoxin 6-hydroxydopamine. Upon recovery, rats were subjected to TBI as described previously with cortical damage and PD progression monitored using MRI and behavioral assessments (cylinder and adjusting steps test) 2, 7, 14, 30, and 60 days post-TBI.

Findings: TBI in both intact and sub-level PD rats resulted in edema and white matter damage within the prefrontal cortex, which was no longer present 2 months post-TBI. Preliminary behavioral data at 2, 7 and 14 days has not shown an increase in PD-like symptoms in both intact and sub-level 6OHDA rats subjected to TBI.

Biological Sciences

Investigation of P-Glycoprotein (PGP) Induction and Paclitaxel Resistance by PGP Drug Substrates in Ovarian Cancer Cells

Penn, Ryker; University of the Incarnate Word

Smith, Helen, PhD; University of the Incarnate Word

Ford, Bridget, PhD; University of the Incarnate Word

Farrell, Christopher, PhD; Presbyterian College

Mission Driven Research

At the core of the University of the Incarnate Word's mission is a commitment to use our scientific research to benefit the community. Whether or not that community is local or the scientific community as a whole this spirit of service is essential to what it means to be a graduate student. This research presents an advancement into the analysis of the manifestation of drug resistance in tumor cells before the administration of chemotherapeutic drugs. This project is investigating a mechanism of chemotherapeutic drug resistance, such resistance could be avoided if this mechanism were better understood.

Project Abstract

Purpose: Medications that are commonly used by patients for co-morbidities may cause an induction of PGP expression in ovarian cancer cells, possibly conferring resistance to chemotherapeutics used to treat those tumors.

The first aim of this investigation is to induce the overexpression of PGP in the ovarian cancer cell line SKOV-3 using the common antihistamine Fexofenadine and the common chemotherapeutic drug Vinblastine, both of which are PGP substrates.

The second aim of this investigation is to determine if the PGP-induced SKOV-3 cells display primary drug resistance to a standard chemotherapeutic used to treat ovarian cancer, Paclitaxel.

Rationale and Significance: Ovarian Cancer affects around 204,000 women globally each year and of those it is responsible for nearly 125,000 deaths. During treatment, the tumor cells may develop resistance to the chemotherapeutic medications used, significantly decreasing efficacy of those medications and adversely impacting patient care. There are several possible mechanisms for how this drug resistance develops, the most significant of which is mediated by the efflux transporting capabilities of P-glycoprotein (PGP). PGP

expression can be modulated by some medications, especially those categorized as PGP inducers. It is possible that PGP substrates may also increase PGP expression. Such an increase in expression would confer resistance to tumor cells being treated with chemotherapeutics that are PGP substrates such as Paclitaxel.

Methodology: SKOV-3 cells were treated with the PGP substrates Fexofenadine or Vinblastine to induce PGP expression. The PrestoBlue Cell Viability Assay was used to determine non-toxic concentrations of the PGP substrates for PGP induction. PGP induction was verified using quantitative RT-PCR. PGP expression in substrate-exposed cells was compared to unexposed cells. After treatment with DMSO, Fexofenadine, or Vinblastine the induced cells were then treated with Paclitaxel to test for PGP-induced resistance to that chemotherapeutic medication. Resistance was determined using the PrestoBlue Cell Viability assay, comparing viability of Paclitaxel treated-PGP induce cells to PGP-induced cells not treated with Paclitaxel. All cell cultures were repeated in triplicate. The significance of PGP induction to controls as well as the impact of Paclitaxel resistance in PGP-induced cells compared to controls was determined using Student T test and ANOVA.

Findings: Results from the first and third induction study exhibited a trend towards PGP induction in our cells after treatment with Vinblastine. The DMSO and Fexofenadine treated cells did not show similar signs of induction. The second induction study exhibited different results with Fexofenadine treated cells having the highest levels of PGP and Vinblastine having the least. The variance present between each of the studies indicates the need for further testing. To test for the development of resistance the treated cells from the second and third studies were exposed to Paclitaxel. Results from this also showed discrepancies with a general conclusion that cells with induced PGP exhibited reduced survivability. The disparity in the results of these studies for both experiments indicates the need for further testing and exploration of PGP expression and Paclitaxel resistance in SKOV-3 cells.

Biological Sciences

Screening of NIH Clinical Collection Library for Inhibitors of Candida albicans Biofilms

Armstrong-VanLaar, McKenna R.; University of the Incarnate Word

Pierce, Christopher G., PhD; University of the Incarnate Word

Mission Driven Research

Our research on the identification and characterization of novel treatment strategies against the pathogenic fungus, *Candida albicans*, reflects the UIW Core Value of Innovation. *Candida* infections are a major cause of fungal infections worldwide and are associated with high morbidity and mortality rates, due to limited treatment options and emerging resistance to the common antifungals. Thus, repurposing FDA approved drugs, as we have done in this work, has the potential for more rapid development of antifungal treatment strategies, which are urgently needed.

Project Abstract

Purpose: *Candida* species represent a main cause of opportunistic fungal infections worldwide, and *C. albicans* is the most common etiological agent of candidiasis. These infections are typically associated with unacceptably high morbidity and mortality rates, mainly due to the limited arsenal of antifungal drugs. Furthermore, the ability of *C. albicans* to form biofilms, complex microbial communities, heightens this issue of resistance as biofilms are intrinsically less susceptible to these commonly used antimicrobials.

Rationale and Significance: Considering the role of biofilm formation in *C. albicans* infections, it represents a valuable target for the development of anti-virulence treatment strategies. One advantage of targeting such virulence factors is it may inflict weaker selective pressure for the development of resistance.

Methodology: In this study, we performed a cell-based phenotypic screen of compounds in the NIH Clinical Collections library. Briefly, the compounds were screened to identify inhibitors of *C. albicans* biofilm formation and fully mature pre-formed *C. albicans* biofilms.

Findings: Following the initial screening of the compounds, 12 compounds inhibited *C. albicans* biofilm

formation. The compounds displaying the greatest effect on *C. albicans* biofilm formation included pitavastatin calcium, hexachlorophene, and MK 886. Pitavastatin calcium, a drug used to lower LDL cholesterol, inhibits more than 90 percent of *C. albicans* biofilm formation at a concentration of 10 μ M. Currently, the effects of pitavastatin calcium on preformed biofilms, adhesion, and filamentation are being investigated. Hexachlorophene, a once routinely used disinfectant, and MK 886, a compound known to suppress platelet aggregation, both inhibit more than 75 percent of biofilm formation at 10 μ M.

Biological Sciences

Antibiofilm activity of Chloroxine and Oligomycin A against Candida albicans

Nieto, Brittany L.; University of the Incarnate Word

Pierce, Christopher G., PhD; University of the Incarnate Word

Mission Driven Research

This research reflects the UIW Core Value of Innovation. Fungal infections represent an increasing health threat to immune and medically compromised individuals. The seriousness of fungal infections is heightened due to the lack of antifungal drugs available and increased resistance to these drugs. The purpose of this project is repurpose two drugs, chloroxine and oligomycin A, in effort to address the urgent need of developing new treatment strategies targeting resistant fungal biofilms.

Project Abstract

Purpose: *Candida albicans*, while a common inhabitant of the human microbiota, represents an increasing health threat to immune and medically compromised individuals. As an opportunistic pathogen, *C. albicans* is capable of causing disease ranging from superficial to life-threatening systemic candidiasis. The seriousness of *Candida* infections is heightened due to the lack of antifungal drugs available, particularly against the biofilm mode of growth.

Rationale and Significance: *C. albicans* biofilms are clinically relevant as they are more resistant to antifungal drugs. In addition to *C. albicans* ability to develop drug resistance, the toxicity of these antifungals to human cells represents a major problem.

Methodology: The purpose of this project is repurpose two drugs, chloroxine and oligomycin A, in effort to address the urgent need of developing new treatment strategies targeting the resistant *C. albicans* biofilms. Chloroxine, a synthetic antibacterial drug, inhibits 80 percent of *C. albicans* biofilm formation at concentrations between 0.5-1.0 $\mu\text{g/ml}$. Oligomycin A, a macrolide produced by *Streptomyces* species used as an antibiotic, inhibits 80 percent of biofilm formation at 8 $\mu\text{g/ml}$. Furthermore, 8 $\mu\text{g/ml}$ concentration of oligomycin A inhibits 50 percent of fully mature pre-formed biofilms, which are generally much more resistant to treatment.

Findings: Future studies are aimed to characterize the inhibitory effects of these compounds on adhesion and filamentation, two important processes associated with the formation of *C. albicans* biofilms. Repurposing drugs, such as chloroxine and oligomycin A, has the potential for more rapid development of antifungal treatment strategies against *C. albicans* infections.

Biological Sciences

A Preliminary Analysis of Codon Bias in Turtles

Nguyen, Vivian, B.S; University of the Incarnate Word

Starkey, David, PhD; University of the Incarnate Word

Mission Driven Research

The mission of the University of the Incarnate Word is to teach students to understand their relationship to the physical world. In addition, we want to instill in our students the importance of research. This project meets both of those criteria and explores a topic that has a direct impact on how organisms survive in the natural world.

Project Abstract

Purpose: After the genetic code was deciphered it was determined that many amino acids (AA) were degenerate i.e., coded for by multiple codons. With the advent of DNA sequencing technology it became apparent that all codons were not utilized with equal frequency and there is codon bias.

Rationale and Significance: A variety of hypotheses have attempted to explain this disparity including variable rates of mutation or selection for increased translational efficiency.

A variety of studies have investigated codon bias. However many groups are still unstudied.

Methodology: Turtles were chosen for this study based on their unique physiology and life history. Three diverse turtle lineages (softshell, pond, and sea) were utilized. Initially, 3rd codon positions were examined across all lineages. This analysis suggested a preference towards codons ending in A or C ($p < 0.01$). If lineages are examined individually, only soft shells show a similar pattern. Next, the 6-fold degenerate AA, Leucine and Serine, were examined. Each AA shows a similar patterns of codon usage across groups ($p = 0.899$). If Leucine codons are analyzed separately, all lineages preferentially utilize CTA ($p < 0.01$). A similar result is observed in Serine with TCA utilized preferentially ($p < 0.01$). If all codons are examined, 3 codons (GAC, GGA, CTA) are utilized preferentially in sea turtles

($p < 0.01$). Four additional codons (ATC, ACT, CTT, ATT) are utilized preferentially in sea turtles and softshells ($p < 0.01$).

Findings: Overall, these results suggest a bias in codon usage exists in turtles. Investigations are currently underway to determine whether this bias reflects genomic rates of mutation or selection regarding translational efficiency.

Biological Sciences

Photoreception in Lumbriculus variegatus, an aquatic annelid.

Vargas, Marina; University of the Incarnate Word

Acosta, Veronica, PhD; University of the Incarnate Word

Mission Driven Research

This research will add to the body knowledge we currently understand regarding photoreception in Annelids. The UIW mission supports the research for and communication of truth, thoughtful innovation, and the care of the environment. While my project is a stepping stone for future research in photoreceptors, it places importance in how annelids can provide information that can impact our lives in the future. Meanwhile, my research has allowed for growth in my knowledge, patience, and dedication. This has allowed me to become a more well-rounded individual.

Project Abstract

Purpose: The Purpose of this research is to determine what type of chemical makeup, or opsins, make up the photoreceptors in *Lumbriculus variegatus*. Understanding what range of the spectrum affects the photoreceptors, will result in locating them on the posterior-most end of the annelid. This research will allow for a better understanding of the photoreceptors in higher order organism.

Rationale: *Lumbriculus variegatus*, an aquatic annelid worm, is capable of complete regeneration from a few body segments (Martinez et al., 2006). While our lab has focused on the cellular and molecular characterization of regeneration within the central nervous system, there is still much to be learned about the basic biology of the worm. In the Annelids, there are three different types of photoreceptors that exist: rhabdomeric, ciliary, and phagosomes sensory cells. Photoreceptors are present in cerebral ocelli, in various ectopic ocelli, and eyes situated in different places in various photoreceptor-like sense organs (Purschke et al., 2006). *Lumbriculus* is thought to possess photoreceptors within its posterior-most segments, as rapid tail withdrawals are evoked when a shadow is cast over the water column. Understanding the

photoreceptors and the opsins of *Lumbriculus variegatus* will broaden the information on *Lumbriculus* and add to the body of knowledge of the evolutionary projection of photoreceptors. Our study characterizes for the first time the Lumbriculid photoreceptor.

Methodology: Using transmission electron microscopy, we identified the type of photoreceptors found and described their arrangement. We expanded our phototaxis data to dissect which wavelengths of light caused the strongest phototactic response in these annelid worms. In addition, the transcriptomic analysis was used to try and isolate Lumbriculid opsin gene(s). This has a quantitative study: A sample group of 10 randomly chosen annelids was used for each of the five different wavelengths of light <Red, White, Blue, Green, UV>. Using the template (diagram on the right), a petri dish will be divided into 5 different segments/regions that will have a radius that is 1.4 cm greater than the previous one. The petri dish was filled with approximately 1 cm of distilled water. The light source was placed directly on top of the (x) and the light encompassed the whole first region. For each wavelength trial, one annelid was placed in the region (1) with the "Head" facing down toward the (5th) region. The light source was turned on, and the annelid's reaction to the wavelength was recorded and analyzed after all of the prospective wavelength trials were done.

Findings: We have preliminary data using a phototactic assay, that suggests that *Lumbriculus* does respond to red wavelengths of light faster than compared to white, green, blue, and UV light. The blue light was the wavelength that resulted in longer responses from the annelid. We were able to identify a type of cell that could be a photoreceptor due to the river of connectivity from the nerve cord. Although further research is needed to confirm its properties of the photoreceptor.

Biological Sciences

Activity Budget of the Asian Elephants (Elephas maximus) at San Antonio Zoo

Walker, Rachel, PhD; University of the Incarnate Word

Alsareinye, Zane; University of the Incarnate Word

Burkett, Ashley; University of the Incarnate Word

Gonzalez, Kristin; University of the Incarnate Word

Wenzel, Brandi; University of the Incarnate Word

Mission Driven Research

University of the Incarnate Word believes every student should receive a pristine education and allow students to expand their knowledge with accessibility to multiple resources. Researching and understanding the way animals behave and interact socially provides a foundation for a much larger scale of education and expansion of knowledge. Our research reflects the University's core values by expanding community knowledge on a variety of different species and contribute to the discussion of understanding non-human mammal behaviors. Only by working collaboratively can we, as a community, better apprehend topics that can be used in a global discussion. We hope that through this presentation community members will be more educated and motivated to engage in this topic in the future. Finally, from this research we can explain how human care services focus on animal welfare.

Project Abstract

Purpose: A primary objective for zoo managers is to ensure the greatest possible welfare for zoo elephants. This study examined the behavior of three Asian female elephants (*Elephas maximus*) over several months at San Antonio Zoo. During this time activity budgets and social interactions were examined. The purpose of this study was to measure the activity budgets for all three elephants. This provided information regarding the introduction of two of the elephants to this exhibit.

Rationale and Significance: Elephant behavior can change due to a variety of situations such as time of day, seasonal variation, enrichment and social groups. This data is especially useful to not only learn more about each individual elephant's personalities and preferences, but to better accommodate the exhibit

regarding animal welfare. This data can be used to explore questions such as, which type of enrichment is favored by each elephant or how much time do they spend on their own or with each other. The results of this study may provide a foundation for longitudinal comparison and aid in assessing how various aspects may influence their behavior.

Methodology: Three female Asian elephants were observed during this project at San Antonio Zoo. They ranged in age between 41-57 years old. A broad ethogram was developed to assess a series of behaviors. Behavioral categories included daily maintenance, such as feeding and locomotion, as well as social, aggressive, and stereotypic behaviors. Prior to data collection the inter-observer reliability met a 90% requirement. Behavioral data were collected using scan sampling with 1-min intervals during 10-min observation periods (resulting in 10 data points per observation period). Data were collected via direct observation during daytime hours (10:00 to 16:00). We collected a total of 1,780 data points in Fall 2016 and a total of 1,300 data points in Spring 2017. In regards to each elephant we obtained an average total of 1026.667 data points per animal over both seasons.

Findings: The elephants spent the majority of their time eating and drinking. There were some small differences in the hierarchy of the other behaviors but in general the moderate behaviors included rest, exploration, locomotion and stereotypic behavior. We are continuing analysis on the types of social interactions between the elephants and if there were changes in their behaviors based the month the observations were made. This is a continuous project to assist in keeping a longitudinal record on their behavioral patterns.

Biological Sciences

*The frequency and nature of social interactions and behaviors by a group of belugas (*Delphinapterus leucas*) in human care*

Walker, Rachel, PhD; University of the Incarnate Word

Alsareinye, Zane; University of the Incarnate Word

Martinez, Mordecai; University of the Incarnate Word

Burkett, Ashley; University of the Incarnate Word

Mission Driven Research

This research echoes the mission of UIW through a variety of core values such as educating the community of the innovation regarding new studies and ideas. This research on beluga whales helps show truth in research findings, through data and analysis. Within this type of project it provides the opportunity to understand animals more in depth. Researching and understanding the way animals behave and interact socially provides a foundation for a much larger scale of education and spread of knowledge. Research assists in allowing human connection to God's creation and providing a stronger understanding of these animals.

Project Abstract

Purpose: The purpose of this study was to increase our knowledge regarding beluga whale behavior, specifically social interactions and play. There is very little information regarding these types of behaviors. Although this study does not seek to generalize the results to wild populations, it does suggest a framework for examining and using observational research to understand more about beluga whales social interactions and play behaviors.

Rationale and Significance: Previous research has explored beluga whales in human care and examined allocare (Hill & Campbell, 2014), bubble bursts (Hill, Kahn, Brilliot, Roberts, Guterrez, & Artz, 2011), visual laterality (Yeater, Hill, Baus, Farnell, & Kuczaj, 2014), vocalizations (Vergara, Michaud, & Barrett-Lennard, 2010), social-sexual behavior (Glabicky, DuBrava, & Noonan, 2010) and behavioral development (Hill, 2009). We know very little on the aspects of beluga whale activity. Most of the research in the wild is focused on behaviors that are only viewed at the surface as well as echolocation and immunology. The current research will allow us to closely observe their behavior and interactions with other

whales. This type of project increases our ability to discover and describe many aspects of a specific type of marine mammal.

Methodology: The purpose of this current study was to document the frequency and context of social interactions and play of beluga whales in human care. Four belugas comprised the sample of the current study. There were two males and two females housed at Georgia Aquarium during the video session. The archival video data was collected in 2013 where 15 minute focal follow videos were taken between 5/1/2013 to 8/2/2013. This provided a total of 435 minutes of video. The video recorded all visible underwater behaviors of the four belugas. Operational definitions were used to assist in the description of the actions of each beluga whale. There are 44 operational definitions that were used. We collected the frequency and sequence of the behaviors for each beluga whale. Since we used the focal animal sampling technique each video was observed four times to focus on one of the belugas within the 15 minute video. Due to the sampling technique it took between 1 hour to 1 ½ hours to collect the data on all four whales. The data were sorted in excel to describe the frequency and duration for each of the observed behaviors. This also included social interactions between the whales.

Findings: Preliminary analysis has focused on the two male beluga whales. One of the males, "G", demonstrated 36 social interactions with the other beluga whales. Within those social behaviors "G" interacted the most with "Q" (39%) followed by "M" (32%) and "B" (29%). The other male, "B", demonstrated 55 social interactions with other beluga whales. Within those social behaviors "B" interacted the most with "M" (59%) followed by "G" (32%) and "Q" (9%). Additional analysis is currently being examined.

Biological Sciences

Overcoming Candida albicans Drug Resistant Biofilms with HSP90 Inhibitors

Winski, Christopher J.; University of the Incarnate Word

Alvarez, Hector; University of the Incarnate Word

Pierce, Christopher G., PhD; University of the Incarnate Word

Mission Driven Research

My research project exemplifies the University's core values of education and innovation. More specifically, through my work in Dr. Pierce's laboratory, I continue to learn and to expand my scientific knowledge in the search for a potential antimicrobial treatment which will ideally improve the health of thousands of communities.

Project Abstract

Purpose: *Candida albicans* is a common opportunistic fungal pathogen and is capable of causing life threatening infections. Two important virulence traits associated with these infections are the formation of biofilms on the surfaces of host tissues and implanted biomaterials, as well as, the ability of the organism to filament. Biofilm-associated infections are generally much harder to treat as they are more resistant to antifungal drugs and host immune defenses.

Rationale and Significance: Thus, targeting biofilms represents a viable alternative to the development of novel treatment strategies against *C. albicans* infections. The molecular chaperone, Hsp90, has been reported to play a role in *C. albicans* virulence and blocking Hsp90, genetically or by chemical inhibitors, increases *C. albicans* susceptibility to azoles and echinocandins. Hsp90 is also linked to the morphological switch in *C. albicans* from yeast to filamentous growth. This transition is associated with pathogenicity of the organism and is essential for the architecture of biofilms.

Methodology: In this study, 600 novel compounds from the Hsp90 Inhibitor Library commercially available from ChemDiv were tested to determine their anti-biofilm activity using the microtiter plate model of biofilm

formation coupled with a metabolic XTT reduction assay.

Findings: Eight compounds were identified to inhibit biofilm formation by at least 50 percent. The compound with the greatest activity, K416-0139, inhibited 97 percent of biofilm formation at a concentration of 10 µg/ml. Compounds J038-0588 and G851-0291 both inhibited biofilm formation by 63 percent at 10 µg/ml. Given Hsp90 inhibitors have been described to increase susceptibility to antifungal drugs, current experiments are aimed to characterize the combinatorial effects of K416-0139, J038-0588 and G851-0291 with fluconazole. Considering the role of Hsp90 in drug resistance and biofilm formation in *C. albicans*, targeting Hsp90 represents a valuable strategy for the treatment of drug-resistant biofilms which is urgently needed.

Business

Household Purchasing Decisions: A Log-Lin Regression Approach

Luna-Pulido, Belinda; University of the Incarnate Word

Lehenbauer, Kruti R., PhD; University of the Incarnate Word

Mission Driven Research

The University of the Incarnate Word has taught me lifelong learning skills that I can further utilize in my future endeavors. From these skills I have also been able to formulate an approach that provides an innovated insight specifically to determine consumer expenditures for producers and suppliers in the U.S based on consumer demographics and characteristics which will give them insight to better marketing to target audiences.

Project Abstract

Purpose: The different characteristics of households play an important role in the decisions made by households regarding expenditures. This study aims to identify what specific characteristics of households drive the decisions to make specific purchases such as entertainment and apparel using the Consumer Expenditure Survey Data from the Bureau of Labor Statistics for the years 2016-17.

Methodology: First, we follow the log-lin regression model methodology to identify if there are clear disparities in purchasing decisions based upon the gender of the Head of Household. Then present logistical models to test for the probability of expenditures on apparel and entertainment for a household based upon characteristics such as income of the household, age of the head of the household, family size, number of children in the household, number of earners in the household, education of the head of the household, and race and ethnicity of the head of the household as our primary independent variables.

Findings: Initial results of these models indicate that there are clear differences in total expenditures based upon the gender of the head of the household.

Moreover, there are differences in the way households allocate expenditures towards entertainment and apparel based upon the gender of the head of the household. This analysis is helpful for producers and suppliers who are pursuing marketing decisions regarding how to target specific audiences.

Business

How the Freedom of Information Act (FOIA) Provides a Competitive Advantage in Acquiring Contract Awards from the Veterans Administration

O'Reilly, Kevin E.; University of the Incarnate Word

Mission Driven Research

This poster presentation examines the primary tool used by the citizens of this country to understand and surveil the inner workings of the US Government. Studying the effectiveness of this tool reflects upon the University of the Incarnate Word's mission to educate and find truth within the community we serve.

Project Abstract

Purpose: The Freedom of Information Act (FOIA) is the law that grants citizens, companies and organizations the ability to request information from US Federal Government agencies and departments. This poster presentation will outline how FOIA requests are submitted to gain access to governmental information, what that information consists of, and the positive financial impacts requesting organizations are experiencing from their FOIA submissions.

Rational and Significance: Information is power, and in the world of high stakes competitive business, proprietary information is key to good decision making and achieving a decisive victory when competing for governmental contracts. A lucrative market and source of highly proprietary information is the US Federal Government. This information is consequently available, if granted by the holding agency, to open disclosure through FOIA.

Methodology: The Veteran's Administration Office of Privacy Information and Identity Protection provided 28,148 FOIA requests collected during fiscal-year 2013. The Office of Management and Budget provided 6,997 awarded contracts through a comprehensive open source database called USASpending.gov. The search criteriums were fiscal-year 2013, 2014, 2015, and 2016 with a commodity class of 6515 (Medical and Surgical Instruments, Equipment and Supplies), the obligation threshold was \$100,000, and the targeted agency was the Veterans Administration.

Findings: Understanding your competitors' previous actions, business behaviors and risk tolerance will give any organization an advantage during a competitive governmental solicitation process. The research shows that the more FOIA requests submitted, the increased probability of a contract award, and the higher the value of government's contract obligation will be. The data under analysis suggests that for every FOIA request submitted, an organization will enjoy roughly two additional contracts with an increased obligation value of approximately \$540,000 with a predicted confidence of nearly ($R^2 = .85$) and a ($p < .001$). Future study should place a greater emphasis on organizations that did not submit FOIA requests to the Veterans Administration to determine if there is a statistically significant difference between the groups of FOIA requestors and non-FOIA requestors.

Business

A Logical Model for Reducing Healthcare Costs Through Mathematical Selection by Distance and Quality

Vequist IV, David, PhD; University of the Incarnate Word

Harmsen, Earl, MBA; University of the Incarnate Word

Nesser, Chris, PhD ; University of the Incarnate Word

Mission Driven Research

This research will result in a model that could lead to substantial savings and higher overall outcomes for specific medial procedures. In addition, the ideas developed by this research could be utilized to create more inclusive health policies that will help the most needy patients to be able afford better providers.

Project Abstract

Purpose: Using a statistical model, the authors propose to show how to structure a population health model that improves quality and health for lives covered by a self-insured company or a third party payer (i.e. health insurance provider). This model involves using a patient consumerism (or medical tourism) methodology as its base and expands on the idea of bundled contracts and narrow networks as a cost reduction and quality enhancement strategy. If successfully implemented, this model could result in substantial savings and lead to higher overall outcomes for specific medical procedures.

Rationale and Significance: This modelling of healthcare travel can provide a rational decision making tool for healthcare policy makers when considering how to create regulatory schemes or in the development of communication tools to impact patient choices. In addition, as the model is expanded to include more data (for example, efficacy or projected medical outcomes) the analysis will reveal suggested actions to maximize the return on investment of scarce healthcare resources and lead to better outcomes for patients.

Methodology: The authors created the model by calculating the potential costs of several hundred randomly generated patients using the following formula: $\text{Costs} = \text{Surgical Cost} + \text{Travel Costs} + \text{Per Diem}$

Costs. In addition, the Surgical and Per Diem costs for each city (A, B, C) will also be adjusted as a function of several factors including: 1) Stage of Cancer (I, II, III+); 2) Patient Survival Rates of the facility (low, medium, high); and 3) weighted averages to determine the costs in each city and the travel costs (depending on the distance, either a roundtrip “drive” or “fly” option).

This dataset was analyzed by a Linear Programming Minimization analysis (6 in total) to determine the optimum cost models (I, II, III+ and Drive or Fly) for the ‘patients’.

Findings: Interestingly, it was found that relatively small changes in cost will entice exchanges (patients travelling out of region for care). For example, in the Type I – Drive Option Model, patient exchanges between cities would be encouraged if: 1) the costs increase at the origination cities by 3.5% (A), 4.3% (B), and 5.3% (C) it will encourage the exchange of patients with another city; 2) if the cost decreases at destination cities by 5.0% to 8.0% then exchanges will be encouraged; or 3) other cost models (Type II, and III+, each with drive or fly travel options) yield cost fluctuations no more than a +/- 10%.

This research has helped to elucidate the steps involved in developing an even more sophisticated models that could include recently developed population health strategies such as: 1) bundled contracts; 2) narrow networks; and even creating a “Value Model” that would include both costs and efficacy.

Business

A Study of the Economic Value of Urban Refugees in the United States

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University of the Incarnate Word

Canales, Mario; Alumni

Mission Driven Research

As peace scholars, the authors feel a moral obligation to bring attention to the ongoing refugee crisis around the globe. The primary goal of their paper is to provide visibility for urban refugees' economic potential. The authors hope that this paper will inspire other researchers to investigate other refugee pockets around the world. This research paper would represent a small contribution to filling the need and thus of serving both moral and economic progress.

Project Abstract

Purpose: The primary goal of this paper is demonstrate the 'economic potential' of urban refugees whose lives have been disrupted by absence of peace, to re-settle and prosper. What is the economic value of refugees? How to help refugees whose lives have been disrupted by absence of peace, to re-settle and prosper? The authors anticipate that the findings of their research will provide some insight for the ongoing refugee crisis across the globe.

Rationale and Significance: According to the UN, more people than ever before are currently displaced due to terrorism and conflicts. If refugees have a chance to learn and grow, then they will contribute economically to their receiving countries. It is time to acknowledge the courage and perseverance of refugees, and their contribution.

Methodology: This poster paper will demonstrate a 'Conflict / Problem Tree' in the context of urban refugees in the USA. Peace scholars frequently use 'Conflict/Problem Tree' as it visualizes the interaction between structural, manifest and dynamic factors related to a conflict situation. Within a conflict tree, while the roots symbolize structural 'static' factors, the trunk represents 'manifest issues' linking structural

factors with the dynamic factors; and the leaves represent the 'dynamic factors.'

The uniqueness of this research paper comes from our attempt to turn the well-known 'Conflict/Problem Tree' into an 'Opportunity Tree.' Our paper specifically addresses the potential economic value of urban refugees. In this paper, we acknowledge urban refugees as an 'economic asset' rather than an 'economic burden.'

The authors hope that their paper will generate discussion and interest among peace scholars. Their ultimate goal is that the findings of their research will provide some insight for the ongoing refugee crisis across the globe.

Findings: There are three conclusions that can be drawn:

Firstly, our research into the economics of refugees provides convincing evidence that often the humanitarian aspect of welcoming refugees over shadows their long-run economic impact and their role as peace catalysts. Evidence shows that net economic impact of re-settled refugees is positive.

Secondly, the long-run economic benefits can be assorted as new potential labor source for aging population, increase in household spending and increased market demand, and therefore stimulation of the local economy, refugee owned business, and potential tax revenue source.

Thirdly, refugees can also potentially play an important role in peace negotiations and post-conflict reconstruction in their countries of origin.

Communication and Information Sciences

Exploring Working Relationships Among Interns and Supervisors in Virtual Internships

Youngblood, Phillip; University of the Incarnate Word

Mission Driven Research

A work internship can open doors to employment after graduation, but students may be challenged to balance school and life commitments with the logistics associated with a traditional internship. A virtual internship enables students to intern with organizations throughout the world, and gives sponsoring organizations more latitude to include a larger and diverse selection of interns.

My research on working relationships in virtual internships revealed that participants learned to communicate and interact in innovative ways, with a wide diversity of people from different cultures and nationalities. Their experience gave participants a better perspective of their world, and appreciation for the service they could provide from the knowledge and skills they gained in school.

Project Abstract

Purpose: The purpose of my study was to explore working relationships that interns and supervisors experiences during virtual internships. My guiding question was, “How do interns and supervisors develop working relationships in a virtual environment?” Other questions concerned elements and influences of working relationships, how participants displayed relationship virtually, and differences in intern and supervisor perspectives.

Rationale and Significance: Internship success is a high stakes endeavor for students and potential employers. Learning how to establish and sustain working relationships is critical to that success. Balancing an internship at a physical location with school and life commitments can be difficult for students. Virtual internships can ameliorate some issues, and hold the promise of a world of experiences, but relating in an environment in which participants do not interact in person may be challenging.

A review of decades of literature revealed that most studies focused on the intern’s perspective, and on factors of success. Few studies explored the role of working relationships, or the supervisor’s perspective, and still fewer explored virtual internships.

This research was of professional and personal interest to me. I was slow to learn how to relate to others as I grew up, and am still learning. As a PhD student, I engaged in two traditional and one virtual internship, from which I could draw my own experiences. As a full-time faculty member, I developed and taught internship classes, so I wanted to learn what my students might be experiencing and make classes more meaningful for them.

Methodology: I needed to learn more about the virtual internship phenomenon so I could talk to others about their experiences. I found an existing, validated, survey containing structured but open-ended questions about success factors. I posted the survey on a hosted online site and invited interns and supervisors from the same virtual internship program in which I participated to respond.

Relationships involve mental constructs I could not obtain from a survey, so I applied a set of criteria to the survey data to identify intern and supervisor respondents who would most likely share rich and diverse information about their experiences with me during an interview. I also used survey data to guide which topics to explore with them.

After preparing the survey and interview data, I applied several qualitative methods granular analysis and then deduced a set of common themes about working relationships in a virtual internship.

Findings: On analysis, I found that I could group themes that most participants held in common into five categories. I turned those categories into research sub-questions and examined how they informed me of the story that each individual participant had been trying to tell me in the survey and interview data about their experience with working relationships in virtual internships. I also looked for any differences in supervisor and intern perspectives. After discerning individual stories, I created a collective story to answer my research questions.

Education

Graduate Education Students Perceptions of Campus Climate Using Photovoice

Alsandor, Danielle J.; University of the Incarnate Word

Yilmazli Trout, Inci; University of the Incarnate Word

Sieczynska, Alicja; University of the Incarnate Word

Mission Driven Research

In alignment with the university's core values of faith, education, truth, innovation, and service, this research project examines the university's campus climate in search of ways to better understand how graduate students in education perceive the culture. The research highlights how the roles of faith, Catholic social teaching, and service are reflected visually and/or structurally on the campus.

Project Abstract

Purpose: In this participatory action research project, researchers utilized the qualitative method of photovoice as a tool for graduate students in education to express their perceptions of campus climate and culture at a Catholic HSI in South Texas. The study is theoretically framed on literature about the college environment, campus climate, and campus culture with distinction on how both organizational/structural characteristics and holistic characteristics affect individuals and groups.

Methodology: Photovoice is an arts-based research method designed to generate positive change in communities by encouraging community members to articulate their point of view, on given phenomena, through photographs, narratives, and dialogue with stakeholders (Wang & Burris, 1997; Wang, 1999). The purpose is to better understand UIW's campus environment from the lens of graduate students, who tend to bring more varied personal and professional experiences and knowledge to the classroom. Through photographs with captions and narration, a reflective paper, and a final exhibit and focus group session, researchers garnered data about UIW's campus culture. The overarching research question is how do education graduate students perceive the campus environment and campus climate? Approximately 13 graduate students addressed five specific prompts with ten

pictures per prompt. The five prompts include: What does the institution mean to you? What in or about the campus environment makes you feel comfortable or supported? What do you identify as challenges affecting campus climate or culture? What places/spots/locations on campus you feel contribute to the campus climate and/or culture? What recommendations would you like to share with institutional administrators to positively influence campus environment, climate, or culture?

Findings: The findings suggest education graduate students perceive a welcoming campus climate undergoing change and working to maintain its identity and engage all students meaningfully. They offer suggestions on ways to enhance the climate and allow the culture to reflect more consistently the institutional mission and core values.

Education

Latino Male Success: The Validating Experiences that Impact Persistence and Fuel Master's Degree Completion at a Hispanic Serving Institution

Ayala, Paul, Ed.D.; University of the Incarnate Word

Mission Driven Research

The research reflected the mission and core values of the university in its design, results, and implications. The researcher sought to gain an understanding of the research problem by investigating the participants' truth. The participants provided rich descriptions of their lived experiences that shed light on how they entered and navigated their higher education journey. An analysis of these narratives gave way to an innovative model for Latino male persistence in graduate school. The results of the study could be used to better serve underrepresented Latino male students as they pursue a master's degree.

Project Abstract

Purpose: The purpose of this study was to describe and understand the validating experiences of Latino male students who are enrolled in a master's degree program at a Hispanic Serving Institution and to develop a validation model for Latino male persistence in graduate school.

Rationale and Significance: As more Hispanic Serving Institutions begin offering graduate education, the need to understand Latino/a persistence at the graduate level becomes necessary. Because most research on student persistence is conducted at the undergraduate level (Hurtado, Cuellar, & Guillermo-Wann, 2011), it is critical that researchers conduct studies at the master's level to understand if factors impacting Latino/a persistence at the undergraduate level persist into graduate school, if master's level students face similar or different persistence decisions, and if existing theories and models of persistence can be used to address the needs of Latino/a graduate students. As a result, the timeliness of this study could not be overstated because it provided an understanding of the validating experiences that impact persistence decisions for a virtually non-existent population in the literature, the Latino male seeking a master's degree.

Methodology: The study applied grounded theory, qualitative methodology and applied focus groups, individual interviews, observation, and document analysis.

Findings: The analysis of the data revealed that the persistence journey of successful Latino men in master's degree program is complex. The results of the study found that successful Latino men enter their graduate studies with similar characteristics and they encounter three types of validation inputs that fuel completion—academic, interpersonal, and Hispanic Serving Institutions Affirming Cultural Success. A significant finding of this study was the identification of a third validation input entitled Hispanic Serving Institutions Affirming Cultural Success. Collectively, the actions within each validation input had a positive impact on persistence and degree completion.

Education

The Effect of BIO Simulator Time Utilization on Clinical Interns' Performance

Kasraie, Narges, OD, FAAO, Diplomate of the ABO;
University of the Incarnate Word

Kasraie, Noah, PhD; University of the Incarnate Word

Mission Driven Research

As active members of the UIW faculty, we constantly strive to better educate our students with the most up to date available technologies and alternative teaching methods. We believe a dedication to such, helps to better prepare our interns on their journey to become great clinicians, and to serve their patients and communities. This study is an example of how we incorporate new technologies in our curriculum, and investigate its usage in order to maximize and improve the quality of their learning experience of in one of UIWRSO pre-clinical laboratories.

Project Abstract

Purpose: Dilated fundus examination is an important part of every comprehensive exam and it requires the mastery of a skill that is performed using a hand held condensing lens and a Binocular Indirect Ophthalmoscope (BIO) device. This skill is vital for diagnostic purposes and certain surgical procedures, and typically a student doctor must go through extensive training investing many hours of practice on real human patients. With the advancements of technology, Eyesi Indirect Ophthalmoscope (BIO) simulators have introduced an alternative to real patients for practice, therefore, may help interns in learning this difficult clinical skill.

Rationale and Significance: The purpose of this retrospective quantitative approach is to investigate the relationship between the amount of time interns spent utilizing BIO simulators as an additional learning tool for practicing purposes, and their BIO clinical performance grades among two different groups of second year interns at a private optometry school in Texas.

Methods: Two different groups of second year interns were statistically compared. The comparison consisted of two different groups of interns from Fall of 2016

(n=56) and Fall of 2017 (n=61). Both groups used the traditional method which involved using real practice patients, but also utilized the Eyesi Indirect Ophthalmoscopy Simulator as an additional learning tool to help them practice and improve their clinical BIO skills. Interns were given an entire semester to practice and were instructed to complete a minimum number of modules including all of the modules contained in sections A1, A3, A5, A6 and A7 of the simulator without any due regards to time or number of attempts. Their mastery of this challenging skill during a semester was assessed based on the interns grades on a BIO checkout, and a final clinical proficiency. Each groups' grades were evaluated to investigate whether there is a relationship between the amount of time simulators were utilized by each intern, and the interns' clinical performance grades.

Findings: The study showed that there was no statistical significant correlation between the amount of simulator utilization time, and interns' clinical performance grades on the BIO checkout and the final clinical proficiency grades in both groups.

Further research needs to be done in order to investigate the possibility to maximize the benefits of BIO simulators as a supplementary teaching tool. While accuracy and proficiency are critical aspects of the BIO training process, however, efficiency is also another important factor that needs to be taken into account. Perhaps with time optimization, the learning experience can be modified to have the simulators not only help improve skill accuracy, but also improve BIO efficiency, therefore, enabling educators to better prepare interns for real life patient encounters.

Education

Strategic Planning and Objectives in Higher Education: A case study of the University of Incarnate Word

Sanchez, Ray; University of the Incarnate Word

Mission Driven Research

The operating principle of innovation guided this research. The research was intended to look at strategic planning and strategic objectives from a different perspective or a new way of learning.

Project Abstract

Purpose: The purpose of this qualitative case study is to understand strategic objective cohesion with the mission, vision, and core values in the Strategic Plan Vision 2020 at The University of Incarnate Word in San Antonio, Texas. The central question guiding the study was what is the strategic objective cohesion in Vision 20/20 at the University of Incarnate Word?

Rationale and Significance: This study has implications for business and higher education institutions when developing or checking the cohesion of strategic elements against strategic planning objectives. The process developed in this study is an innovative approach that can be operationalized for compliance with institutional mission, vision and core values.

Methodology: The methodology of this study was a qualitative case study. The study utilized elemental coding method, qualitative descriptive coding, to look for emergent patterns, categories, themes concepts, and assertions. The decision to use descriptive coding was based on the type of instruments or documents that were being analyzed. The resulting ten themes (mission, vision and core values) were turned into ten data points that were coded into SPSS software and check for cohesion using the thirty strategic objectives from the UIW strategic plan Vision 2020. Qualitative data was triangulated with quantitative data. The decision to use this type of triangulation was to strengthen the evaluation and make the findings more useful by providing different perspectives about the information described. The data showed that 36.7 percent of the strategic objectives were aligned with

the mission, vision, and core values. However, 63.3 percent of the objectives were based on other criteria.

Findings: Based on observations and experience the institutional strategic objectives can be attributed to operational and managerial objectives. The strategic objectives can be confused with components of management specifically performance measures, targets, goals, and strategic initiatives. Consequently, this could lead to missed opportunities and mistracking of outcomes. One final note, the mission statement declares "who we are?" The vision statement declares "who we inspire to be?" The core values are the institution's principles, beliefs or philosophical values that shape the culture, support the vision and reflect the institutional values. The strategic elements (mission, vision, and core values) are at the core of strategic planning. The strategic objectives are the actionable part of the strategic plan. The stronger the cohesiveness between the strategic elements and the strategic objectives leads to a stronger position for the institution to compete in the market.

Education

Video-Enhanced Instructional Delivery: A Quality Improvement Project in Physical Therapy Education

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Dover, Samantha; University of the Incarnate Word

Nowland, Janie; University of the Incarnate Word

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Petersen, Evan J., PT, DSc, OCS, FAAOMPT; University of the Incarnate Word

Mission Driven Research

Educational excellence is part of the mission of UIW and Innovation is one of its Core Values. Our research directly supported these aims as we studied the instructional delivery of one of the main courses in the Doctor of Physical Therapy curriculum. The results of this study concluded with the development and implementation of video-enhanced instructional delivery methods for first year physical therapy students.

Project Abstract

Purpose: The purpose of this study was to identify gaps within the instructional delivery of first year physical therapy education with a focus placed on manual therapy and exercise skills. The study followed the quality improvement model of “Plan, Do, Study, Act”.

Rationale and Significance: Instructional delivery is an instructor’s approach to teaching the content of a course which helps students learn and retain knowledge and skills. Instructors should not only take into account best practices, but also understand the different learning styles and preferences of the students they teach. Research has shown that a multimodal approach can enhance the classroom experience by improving interaction between teachers and learners as well as learners and input material.

Methodology: A prospective, longitudinal, observational study was conducted over the course of two years within the Doctor of Physical Therapy Patient Client Management (PCM) I course. Physical therapy students who had completed their first year of

education were asked to complete a Likert-type subjective survey. In the survey, they were asked to indicate areas of the PCM curriculum they found to be the most challenging, as well as potential learning resources they may benefit from in the future. Student responses were collected anonymously and analyzed as a group. One of the areas identified as most challenging was selected to study and additional instructional delivery methods were developed and implemented the following year to address those challenges. A follow-up survey was administered a year later to assess the results of the instructional delivery changes.

Findings: The initial survey received an 87% response rate (46/53 students). Results indicated that "Manual Therapy and Exercise" was a part of the curriculum students found most challenging to master and that additional learning resources would be beneficial. When asked what additional learning resources they would like to have, 75% (40/53) of students indicated that a video clip of each intervention with voice-over narration would be the most beneficial. Therefore, videos of each manual therapy and exercise intervention for the lower quarter (lumbar spine, hip, knee, and ankle; 84 total interventions) were created with voice-over narration. These were then embedded into the current delivery method of a slide deck with printed instructions, instructor demonstrations, and hands-on practice. The follow-up survey presented at the end of the first semester the next year received a response rate of 88% (46/52 students). Students found the video-enhanced instructional delivery method to be either “Very Useful” (41%) or “Extremely Useful” (46%) to their learning and retention of manual therapy and exercise skills. The results of this study indicate that the addition of the video-enhanced delivery system significantly benefitted 87% of the students during their first semester of physical therapy school. Results of this study support the creation of similar enhanced videos for the upper quarter and continued use of a multimodal teaching approach.

Engineering

Project Zephyrus: A Study of Real-time Ozone Monitoring System

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Whittemore, Alison, PhD; University of the Incarnate Word

Caglayan, Okan, PhD; University of the Incarnate Word

Mission Driven Research

Air pollution is a serious health concern in the San Antonio area. Local agencies, businesses and individuals must work together to meet national air quality standards and to protect our community and the environment. The Department of Engineering at the University of the Incarnate Word is inspired to support our local community and CPS Energy by providing research experiences to the students in real world problems. We are committed to strive for a continuous partnership in helping the San Antonio community through education, truth, faith, service and innovation.

Project Abstract

Purpose: The main objective of this research was to develop a low-cost, mobile, micro-scale ozone monitoring system that can be deployed at remote locations on a large scale.

Rationale and Significance: Ozone pollution has become a growing concern throughout the City of San Antonio as its long-term environmental, economic and health impacts are better understood. In Earth's upper atmosphere, ozone plays a vital role by providing a shield from the sun's ultraviolet rays. However, ozone at ground level (often termed "bad" ozone) is a harmful air pollutant. Ground level ozone is formed when oxygen chemically bonds with various carbon-based emissions, such as nitric oxides (NOx) and volatile organic compounds (VOC). Ozone pollution is most concentrated in high population areas such as urban and suburban regions. Rural areas are also affected as emissions are carried to them by the prevailing winds. In order to understand precisely the source and flow of air pollutants, several professional air quality monitoring stations are deployed at strategic locations across the country. However, such stations are extremely large, expensive, and are usually operated by national, state, or local environmental protection

agencies making them impractical for large scale deployment.

Methodology: The proposed framework consisted of an Arduino prototyping platform that allowed for modular hardware development. Ozone was measured by using a Screen-Printed ElectroChemical (SPEC) sensor. In addition to SPEC sensor, there were additional sensors integrated into the platform measuring wind speed with direction, humidity, pressure and temperature. Real-time ozone data transmission, storage, visualization and analysis were accomplished by using MATLAB software and its cloud service ThingSpeak via a network interface card (NIC).

Findings: The field test results were compared to those of the Texas Commission on Environmental Quality (TCEQ) – the state's environmental agency that provides air quality information to the public. The preliminary data, obtained at the corner of Broadway and Hildebrand, showed promising results with average 8.35% difference compared to TCEQ readings for the duration of two days. We planned on testing the proposed unit in the field by extending the time and changing the location to the UIW Solar House as a future work.

Engineering

AVS Lab and CPS Energy sUAV Program

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Epps, Phillip Jordan; University of the Incarnate Word

Campbell, Darnell R. ; University of the Incarnate Word

Han, Zhifeng; University of the Incarnate Word

Frye, Michael, PhD; University of the Incarnate Word

Mission Driven Research

This research allows the UIW students and staff an opportunity to further educate themselves in an innovative and growing field that will one day alter the way energy and utility companies go about their routine inspections, PR media events, and other daily tasks.

Project Abstract

Purpose: In this study, we present the advantage of using sUAV for monitoring and inspections of power lines in addition to developing technical, operational, and procedural training requirements and best practices for sUAVs in power line inspections, creating a UAS (unmanned aerial systems) system architecture and concept to operation model, and cultivating an airspace mapping suite that overlays with GIS (geographic information system) systems.

Rationale and Significance: UAV (unmanned aerial vehicle) platforms are estimated to reach a total market size of 100 billion dollars before the year 2020 according to Goldman Sachs [1]. This growth has fueled research and development of technology capable of increasing the number of potential applications and accomplishable tasks per deployment. CPS Energy is one of numerous utility companies, along with Duke Energy out of North Carolina, to be approved for drone inspecting of transmission lines and other isolated energy infrastructure.

Methodology: We began by being certified and trained on Draganfly platforms X4-C, X4-P, and X4-ES; then obtained training from Drone Launch Academy for obtaining Remote Pilot licenses (in accordance to FAA Part-107). In the Spring of 2018, we began training outdoors around de-energized power lines at specialized facilities using the Draganfly platforms, along with a DJI Mavic 2 Zoom platform, and expect to work around energized power lines by the Fall of 2019.

Findings: We plan to use collected data from the payload to program the sUAV to perform autonomous power line inspections, which has begun beta testing, and show the advantage of the incorporation of this tool into future projects.

Environmental Science

Fog Type Climatology for South Central Texas

Davila, Janice; University of the Incarnate Word

Mission Driven Research

Community service at the University of the Incarnate Word will be a key element in this presentation. Since the mission mentions care of the environment and community service, one can say that both elements were used based on the climatological analysis provided. The Presentation will also fall under one of the main core values of education; to enlighten the citizens. Not only will the vast amount of information help others grasp the patterns of fog for various locations in San Antonio, in can in return help people open their horizons and ask questions on the subject; which is part of a teaching process.

Project Abstract

Purpose: This presentation will describe the results of an analysis for south central fog types; based on the classification scheme of Byers, 1959 over a ten-year time span. On average San Antonio gets 139 days of fog a year (as representative of south-central Texas weather).

Rationale and Significance: Fog is an important factor in aviation, traffic accidents and visibility. State wide vehicle collisions were reported for vehicles in 2017 totaling 2,915 due to fog, according to Texas Department of Transportation (http://ftp.dot.state.tx.us/pub/txdot-info/trf/crash_statistics/2017/24.pdf). This study aims to classify the fog types in south central Texas as a means to aid in fog forecasting and therefore, increase driver awareness and road safety.

Methodology: Daily weather maps were gathered from The National Center for Environmental Prediction, (www.wpc.ncep.noaa.gov) to classify the fog types. In doing so, gain situational awareness is gained of the climatology each the day of occurrence. This methodology was used for each day that fog was reported from the year 2008 to 2018.

Findings: The analysis showed occurrences of fog over a ten-year period on the following locations in south-central Texas; Kelly AFB, San Antonio, Randolph AFB and Stinson Municipal. The presentation will summarize the time and date of when fog occurred along the

assigned meteorological classification. Conceptual models of the fog types most frequently occurring in south central Texas will also be displayed.

Environmental Science

Bird Diversity In Urban San Antonio: A Look Into the Benefits of Native Plant Landscaping

Martinez, Carli; University of the Incarnate Word

Mission Driven Research

In my research I strived to use innovative mechanisms to discover the answers behind my speculations. As this wonderful University encourages us to do, I challenged myself to make my work immersive so that I could apply and enhance my education where my passion lies- ecosystem studies. Through my findings I look forward to serving the scientific and global community in the great fight against environmental degradation. I know that with faith and perseverance, great things can be accomplished.

Project Abstract

Purpose: Although Texas currently holds the second highest bird richness in the United States, urbanization of its major cities threatens levels of bird diversity. The city of San Antonio has grown rapidly within the past 40 years, resulting in the loss of natural habitat. A major concern for bird diversity involves the lack of native vegetation within San Antonio's urban landscaping, which naturally supports many forest edge and interior bird species. As of recent however, urban locations have begun incorporating Texas natives into their design.

Rationale and Significance: This study looks into the benefits of native plants on bird diversity in these areas, hypothesizing that greater native plant diversity correlates with greater bird diversity. Research of this sort is important in the field of environmental sciences because findings may be used to push urban design towards mechanisms that encourage reasonable cohabitation with native wildlife, allowing cities to experience higher levels of ecological soundness.

Methodology: The hypothesis was tested by performing transect surveys over three different urban locations (Settings A, B, and C), each with differing levels of native plant abundance and distribution. Setting A was expected to have the lowest bird diversity and Setting C the highest. The surveys were used to document the abundances of each plant and bird species identified within the settings. After the counts, the Shannon

Diversity Index was used to calculate levels of plant and bird diversity for each setting.

Findings: As expected, Setting C had the highest level of plant and bird diversity. However, Setting A, which had the lowest plant diversity, experienced a higher bird diversity than Setting B. This was speculated to be related to other environmental factors, in that Setting A may have had elements of attraction that outweighed the lack of native vegetation. Further research of these elements should occur to determine whether these factors are more significant than native plants in influencing bird diversity.

Fine and Performing Arts

"I love you" Personal-creative to response to a the study of the music in the Arab world.

Barron Esper, Mariana; University of the Incarnate Word

Mission Driven Research

The core values of the university "innovation" and "education" were particularly significant for the creation of this product. Through the course material in "Studies in World Music" and the independent research I took part on in order to understand the musical system of region, I was able to create an original musical art form that would honor the richness of the a region in the Arab world. Faith, truth, and service were detrimental in the personal relationship I had with this project through the love and selfless story of my grandparents which inspired this idea on the first place.

Artist Statement

Purpose: This original piece "I love you" is a creative response to a contract course (independent study) I conducted in "Studies in World Music". In this, my goal was to expand my knowledge and appreciation of the rich music culture from the Arab world and more specifically the Levant countries (Lebanon, Jordan, Palestine, Egypt, and Syria).

Rationale and Significance: Moreover, the material culture, the music and context, instrumentation, form, and other important characteristics that take detrimental place in the composition of a song. My family from my mother's side is of Syrian descent (after my grandparents got married, they immigrated to Mexico to start their life as a new family). Therefore, I have been exposed to different styles of Arab music from the levant region of the Middle East. Music is a major component of the dynamic in my mother's side and therefore, I wanted to dive into this region's different genres to gain a greater sense of appreciation for my personal and historical background and what better way than through my greatest passion of music!

Methodology: I narrowed my focus to an Arab musical theory concept of "maqams" to build a composition. I acquired resources such as family cassettes to understands and analyze these musical ideas to create a new one that would honor my family's heritage in a creative way.

Findings: In this composition, I created a poem dedicated to my grandparents' beautiful relationship (68 years of marriage and still going strong!) and loved ones that I have encountered and will encounter in my life As I finish my studies in International Affairs and music, I hope to compliment my passion of world cultures and music by showcasing the beauty and connection of our enriched world through art.

Fine and Performing Arts

Gender non-binary narratives in contemporary percussion

Bulls, Brandon; University of the Incarnate Word

Mission Driven Research

This work delves into the complexities of the developing conversation of representation of identity of gender non-binary individuals, exploring therein the diversity and spirituality of our community.

Project Abstract

In the mid twentieth century, percussion music—often with non-standardized instrumentation and a wide range of non-traditional and world instruments—became an important genre for non-heteronormative composers, and hence for non-heteronormative narratives. Composers such as John Cage, Lou Harrison, and Henry Cowell explored an individualistic sonic palette informed by modern dance, Asian/Pacific-rim culture, and queer experiences. Scott Harrison’s *Masculinities and Music* outlines ways in which musicians have expressed their non-heteronormative relationships with their own sexuality and gender identity. The growing popularity of pop music—especially rock and metal from the 80’s through the present—contributed to the characterization of drum-kit percussion as an aggressive, heavy, and forceful presence, inseparable from heteronormative masculinity. While in concert music of the same period, the exploration of unique combinations of timbral phenomena progressed along a separate, yet parallel path. As sexuality and gender identity have made their way into the forefront of social issues, intense examination and questioning of established gender roles has increased exponentially through scholars like Bruce Flemming. In this paper, I consider the work of San Antonio performer Claire Rousay, a transgender woman composer/performer, in the context of the broader history of percussion music in the late twentieth and twenty-first centuries. Inspired by feminist and queer theory writers, Rousay has made this examination of masculinity an element of continuity in her pieces, exploring the “other” that everything not under the umbrella of masculinity falls under. As the complex narratives of non-binary individuals have begun to be explored through music, contemporary percussion music has emerged as an especially

conducive platform. I’ll be discussing how Rousay’s music is reflective of her perceptions of masculinity, and how her techniques and style are indicative of a larger trend of non-binary musicians using percussion to articulate the burgeoning and rapidly developing public perception of their personal identity. Using interviews collected from Rousay herself and other non-binary musicians, integration of queer (specifically non-binary & transgender) theory, and musical analysis I’ll explore the relationship that contemporary percussion and gender indeture operate within; moreover, how these elements inform and influence one another in an increasingly directly correlative manner.

Fine and Performing Arts

Pianism and Critical Reception in Amy Beach's Piano Concerto in C-sharp Minor and Piano Quintet in F-sharp Minor

Lockerbie, Rachel; University of the Incarnate Word

Mission Driven Research

This research promotes the value of education in the arts for all people, regardless of gender or nationality.

Project Abstract

Purpose: Amy Marcy Cheney Beach (1867-1944) is often heralded as the first successful American woman composer of large-scale art music and was celebrated for her pianistic ability. This paper is an examination of the critical reception of Beach's work as both a performer and composer, focusing on the Piano Concerto in C-sharp Minor (1899), a four-movement work for piano and orchestra, and the Piano Quintet in F-sharp Minor (1907), a three-movement work for piano, two violins, viola, and cello.

Rationale and Significance: Comparing the large-scale concerto with the chamber work reveals that Beach's Piano Quintet in F-sharp Minor presents a unique set of problems in looking at pianism in terms of performance and orchestration, especially within the sphere of the female composer.

Methodology: Scholars who write on Beach and her music have focused on the critical perception of women composers generally (MacDonald 2003), the role of gender and genre in Beach's career success (Blunsom 1999), and her ability to create compositions that do not overtly engage issues of gender and nationality (Mardinly 2014). In this paper I assess ambiguities found in contemporaneous critical reviews of Amy Beach's work, particularly criticisms that focus on performance and perceived gaps in Beach's musical education.

Findings: Although criticized for the orchestration of her Piano Concerto in C-sharp Minor, Beach received extensive training in orchestration from the time she was fifteen. For comparison, many composers in late 19th- and early 20th-century Europe such as Anton Webern did not receive formal composition training until reaching the university level. American composer

Charles Ives (1874-1954) did not receive formal training aside from the counterpoint lessons given to him by his father. In this area, therefore, Amy Beach received more extensive training for a more prolonged period of time than many of her male counterparts, raising questions about the nature of her contemporary critics' evaluation. The concerto itself, while enjoyed by audiences, was dismissed by seven of the eight critics whose reviews appeared upon the concerto's premiere in 1900. When Beach resumed her career as a performing pianist after the death of her husband in 1910, she began performing again, and it was met by more favorable reviews. In assessing these rapid shifts in critical appraisal, this paper contextualizes Amy Beach's work in terms of the rapid changing evaluation of women as composers and in society more general

Health and Medical Sciences

Impact of Scleral Contact Lens wear on the pressure in the eyes

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Miller, Bill, OD, PhD; University of the Incarnate Word

Amir, Farshid, OD; University of the Incarnate Word

Mission Driven Research

This work reflects education and innovation. The notion that scleral contacts may elevate the pressure in the eye is coming back into the limelight. This research will help eye care practitioners in prescribing scleral contacts and educating their patients. It will also help scleral lens manufacturers in the design of their lenses

Project Abstract

Purpose: Since Scleral Lenses (SL) rest entirely on the sclera and may affect underlying anatomical structures that may influence aqueous humor flow, it is important to determine the effect of SL wear on intra-ocular pressure (IOP).

Methodology: Nine subjects with normal corneas were recruited for an Institutional Review Board-approved study. Best fit SL from a 15.8 mm diameter 0.4mm thick diagnostic-lens set was fitted on a randomly selected eye, with a silicone-hydrogel soft lens (soft lens) on the other eye. Three IOP measurements were taken with rebound iCare tonometer prior to lens application (baseline data measured at about 9:30AM), and immediately after lens removal (final data measured at about 5:30PM). Baseline and final lens vault was determined with anterior segment Zeiss optical coherence tomography (OCT). Mean baseline and final IOP for each eye was analyzed with a Student-t-test, 2-way repeated ANOVA, and the Bland-Altman plot.

Findings: IOP was elevated with SL wear for all subjects. Soft lens eyes showed a slight elevation for some but decreased in others. Mean IOP change was 5.81 ± 1.62 mm Hg for SL and -0.62 ± 0.88 mm Hg for soft lens eyes. When mean IOP in SL eyes was compared to soft lens

eyes, unpaired t-test showed a significant difference ($p < 0.05$) between the means. Bland-Altman bias was 6.43 (SD of bias 3.139). Repeated ANOVA also showed a significant difference between baseline and final IOP. The results indicate that SL wear can elevate IOP. Eye care practitioners (ECP) must consider this possible outcome in treating patients wearing SL. Additional studies are needed to determine the clinical implications of SL wear on IOP.

Health and Medical Sciences

A Dual-Task Condition Is Influenced by The Time of Day and Is Best Performed at Noon.

Pesquera, Mason, SPT; University of the Incarnate Word

Kim, Andrew, SPT; University of the Incarnate Word

Nickerson, Corey, SPT; University of the Incarnate Word

Dedick, Joey, SPT; University of the Incarnate Word;

Brown, Nathan; PT, DPT, GCS; University of the Incarnate Word

Sandoval, Robert; PT, PhD; South Texas Veterans Health Care System

Mission Driven Research

Millions of patients receive physical therapy services every year and nearly all of them learn novel tasks during their treatment. This research aims at discovering the best time during a person's sleep/wake cycle that they are able to process multiple tasks at once. If this information can be disseminated, it will help physical therapists and other health care practitioners to time their education such that patients have the best chance of proper learning and retention, thereby reducing future risk of injury. This reflects UIW's mission of seeking and communicating truth to better the public.

Project Abstract

Purpose: The purpose is to investigate whether performance of a dual-task (DT) paradigm varies based on the time of day that it is performed; and whether there is a significant interference between the motor and cognitive aspect of DT that is associated to the time of the day that said task is performed.

Rationale and Significance: Dual-task is defined as the concurrent performance of two tasks that can be performed independently, measured separately, and have distinct goals. Cognitive-motor interference refers to the phenomenon in which simultaneous performance of a cognitive and a motor task interferes with the performance of one or both tasks. Daily variations in performance of singular cognitive or motor tasks are reported in the literature. To date, the optimal schedule of a dual-task involving both a cognitive and

motor component, or the interference that is observed between these tasks, is yet to be reported.

Methods: Participants were assessed during both Single Task (ST) and DT conditions. The tasks were a 10 Meter Walk Test (10MWT) for motor performance and a Stroop Test for cognitive performance. The DT activity combined both STs. All participants performed three trials for all three conditions at three different times of the day (morning, noon, afternoon), with separate testing days for each of the times of the day tested. Participants also completed the Pittsburgh Sleep Quality Index (PSQI) prior to their first day of testing.

Findings: Noon is the best time to perform a dual task condition. Noon consistently exhibited the least motor or cognitive interference. Conversely, the maximum boost in cognitive performance was observed in the mornings.

Health and Medical Sciences

Rhythmic Training Increases Self-Selected Gait Speed in Healthy, Young Individuals: A Pilot Study

Gabriel, Avalos, SPT; University of the Incarnate Word

Jobin, Samuel, SPT; University of the Incarnate Word

Binh, Nguyen, SPT; University of the Incarnate Word

John, Ly, SPT; University of the Incarnate Word

Nathaniel, Brown, PT, DPT, GCS; University of the Incarnate Word

Smith, Scott, PhD; University of the Incarnate Word

Mission Driven Research

We hope to reflect the mission of the University of the Incarnate Word by seeking and sharing truth related to our research. We hope to eventually show that rhythmic training may be a way of increasing ambulatory speed in those who are walking slowly after injury. This is a pilot study done on young, healthy individuals as a precursor to studying those who have been injured and are at risk for falls due to slow walking speed.

Project Abstract

Purpose: The purpose of this study is to measure the effects of rhythmic training on gait speed in healthy young adults. Our hypothesis is that a short bout of rhythmic training will significantly increase self-selected gait speed in participants.

Rationale and Significance: Falling has severe potential negative consequences for adults. Risk factors for falls include lower extremity weakness, impaired proprioception, balance impairments, and slow gait speed. There have been numerous studies done on interventions designed to decrease fall risk, one of which is rhythmic training. Rhythmic training involves using an external auditory cue to train a person to walk at a specific speed, usually faster. There have been several studies showing that rhythmic training can increase the gait speed in older individuals with neurological impairments, but none on healthy, young adults. Potential reasons for slower gait speed in young adults are pain, fear of pain, or habitual change in gait speed after injury.

Methodology: The authors used a repeated measure, within subject design. Participants were chosen based on a sample of convenience consisting people that frequented the University of the Incarnate Word. Additional data from the participants was collected including age and gender. Initially, self-selected baseline gait speed measures were recorded using the 2-minute walk test. Then the participants walked for 5 minutes while trying to match their cadence to a metronome beat that was calculated by adding 25% to the patient's preferred gait speed. Finally, the patient's self-selected gait speed was once again measured using the 2-minute walk test.

Findings: The average of 61 participants had a significant increase in gait speed after rhythmic training going from 2.42 m/s to 2.64 m/s. ($t=7.838$, $p<.0001$). There was no significant difference between how males and females responded to the rhythmic training. Finally, the participants that had the largest positive change in gait speed after rhythmic training also had significantly slower baseline gait speeds relative to the participants who had little to no change in their gait speed after rhythmic training.

Health and Medical Sciences

Body Mass Index Comparisons in Bexar County Youth

Cowan, Gloimai Ari'elle; University of the Incarnate Word

Mangla, Anil T.; University of the Incarnate Word

Mission Driven Research

This research brings to light health disparities that exist within San Antonio and demonstrates the necessity to evaluate social determinants of health that contribute to the totality of holistic wellness in mind, body, and spirit in targeted populations. Identifying modifiable limitations that regionally stratify these populations supports UIWSOM's mission of community responsive care to optimize positive outcomes for individuals and the community as a whole. The vision of this research to bring awareness, education, and intervention in public health measures is guided by UIWSOM's core values of integrity, stewardship, respect, social accountability, compassion, and transformation.

Project Abstract

Purpose: The purpose of this study was to report regional BMI trends in Bexar county youth by school district, and evaluate these trends comparatively with gender and district demographic characteristics.

Rationale and significance: The increased prevalence of obesity in the adult and pediatric population over the last thirty years has driven the shift of medical interventions and public health campaigns towards a focus on preventative measures beyond the healthcare environment and into educational and policy-level frameworks. While the prevalence of overweight and obese individuals has plateaued in recent years could be attributed to this structural change in society, it is not only important to assess what factors have effectively contributed to the stabilization of prevalence but to evaluate the variables that limit the decline in prevalence.

Methodology: Data aggregated from the Texas Education Agency's (TEA) Physical Fitness Assessment Initiative (PFAI) for the 2015-2016 year was analyzed comparatively among North East Independent School District (NEISD), San Antonio Independent School District (SAISD), and Southside Independent School District (SSISD). Statistical analysis demonstrated similar outcomes and characteristics among BMI trends and demographic

profiles for both SAISD and SSISD, but notable regional differences in these variables when compared to NEISD.

Findings: The regional divergence of BMI trends occurred between the normal and overweight BMI categories in NEISD as compared to both SAISD and SSISD. Demographic variables further segregate NEISD from SAISD and SSISD when comparing socioeconomic disadvantage and race/ethnicity populations by district. This evident difference in the population of students categorized as socioeconomically disadvantaged in SAISD and SSISD was roughly twice the population than that of NEISD, and the Hispanic population in NEISD was roughly a third less than the population accounted for in SAISD and SSISD. Lastly, gender BMI trends were similar to the overall regional BMI trends and showed little difference comparatively between both genders. It should be noted, however that the prevalence of females with a normal BMI were consistently higher than males among all districts, and that the prevalence of obese males was higher than females in both SAISD and SSISD, but relatively similar in NEISD. Despite many regional differences, the prevalence of youth obesity remained relatively consistent among all three school districts with an average prevalence of 28.8% in Bexar county, compared to the national average of 18.5%. The results and conclusions generated in this study provide insight into regional discrepancies of health in Bexar county youth and serve to identify populations influenced by independent variables relative to disease burden. Outcomes evaluated provide a preliminary point to expand future studies and strategize outreach campaigns within the community. Derived associations of medical disparity in the community can be evaluated alongside the differences in social determinants of health and district level policies. Identifying regional discrepancies reveals limitations in social structures, which can then enact positive change and interventions tailored towards the needs of targeted pediatric populations.

Health and Medical Sciences

Ketonitriles as Intermediates for the Synthesis of Antiparasitic Drugs

Dallmann, Alexandria; University of the Incarnate Word

Narayan, Lauren; University of the Incarnate Word

Carvalho, Paulo, PhD; University of the Incarnate Word

Mission Driven Research

The goal of our research is to incorporate our education, truth, faith, service, and innovation in order to develop a drug that will one day treat parasitic diseases. We use our education, truth, faith, and service to lead us in our research, and we brief others on our innovation through poster presentations just like UIW Research Days.

Project Abstract

Purpose: Synthesize an effective drug to counteract parasitic diseases such as leishmaniasis, malaria and schistosomiasis.

Rationale and Significance: Diaminopyrimidines have been widely studied as drugs against parasitic diseases like malaria, and less notably against leishmaniasis. Increased resistance, decreased efficacy, and severe side effects have been observed in the current treatment regimen for these diseases, highlighting the need for new drugs against those diseases.

Methodology: Four esters reacted with four different nitrile compounds in strongly basic conditions to create sixteen β -ketonitrile compounds, which were purified through flash chromatography.

Findings: Two of the sixteen compounds have been characterized through proton and carbon NMR analysis. The other fourteen are in the process of being purified.

Once purified and fully characterized, the compounds will be cyclized with guanidine to form diaminopyrimidines which will be submitted to antiparasitic testing.

Health and Medical Sciences

Reduction of Liver Transplant 30-Day Readmission through Nurse-Led Educational Interventions

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Chargualaf, Katie; PhD, RN, CMSRN; University of the Incarnate Word

Friesenhahn, Clare: BSN, RN, Clinical Nurse; Transplant Unit, Methodist Specialty & Transplant Hospital

Gonzalez, Marcela; BSN, RN, Clinical Nurse, Transplant Unit, Methodist Specialty & Transplant Hospital

Gordon, Amy; MSN, RN, Quality Coordinator, Liver Transplants; Methodist Specialty & Transplant Hospital

Mendoza, Anna; BSN, RN, CCRN, Clinical Nurse, ICU, Methodist Specialty & Transplant Hospital

Pomerleau, Theresa; MSN, RN, CNL, Assistant Nurse Manager; ICU, Methodist Specialty & Transplant Hospital

Mission Driven Research

Aligning with the UIW Mission of Christian service, this project aspired to extend scholarship to provide nursing knowledge and skills and improve patient outcomes in the community served by the University. The project addressed the care and outcomes of a diverse population not currently addressed in the literature. Publication of the findings will benefit nurses and patients internationally.

Project Abstract

Purpose: The purpose of this study is to determine whether 30-day readmission post liver transplant for adults 18 years of age and older in a predominately Hispanic Southern U.S. population are reduced by using a new method of delivering patient education compared to the current education intervention.

Rationale and Significance: A study by Dols, Purcell, Collins, Gonzalez, Gordon, Mendoza, Pomerleau, & Chargualaf (pending publication, 2019) found that liver transplant patients in a southern transplant hospital are more likely to be readmitted if the patient had a body mass index greater than 20, were aged 18-34 or 50-65+, or had a Model for End-Stage Liver Disease Score (MELD Score) indicating the severity of chronic liver disease between 21 and 40. These patients were most likely readmitted for elevated liver function tests, fever, or diarrhea, nausea, vomiting and dehydration. Patients who

were readmitted in the first 30 days following liver transplantation were individuals whose transplantation was a result of cirrhosis related to alcohol intake. Most frequently documented coexisting conditions for the 12 patients with 30-day readmissions were cirrhosis, hepatic encephalopathy, alcohol intake, and psychiatric illnesses. The majority of 30-day readmissions occur in the first 5 days. The majority of patients readmitted had a high school or lower educational level. Literature on reading level demonstrates that the less complex educational materials in language level, layout, and amount may increase the absorption of information (Polster, 2015). It is also essential to repeat information in a variety of methods (Polster, 2015).

Methodology: This correlational study with retrospective data collection was designed to analyze the impact on 30-day readmissions using a new education intervention. The new intervention included a readiness for discharge checklist of activities/goals and an abbreviated educational handout written at a 2nd grade level. Available in English or Spanish, the new intervention also included the use of repetition through multimodal methods. Following IRB approval, whenever a patient received a single organ liver transplant and was admitted to the transplant unit, the clinical nurses posted the discharge readiness algorithm and used the abbreviated education sheet to teach the patient multiple times throughout each hospital day; reinforcing medication information with each medication administration and addressing signs/symptoms of infection/rejection, emergency contacts for healthcare needs, home care, post-hospital follow-up, and precautions.

Findings: Following the implementation of the new educational materials on January 1, 2018, readmissions decreased dramatically from 39.22% in 2017 to 28.95% in 2018. Patients who had undergone liver transplants absorbed the information in the new format readily and demonstrated readiness for discharge.

References

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Health and Medical Sciences

Decreased Amplitude of the Photopic Negative Response (PhNR) in the Ins2Akita Mouse Model of Type 1 Diabetes Mellitus

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Mission Driven Research

Diabetes, a world-wide epidemic, is the leading cause of blindness in adults, mostly due to the development of diabetic retinopathy. This study aims to find testing tools for early detection of diabetic retinopathy to minimize vision loss. In our Mission words, by using this innovative technology, we aim to provide a service to the community for the common good.

Project Abstract

Purpose: The purpose of this study is to detect early ocular dysfunction such as retinal ganglion cell (RGC) dysfunction in diabetic retinopathy by measuring PhNR amplitudes.

We hypothesized that PhNR amplitudes are reduced in a type 1 diabetic mouse model, the Ins2Akita mouse, which develops hyperglycemia by 5 weeks of age and visual function and ocular blood flow deficits early in the disease progression, before overtly visible vascular damage.

Rationale and Significance: Diabetic retinopathy (DR) is a common, severe complication of diabetes mellitus. Current clinical detection of DR is based primarily on visible retinal vascular damage, and earlier detection of impending DR might allow earlier treatment to protect function. Recent studies in both animal models and humans with diabetes have shown that degradation of retinal ganglion cell (RGC) function occurs at an early stage, before visible vascular complications and before significant RGC loss. The photopic negative response (PhNR), obtained from full-field electroretinogram (ERG) with photopic stimuli is thought to arise directly

from RGC activity and will be used to assess RGC functionality.

Methodology: Diabetic (male heterozygotes) and control (male WT littermates) mice were grouped according to age: young, adult, and old (5-6, 9-11, and 12-14 months of age, respectively). ERG recording was performed with 1.62 log cd/m² white flashes over a constant 40 cd.s/m² green background (Diagnosys Espion and ColorDome ganzfeld system) using gold ring contact lens electrodes (LKC Technologies) under isoflurane anesthesia. Following 1 hour adaptation to the green background illumination, PhNR, a-wave, and b-wave amplitudes and implicit times were measured in response to 25 10-msec flashes.

Findings: The mean PhNR amplitude of the adult diabetic mice was 36% of their age-matched controls ($p < 0.01$). For the old diabetic group, the mean PhNR amplitude was 49 % of their age-matched controls ($p < 0.05$). However, no significant difference was found in the young group. A-wave amplitudes were decreased in the diabetic adult group, to a value only 41% of their age-matched controls ($p < 0.05$). B-wave amplitudes were decreased in the diabetic old group, to 35% of their age-matched controls ($p < 0.05$). However, no significant difference was found among groups for PhNR, a-wave, or b-wave implicit times. Our results suggest that PhNR amplitude is altered relatively early in the Ins2Akita mouse model of diabetes. This suggests PhNR measurements could be used to detect diabetic retinopathy at earlier stages than the current clinical standard.

Health and Medical Sciences

HPLC Analysis of Commercially Available CBD Products in the San Antonio Area

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Rafael, Gonzales; University of the Incarnate Word

Carvalho, Paulo; University of the Incarnate Word

Ramsinghani, Sushma; University of the Incarnate Word

Mission Driven Research

This research reflects the mission of the university by communicating TRUTH, a core value of the university mission. Commercially available CBD products were tested for accuracy in label against data recovered through analysis. The study aims to seek and communicate the truth through this data for consumer awareness.

Project Abstract

Purpose: Cannabis is one of the most widespread illicit drugs of abuse in the world. With the turn of the century, cannabis has gained a huge increase in interest-recreationally and medically. Cannabis has many clinical applications such as in epilepsy, arthritis, Crohn's disease, depression, anxiety, glaucoma and Tourette's, just to name a few. In addition to its clinical uses, cannabis has widely been used recreationally with little concern to its potentially harmful risks. With lack of oversight on quality control, there is the potential of varying ingredients in varying amounts being present in the products. The overall goal of this proposal is to analyze cannabis products that are currently in the market for public use in the San Antonio area.

Rationale and Significance: The two main constituents in Cannabis Sativa (commonly known as hemp) are cannabidiol (CBD, 2-[(1R,6R)-3-methyl-6-prop-1-en-2-ylcyclohex-2-en-1-yl]-5-pentylbenzene-1,3-diol) and (-)-trans- Δ^9 -tetrahydrocannabinol (THC). While CBD is considered generally safe, THC has undesirable effects such as anxiety, psychotic symptoms etc. The commercial CBD products could contain THC along with many other cannabis ingredients. The qualitative and quantitative analysis of these products will provide information about the quality of the products.

Methodology: Commercial cannabis products available in the San Antonio area were tested by reversed-phase HPLC (C18 Waters[®] column). The samples were analyzed with a gradient of 20% buffer A (0.1% TFA in water) and acetonitrile to 100% acetonitrile over 11 min. A 1 mg/ml THC cannabinoids mixture in methanol containing 1 mg/ml each of THC, CBD, and CBN (cannabinol) obtained from Sigma Aldrich was used as the reference standard.

Findings: Qualitative analysis of the commercial products showed variation in the ingredients that often did not match the product label. At least four products were found to contain some THC when the label specifically stated NO THC. The cannabis industry produces multiple compounds for medical use. It is imperative that the major biochemical constituents of cannabis are accurately quantified, and the results made accessible to consumers. This study shows how different commercially available CBD products vary in their constituents and concentration compared to their product label.

Health and Medical Sciences

Assessing Hip Surgery Outcomes in the State of Texas: Are Outcomes Equal Across Race and Ethnicity?

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Giang, Ryan; University of the Incarnate Word

Saigal, Ammar, MD, MPH; Weill Cornell Medicine

Morrey, Matthew, MD; Christus Health

Fajardo, Roberto, PhD; University of the Incarnate Word

Mission Driven Research

This study investigate surgical outcome health disparities in Texas as a function of sex, ethnicity, and diabetic status. Orthopedic hip surgeries are relatively common and successful procedures but complications types/rates are not equal across the population. This work is an example of justice-based medical research, a primary tenet of the University of the Incarnate Word School of Osteopathic Medicine.

Project Abstract

Purpose: The goal of this study was to investigate hip fracture repair outcome inequalities between Hispanic patients and non-Hispanic White patients in the state of Texas, controlling for age, sex, and diabetic status.

Rationale and Significance: Independent assessments indicate that type 2 diabetic patients and Hispanic patients experience more post-operative complications after orthopedic hip surgery compared to non-diabetics and non-Hispanic Whites, respectively. Hispanics also have almost twice the incidence of type 2 diabetes compared to non-Hispanic Whites. Little is known about the interaction of these two factors on potential inequalities in hip surgery outcomes. Given this limited understanding, we undertook a retrospective review to better understand epidemiological trends in outcomes for hip surgery patients.

Methodology: We performed a retrospective study of potential hip fracture repair outcome inequalities between Hispanics and non-Hispanic Whites, controlling for age, sex, and diabetic status. State of Texas Hospital discharge data from 2009 were used to track fracture repair procedures (ICD-9 codes) and in-hospital adverse events. Complications were placed in one of three categories: minor, major, and mortality. Chi-squared and Fisher's

Exact tests were used to test for differences between groups. 2.94 million patient records were available in the 2009 data; 20,528 were categorized as having either a partial hip replacement or a total hip replacement. 15,052 patients were above 60 yrs of age. Approximately 60% of the patients were female and 28% identified as Hispanic.

Findings: In general, patients in Texas experienced similar outcomes in the hospital-based post-operative period, but some ethnicity-associated outcome inequalities were observed. First, among patients 18 and older and 60 and older, males experienced more major complications than females, but relatively few differences as a function of sex, ethnicity or race were observed. Secondly, as expected, the proportion of minor and major complications were greater in diabetic subjects when compared to non-diabetic subjects within a group (e.g. males or Hispanics), but diabetes did not lead to greater mortality after hip surgery. Third, diabetic postoperative complications were unequal between ethnic groups in Texas. Regardless of age, diabetic Hispanics had a higher rate of major and minor complications than non-Hispanic whites. Moreover, post-operative mortality was much greater in diabetic Hispanic patients compared to non-Hispanic White diabetic patients. This was the only difference between population subsets in which mortality differences were identified. Our results paint a complex picture of postoperative outcomes following hip surgery with respect to ethnicity and diabetic status. In general, the prevalence of postoperative complications is similar across sex and demographic groups in Texas; however, diabetic Hispanics experience more complications and mortality than diabetic non-Hispanic White patients. The reasons for this are unclear and require further investigation.

Health and Medical Sciences

Heel Injury & Pathology in an Emerging NCAA Division I Athletic Program

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Mission Driven Research

This project reflects the University of the Incarnate Word (UIW) core value of truth in seeking to present information that will communicate the accurate reporting of injury data and inform future best practice. Additionally, this project seeks to reflect the mission of the university through inter-professional collaboration.

Project Abstract

Purpose: To describe heel injury and pathology by sport and gender over a 4-year reporting period at an emerging NCAA Division I athletics program.

Rationale and Significance: Heel pathology is common in the athletic population.^{1,2,3} Heel injury and overuse are commonly treated conditions in NCAA athletics, however, occurrences vary.^{1,4,5} Most current literature focuses on treatment of heel pain in the general population; further investigation is warranted to guide research on prevention and best treatment practice of heel pain in NCAA athletics.⁶⁻¹⁰ The University of the Incarnate Word (UIW) began transitioning to an NCAA Division I program in 2016. UIW offered a total of 19 sports in 2014-2015 and expanded to 21 sports in 2015 with the addition of fencing in 2015-2016. UIW averages a roster of 520 total student-athletes/year. UIW has not historically reported injury data to the NCAA. Systematic tracking and effective reporting of injury data will become necessary for NCAA regulatory compliance and inform evidence-based practice decisions and research. No known specific studies of lower leg or heel pathology have been described for this organization.

Methodology: A retrospective epidemiological study of heel injury and pathology was conducted using injury

reports from NCAA Division I athletes at UIW from academic years 2014-2018. The data was collected from electronic medical record injury reports and de-identified by athletic training staff. Inclusion and exclusion criteria were utilized to refine the data sample. The following injury diagnoses were included in the final sample: plantar fasciitis, achilles tendonitis/rupture, retrocalcaneal bursitis, calcaneal stress fracture, and heel contusion. All sports offered at UIW during the reporting period injury were included in the sample, with the exception of co-ed cheerleading and dance.

Findings: There were 2415 total reported and treated injuries or medical conditions affecting athletic participation at UIW between 2014-2018. Of these injuries and conditions, 611 injuries (25.3%) impacted the foot, ankle, and lower leg region in a total of 355 athletes. 49 distinct injuries specific to the plantar or retrocalcaneal regions were reported between 2014-2018. 6 heel injury/pathologies were reported in 2014, 12 in 2015, 10 in 2016, 14 in 2017, and 7 in 2018. 46.9% of the heel injury/pathology sample affected male athletes with 53.1% affecting female athletes. 32.7% of heel injuries/pathologies affected athletes participating in track; 4.1% in soccer; 10.2% in cross country; 28.6% in basketball; 4.1% in volleyball; 18.4% in football, and 2.0% affected athletes participating in tennis. 12.2% of athletes sustained multiple heel injuries/pathologies within the 4-year reporting period.

Foot, ankle, and lower leg injuries make up a quarter of all injuries reported with specific heel pathology comprising 2% of all injuries. Future research will focus on calculating cross-sectional (single-year) incidence ratios for heel injury and pathology. Additional analysis will include assessment of relationships between and prediction of heel injury/pathology in UIW athletes based on gender, number of lower leg injuries, and sport type.

Health and Medical Sciences

Heated Eye Pad tested for in-office treatment of Meibomian gland dysfunction

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Mission Driven Research

This research addresses the UIW tenet of Innovation. The results of this study demonstrate that a simple treatment with a heated device provides significant symptomatic improvement to patients suffering from Meibomian Gland Dysfunction associated dry eye.

Project Abstract

Purpose: Meibomian gland dysfunction (MGD) is the most common cause of evaporative dry eye. Though manual warm compresses are the backbone of managing MGD, poor compliance makes an office-based procedure desirable. Digital Heat Inc developed a powered Heated Eye Pad (HEP) designed to warm the Meibomian sebum. The HEP resembles a spectacle frame and delivers 40oC heat to the external eyelids. This study examined efficacy of the HEP for in-office MGD treatment.

Rationale and Significance: An in-office treatment for MGD will provide betterment of patient's signs and symptoms.

Methodology: Twenty MGD subjects (18 females, 2 males) (average age 28.96 yrs) underwent clinical measures (OSDI, MGD Efron scale, Blepharitis Efron scale, NITBUT, Meibography grade (Pult grading scheme) for each eyelid and InflammDry MMP-9 expression at baseline and 4 weeks post-baseline visit.

The HEP treatment was performed for 10 minutes at the baseline visit and for 10 minutes 2 weeks post baseline. Data was analyzed by Student t-test with post hoc test for significance.

Findings: All subjects reported instant comfort (in office) past the two treatment sessions. Baseline measures were: OSDI 28.96 +/- 16.13; MGD Efron Grade 2.6 +/- 0.58; Blepharitis Efron Grade 2.07 +/- 0.58; NITBUT 7.68 +/- 3.48 seconds; Meibography UL 1.36 +/- 0.9 and LL 1.34 +/- 0.78. Ten subjects were MMP-9 positive at baseline. One month post-baseline, the measures were: OSDI 23.63 +/- 18.12, MGD Grade 1.78 +/- 0.71 (p=0.001 improved), Blepharitis Grade 1.6 +/- 0.48 (p=0.004 improved); NITBUT 7.32 +/- 3.58 secs; Meibography UL 1.44 +/- 1.04 and LL 1.41 +/- 0.84. Only six subjects were MMP-9 positive at the 4-week visit.

The instantaneous in-office comfort provided by the HEP was most likely a transient feeling of wellness since the OSDI scores did not improve significantly at the 4-week visit. A significant improvement in the appearance of the lid margins (Efron grading) was noted.

Interestingly, 40% of the patients who were MMP-9 positive at baseline did not have this inflammatory marker at the 4-week visit. While, the HEP provides some betterment, the results suggest that two in-office HEP treatments may be inadequate to deliver long-term benefits for MGD patients. The device should be considered for a more frequent, home-based use, in order to extract greater benefits for MGD patients.

Health and Medical Sciences

Increased Meibomian gland dropout and MMP-9 expression in an untreated millennial population who did not self-report for MGD treatment

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Mission Driven Research

This research reflects the UIW core value of innovation. The study demonstrates evidence that a healthy, asymptomatic, millennial population can have undetected loss of oil-producing glands in the eyelids. Detecting the early onset loss of these oil-producing glands will help prevent future detrimental effects from a chronic form of dry eye disease.

Project Abstract

Purpose: Meibomian gland dysfunction (MGD), the leading cause of evaporative dry eye is commonly under diagnosed. We examined a millennial population who were asymptomatic and did not self-report for MGD treatment, to study signs of evolving MG problems using meibography and MMP-9 testing.

Rationale and Significance: Detecting the loss of Meibomian glands at an earlier age can help limit the consequences suffered by the patient.

Methodology: Thirty-seven subjects (average age 24.61 yrs; 18 female and 19 males) consented to participate in this study. The subjects did not have any known past therapeutic management for MGD. The following measurements were taken: OSDI scores, NITBUT, Schirmer-I test, Phenol red thread test (PRT), MMP-9 expression using the InflammDry test and meibography of the upper and lower lid (UL, LL) using the Pult grading scheme. Investigators were blind to OSDI scores prior to obtaining clinical measures. Descriptive statistical measures were calculated.

Findings: The mean OSDI score was 12.89+/- 5.21 with 14 subjects scoring over 12. The NITBUT averaged 8.97+/- 3.09 with 19 subjects having a NITBUT lower than 10 seconds. Schirmer-I score was 17.4 mm+/- 9.33 with 8 subjects less than 10mm wetting. Phenol red thread had a mean of 22.41+/- 6.58 with no subjects < 10 mm. Twenty one subjects showed positive MMP-9 expression. The mean UL meibography score was 1.72 +/- 1.00, while the LL was 2+/- 1.10. Only 3 subjects had no gland dropout in any eyelid. Our results show that 38% of subjects have mild dry eye based on the OSDI, while 51% had reduced tear break-up time. Tear production was decreased in 21% of the subjects. Most strikingly, a large number (57%) of our subjects had positive MMP-9 expression (over 40 ng/mL) in the tear fluid, while a greater percentage (92%) showed measurable Meibomian gland loss. A lack of self-reporting for MGD or dry eye in this millennial population did not correlate with a healthy ocular surface. The results of our study strongly suggest a need for routine evaluation of ocular surface inflammatory markers as well as Meibomian gland status in young, healthy patient populations. It is conceivable that these subjects would become symptomatic in the future and could benefit now from interventional therapeutic management of their asymptomatic MGD. Thus, it is prudent to examine and identify "at-risk" millennial MGD patients before the ocular surface worsens.

Health and Medical Sciences

Tale of Two Cities

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Mission Driven Research

"Tale of Two Cities" is a review of the major social determinants of health that determine lifespan within San Antonio, which highlights the ten-year discrepancy in longevity as you cross from South San Antonio to north of Hildebrand Avenue. Echoing the social accountability, respect, and transformation of perspective in the Incarnate Word mission, the authors seek to draw attention and mobilize action to the disparities found in education, health outcomes, and average family income.

Project Abstract

Purpose: Social determinants have been a relatively recent but intensively researched area of health. It is widely accepted that medical care alone cannot sustain a population's health standard. Efforts put forth by entities such as the World Health Organization and Center for Disease Control has marked social determinants of health as a measurable influence. This paper seeks to review the definition and influence of social determinants of health (SDOH). San Antonio will be used as a case study demonstrating the influence that education, income, and number of local physicians have on life expectancy.

Rationale and Significance: This project is conducted in a widening field dedicated to SDOHs and increasing understanding that resources must be placed in prevention and policy as much as medicine and maintenance in order to achieve greater health outcomes. "Tale of Two Cities" reinforces these concepts by highlighting local health disparities and emphasizing the role of social determinants by using the seventh largest city in the United States as a case study.

Methodology: The data utilized in this paper was collected from the Texas Education Agency, 2018 San Antonio Adopted Operating and Capital Budget, the Center for Disease Control and Healthypeople.gov, as well as San Antonio Metropolitan Health District. Specific aims such as life expectancy, math-reading SAT scores, and average household income was gleaned from these sources by zip code. The values were selected from the ends of the spectrum, stressing the disparity between each SDOH and how they influenced life expectancy.

Findings: As a social determinant of health, the number of practicing physicians in a zip code, the average math-reading SAT score, and the average household income all had a direct correlation on the average life expectancy in San Antonio resulting in a discrepancy of at least five years. The 2018 San Antonio Adopted Operating and Capital Budget outlines millions of dollars to be utilized in improving SDOHs. The argument of this paper is that the budget is minimal and cannot adequately address each social determinant and to establish measures to truly quantify how SDOH are affected by the investments made by the local government.

Health and Medical Sciences

A Community in Need of a Healing Hand: An Assessment of the Need for Osteopathic Manipulative Medicine in San Antonio, Texas

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Mission Driven Research

Improving the health of Bexar County, with a specific emphasis on southern San Antonio (District 3), is a key focus of the University of the Incarnate Word School of Osteopathic Medicine's (UIWSOM) mission. Improving healthcare delivery is imperative to improving the quality of life and health outcomes of the surrounding community. Understanding this fact, an assessment of the current factors affecting overall health and the potential impact of Osteopathic Manipulative Medicine (OMM), was performed. This review outlines the overall health of District 3 within Bexar County, focusing on common health conditions and behaviors, and the potential to improve outcomes through the utilization of OMM. Creation of a student run free OMM clinic would provide a successful outlet to support the principles of social justice and accountability with parallel student education opportunities.

Project Abstract

Purpose: To determine the need for a free student-run osteopathic manipulative medicine (OMM) clinic to address health care disparities in District 3, within Bexar County.

Rationale and Significance: There exists a large negative health disparity among the residents of Bexar County, within San Antonio, Texas. In order to improve the health of the community, a complete understanding of the status of the residents is critical to identifying areas that have the greatest need. There is a long-standing culture in osteopathic medicine to practice in medically underserved areas. In 2017 the University of the Incarnate Word School

of Osteopathic Medicine (UIWSOM) was formally opened, presenting an opportunity to establish student led osteopathic care within San Antonio, Texas. The location of UIWSOM within District 3 prompted further investigation into the health and social inequalities of the residents within the surrounding area.

Methodology: Data was aggregated from 2011-2016 utilizing the US Census Bureau, Center for Disease Control (CDC), publicly available deidentified data sets, and systematic reviews. A quantitative analysis was performed between Texas, Bexar County, and District 3 to identify social and economic inequalities along with health conditions that can be treated with OMM.

Findings: Texas and Bexar County had similar rates of individuals diagnosed with diabetes and asthma. However, the prevalence of diabetes doubled in District 3 at a rate of 68 per 1000 individuals. The prevalence of asthma in District 3 also doubled with 14 per 1000 individuals. Musculoskeletal pain disorders effect over 50% of adults nationally. These conditions were identified as treatable with OMM. District 3 reported the highest disease prevalence, uninsured individuals (76 per 1000 people), and highest number of residents living below the poverty line (90 per 1000 people).

This review justifies the establishment of a free student-run OMM clinic in District 3, within Bexar County. The identified conditions can be treated with OMM. District 3 serves as a suitable location based on disease burden, financial need and proximity to UIWSOM.

Health and Medical Sciences

Social connection may predict physical activity for individuals with Parkinson's disease.

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Mission Driven Research

Guided by the history of the sisters of Charity of the Incarnate Word, we are trying to reach out to San Antonio to help those in need of our particular set of skills. By determining what factors can help individuals with Parkinson's Disease obtain a better quality of life, we can help create interventions to facilitate these factors. By doing this we can practice social justice, community service and care for the underserved and vulnerable populations of San Antonio.

Project Abstract

Purpose: The purpose of this study was to determine the prevalence of social engagement through both physical activities and/or social technology in individuals with Parkinson's disease, and ascertain if there is any correlation between social engagement and physical activity levels for individuals with Parkinson's disease in San Antonio.

Rationale and Significance: Parkinson's Disease (PD) is a neurodegenerative disorder that causes significant motor and non-motor disability that may decrease the quality of life. The disease affects approximately one million Americans. The disease manifests in diminished mobility capacity and can potentially lead to falls. Non-motor symptoms may also significantly impact an individual's quality of life. The combination of signs and symptoms mentioned above may limit the individual's ability to perform self-care, activities of daily living, and participation in community events. Evidence supports that physical activity and exercise provide functional benefits to those with Parkinson's Disease by improving their strength, balance, gait speed, quality of life and non-motor

symptoms. However, despite the substantial benefits of physical activity and exercise, many patients are not currently physically active or exercising.

Methodology: A pilot survey was created based on published physical activity and social engagement questionnaires. A pilot survey was administered at a local PD education symposium to refine the questions. The revised questionnaire was distributed to 400+ participants of two local PD organizations in San Antonio. Respondent data was analyzed using non-parametric analysis to determine relationships between social engagement of individuals with PD and their physical activity habits and beliefs. A Mann-Whitney test was conducted to determine the association between physical activity frequency and individual or partnered exercise. A Spearman Rho correlation was conducted to determine if there was a relationship between the number of days spent performing exercise or participating in physical activity in a week and the frequency of connecting with friends and family over the phone or computer.

Findings: There were 63 persons (Mean = 70.5 yo, 42% female) with PD that responded to this survey. Each Hoehn and Yahr stage was represented; Stage 1 –24%, 2-19%, 3-43%, 4-10%, 5-3%. There was not a significant difference in total days of physical activity between the groups that exercised with a friend or alone ($U(n=56)=311.00, p=0.20$). There was a positive (but weak) relationship ($r_s(n=56)=-.29, p=.034$) between the number of days exercised in a week and the frequency of connecting with friends and family over the phone or computer.

Review of the responses suggests that individuals with PD do utilize technology to connect with other individuals and desire to utilize these connections to increase their adherence to physical activity or exercise. Therefore, strategies to increase social engagement through technology may be beneficial in increasing physical activity and thus the overall functional capacity and quality of life. Based off these results further research is warranted to determine the efficacy of social engagement tools to increase physical activity adherence for individuals with PD in San Antonio.

Health and Medical Sciences

A descriptive study of the social determinants of health affecting physical therapy utilization for individuals with Parkinson's Disease in San Antonio.

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Mission Driven Research

Guided by the history of the sisters of Charity of the Incarnate Word, we are trying to reach out to San Antonio to help those in need of our particular set of skills. By determining what factors affect access to physical therapy in patients with Parkinson's Disease, we can practice social justice, community service and care for the those in need.

Project Abstract

Purpose: This study aimed to identify the social determinants of health affecting the utilization of physical therapy services for individuals with Parkinson's disease in San Antonio, Texas.

Rationale and Significance: In the United States there are approximately 1 million individuals diagnosed with Parkinson's disease (PD). Current evidence has established that physical therapy can have a very positive effect on reducing symptoms, improving functional capacity, safety and improving the quality of life for individuals with PD. Unfortunately, there are many studies which have demonstrated that several factors including race, gender, income, insurance, geography, stage of disease and literacy contribute to disparities in health care utilization with patients with chronic health conditions. There is insufficient evidence to identify factors affecting access to physical therapy (PT) services by individuals with PD. Therefore, a pilot survey was developed to explore determinants of health associated with PT access in San Antonio.

Methodology: A pilot survey was created based on published determinants of PT utilization in chronic disease.

A pilot survey was administered at a local PD education symposium to refine the questions. The revised questionnaire was distributed to 400+ participants of two local PD organizations in San Antonio. Respondent data was analyzed using non-parametric descriptive and comparative statistics.

Findings: There were 63 persons (Mean = 70.5 yo, 42% female) with PD that responded to this survey. Each Hoehn and Yahr stage was represented; Stage 1 –24%, 2-19%, 3-43%, 4-10%, 5-3%. The majority (65.08%) of respondents indicated having received physical therapy for their condition, and 68.25% were managing their symptoms pharmacologically. A history of engaging in physical therapy was associated with having healthcare insurance ($\chi^2(n=63)=23.89, p<.001$). Ability to access PT services was not significantly associated with income, gender, or disease stage.

Therefore, individuals with health insurance (65%) were more likely to participate in physical therapy (88%). Individuals without insurance (35%) were less likely to engage in physical therapy (22%). This difference in physical therapy utilization represents significant potential disparity in physical therapy access for both insured and uninsured individuals with Parkinson's disease in San Antonio. This disparity is magnified when the absence of healthcare insurance is considered.

This investigation revealed a utilization of physical therapy services rate for the individuals with PD involved in this sample of individuals in San Antonio to be much higher than previously supported in the literature (>68% in this sample population versus <14% in national samples, even with the presence of Medicare). This wide variation in physical therapy utilization is an atypical finding versus more extensive studies and this sample and may indicate the positive effect of social support systems that promote physical activity and exercise and may not represent the larger population of individuals with PD in San Antonio.

Based off these results further research is warranted. The respondent's locality did not proportionately represent the southern regions of San Antonio. A larger and more representative sample may reduce selection bias.

Health and Medical Sciences

Modeling Improvement in Contrast Sensitivity after Dark vs. Milk Chocolate

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Patrizi, Korey, BS; University of the Incarnate Word

Mission Driven Research

We showed that dark chocolate enhances detection of low contrast targets. We extend this research to additional stimuli and model the improvement in contrast sensitivity function. We hope that our ongoing efforts will identify benefits of dark chocolate in patients with disease.

Project Abstract

Purpose: To quantify the positive effect of dark chocolate in flavanol-rich cacao beans on low contrast visual detection.

Rationale and Significance: Dark chocolate in flavanol-rich cacao beans improves blood flow, cardiovascular function and alleviates symptoms of degenerative disease. We reported a slight improvement in contrast sensitivity (CS) and visual

acuity (VA) after acute consumption of dark chocolate (DC) vs. milk chocolate (MC; doi:10.1001/jamaophthalmol.2018.0978). Our purpose was to extend this effort to include an additional measure of CS and low contrast VA and model the overall improvement in CS after DC.

Methodology: A randomized, masked crossover design was used to assess VA and CS after acute consumption of a DC bar (47 g; cacao, 34 g; total flavanols, 316.3 mg) vs. a MC bar (40 g; milk chocolate cocoa, 12.4 g; total flavanols, 40 mg, 8X less flavanols than DC bar). 30 healthy adults (mean age 26±5) participated in DC and MC study arms in two separate sessions separated by at least 72 hours. Subjects were unaware of the chocolate type consumed 2 hrs. before testing with order (MC vs DC) randomized. Subjects were tested binocularly with best correction on large letter CS (Pelli-Robson chart, 1m, 20/670 letters), small letter (CS, 20/25) and high contrast VA at 4m (Super Vision Test, Precision Vision, Inc.) and near CS (20/260 letters) and low contrast (6%)

VA (response driven staircase, MS Surface, 91 cm; Innova Systems, Inc.). ANOVA and post-hoc t-tests were used to assess VA and CS. Data from all five measures were converted to Michelson contrast and spatial frequency (assuming 2.5 cycles per letter) to determine best-fit CS functions.

Findings: Two-way repeated measures ANOVA across chocolate (DC vs. MC) and test type showed a significant increase in VA and CS with DC vs. MC ($F=5.9$, $p<0.02$). Most significant effects were obtained for small letter CS (DC mean 1.45 logCS, MC 1.30, $p < 0.001$) and 20/260 CS (DC 1.95 logCS, MC 1.88, $p < 0.003$) with smaller improvements for high contrast VA (DC mean -0.22 logMAR, MC -0.18, $p < 0.03$) and large letter CS (DC mean 2.06 logCS, MC 2.0, $p < 0.04$) with a trend toward better low contrast VA after DC (DC 0.17 logMAR, MC 0.19, $p = 0.08$). Expressing all data as CS and spatial frequency, both DC and MC data were best-fit by exponential functions ($r = 0.98$) with identical shapes and negative exponents allowing for comparison and prediction of values across DC and MC domains. We reached a ceiling effect for VA limited by cone spacing but observed greater improvement in CS likely limited by cortical processing. These findings provide further evidence for an improvement in CS following acute consumption of DC vs. MC. It is possible that increased blood flow to the retina, visual pathway or cortex may underlie this enhancement. Further research is needed to better ascertain the clinical significance and duration of these effects. Elderly patients and those with ocular disease may benefit more from increased blood flow from DC. Our future research will target these populations.

Health and Medical Sciences

Distinguishing between Genuine and Non-Genuine Visual Loss: The 1 and 2 Meter Visual Field

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Mission Driven Research

This research provides an innovative approach for distinguishing between genuine and non-genuine visual loss based on a new visual field test. It should be used widely to enhance diagnosis.

Project Abstract

Purpose: The purpose of this study was to evaluate the efficacy of 1m and 2m whiteboard visual fields to differentiate between pathological and psychogenic visual loss.

Rationale and Significance: The visual field (extent of vision to the side) is measured with a computer-based field test calibrated for a short (33cm) distance. However, some subjects have reported decreased vision, such as loss of visual acuity or field for without evidence of optical or pathological etiologies. The patient may be “malingering” to avoid work or has a psychogenic basis and is convinced vision is impaired. This is not uncommon requiring careful scrutiny and passionate clinical management. Formerly 2m tangent screens (felt boards to measure field size) were common, allowing for measurement at 1 and 2m. A normal patient shows a field about 2X larger at 2m such that the angular field is the same as at 1m, while a patient with a psychogenic issue may report the same size at each distance “tubular fields.” Unfortunately, 2m tangent screens are rarely available. We used a large whiteboard to conduct 1 and 2m fields on normal adults to establish evaluate this approach for clinical application.

Methodology: Visual fields were measured with a 3m whiteboard 1m and 2m from each subject with

counterbalanced test order. The subject viewed a black "X" at eye level with their preferred eye. A white metal wand with a 3mm black circular target at 1m and 6mm target at 2m were used to determine the horizontal size of the blind spot and size of the visual field (when target disappeared). A yellow marker was used to measure endpoints not visible to subjects. 26 visually normal young adults (27 ± 3 years, 17 females, 9 males) were tested after signing informed consent documents in accord with our IRB approved protocol.

Findings: Two-way repeated measures ANOVA across distance and parameters measured showed a significant effect of distance ($F = 26.2$, $p < 0.001$) and significant interaction ($F = 35.9$, $p < 0.001$). Post-hoc two-tailed paired t-tests revealed that the significant interaction term reflected opposite effects of test distance on blind spot size and horizontal field size. Specifically, the mean blind spot was 6% larger at 2m (5.9 deg.) vs. 1m (5.4 deg., $p < 0.04$). Conversely, the horizontal field was 13% larger at 1m (mean 47.2 deg.) vs. 2m (41.0 deg., $p < 0.001$). The larger field at 1m is likely due to the small physical size of the targets used and that some subjects' fields exceeded the extent of the whiteboard. We can, however conclude that, with this technique, a field size at 2m which is $41.0/47.2 = 87\%$ of the size at 1m can be considered normal linear expansion and evidence against a psychogenic basis for field loss. In future studies we may modify target size and/or distance to better accommodate the test procedure. This presentation will conclude with a de-identified case showing no change in physical size at 1 and 2m coupled with objective evidence of psychogenic visual loss.

Health and Medical Sciences

Dark Chocolate Enhances Multi-focal Electroretinograms Compared to White Chocolate

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Mission Driven Research

To determine if dark chocolate can enhance performance in visually normal individuals and, if so, has potential to have a greater positive effect on patients with eye disease and in the elderly.

Project Abstract

Purpose: Our purpose was to compare effects of a dark chocolate (DC) bar to a white chocolate (WC) bar (no flavanol content) on multi-focal electroretinograms (mfERGs) which assess retinal function from multiple sites.

Rationale and Significance: Flavanols in DC increase blood flow and decrease oxidative damage to the CNS. DC from flavanol-rich cacao beans improves cardiovascular function, reduces symptoms in Alzheimer and Parkinson disease, and improves vision.

Methodology: 26 visually normal adult subjects (mean age \pm SD = 27 years \pm 3, 17 females, 9 males) participated in a randomized, double-blind crossover study to assess mfERG amplitude and latency after consumption of a DC or a WC bar comparable in all ingredients except for flavanol content (total flavanols DC: 316.3 mg, WC: 0 mg). The Diopsys[®] mfERG stimulus consists of 19 hexagons pseudo-randomly reversed (white 204 cd/sqm., black 0.5 cd/sqm.) for four 1 min. periods. Mean responses were recorded from the central 5 deg. (R1: fovea), R2 (5 to 22 deg.) and R3 (22 to 42 deg.). Each subject was tested 45 minutes after consumption of the DC or WC bar in separate, counter-balanced sessions separated by at least 72 hours. Double-blinding was assured by having subjects

consume each bar wearing eye patches and experimenters were unaware of the chocolate type.

Findings: Two-way analysis of variance across mfERGs and chocolate type (DC vs. WC) showed no difference between DC and WC for N1-P1 amplitude ($F=.03$, $p>0.8$) or P1-N2 amplitude ($F=1.1$, $p>0.2$). However, P1 latency was significantly shorter for DC vs. WC ($F=7.3$, $p < 0.01$). DC foveal latency was 39 msec. vs. 42 msec. for WC ($p < 0.02$). Summation of all latencies were significantly shorter for DC (112 msec.) vs. WC (117 msec., $p < 0.02$). Throughput, which combines amplitude and latency and is calculated as the ratio of P1-N2 amplitude/latency showed a significant increase for DC vs. WC ($p = 0.05$). P1-N2 amplitude is related to optic nerve function consistent with our recent evidence for decreased VEP latencies after DC. Acute consumption of a DC bar decreased mfERG latency and increased throughput consistent with faster processing revealed by shorter VEP latency and in agreement with improved contrast sensitivity (Rabin et al.). Small DC visual enhancements in healthy individuals may underestimate potential improvements in elderly and/or diseased patients who may benefit more from improved blood flow and/or antioxidant effects of cacao rich flavanols in DC.

Rabin et al. JAMA Ophthalmol. 2018;136(6):678–681.

Health and Medical Sciences

Short Term Exposure to Cool (bluish) vs. Warm (yellowish) Displays Enhances Foveal Temporal Contrast Sensitivity

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Mission Driven Research

The plethora of LED and LCD displays present more blue light than that presented by older displays such as CRTs. Blue light is higher in frequency than longer wavelength light and too much blue light can be damaging to the eyes. It also has been associated with eyestrain. We used a novel approach to compare short term effects of a bluish display vs. a yellowish display on measures of visual performance exemplifying innovation and enhancing knowledge and education.

Project Abstract

Purpose: To determine the effects of short-term exposure to a bluish display compared to a yellowish display on temporal contrast sensitivity (CS) and visual evoked potentials (VEPs).

Rationale and Significance: There is evidence that displays which emit substantial blue light (e.g., cell phones, tablets, LED computer displays) produce visual symptoms of eyestrain collectively known as Computer Vision Syndrome. However, studies have challenged these findings questioning the role of blue light in CVS. Most studies have compared blue-blocking (yellowish) filters to grey (neutral) filters after at least one hour of computer use. A metric to assess CVS following blue light exposure has been the highest flicker rate one can perceive though it is unclear why this metric has been used. In the present study we used a novel approach to compare bluish to yellowish displays by adjusting the color characteristics of an iPad display. Temporal CS, the lowest contrast necessary to detect a flickering striped pattern and visual brainwaves (VEPs) were measured before and after playing a challenging video game with each display.

Methodology: FDT perimetry, which presents flickering stripes of variable contrast, was used to quantify temporal CS supplemented by VEPs measured in response to rapidly reversing checkerboard patterns. These measures were conducted immediately before and after 10 minutes of exposure to an iPad during which the subject played Memorama Classic, a game of memorization skills composed of 5 levels where images are shuffled and placed face down on the screen. The player uses touch interface to discover two pictures which form a pair. iPad settings were adjusted to present the game in cool format (bluish, x,y chromaticity: x=0.144, y=0.061, luminance 26.3 cd/sqm.) and in warm format (yellowish, x,y chromaticity: x=0.473, y=0.437, luminance 26.4 cd/sqm.). Each subject was tested with each display in separate sessions with the order of testing counter-balanced across subjects. A total of 27 healthy, visually normal adult subjects (mean age \pm SD = 27 years \pm 3, 18 females, 9 males) participated after providing written informed consent in accord with our IRB approved protocol.

Findings: Contrary to prior studies showing decreased flicker detection after exposure to blue light displays, we found a slight enhancement in foveal temporal CS for an equal brightness cool (bluish) display (mean 3.11 log CS) compared to an equal brightness warm (yellowish) display (mean 2.98 log CS, paired 2-tailed t-test, $t = 2.41$, $p = 0.023$). CS and grating resolution (similar to visual acuity) estimated from VEPs also were slightly higher after exposure to the bluish display but results did not reach significance ($p = 0.265$). These findings suggest that short-term exposure to bluish displays may enhance temporal processing, possibly due to greater vigilance required to complete the task with the bluish display, as several subjects remarked that it seemed more challenging with blue display. We are also investigating a possible role for individual cone mechanisms which may influence the results.

Health and Medical Sciences

Normative Values and Repeatability of the Cone Contrast Test-HD

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Mission Driven Research

This research establishes normative values for an innovative new version of the Cone Contrast Test which will enhance detection and diagnosis of color vision deficiency and eye disease.

Project Abstract

Purpose: The purpose of this study was to establish normative values and repeatability of a new test of color vision: The Cone Contrast Test-High Definition (CCT-HD).

Rationale and Significance: Hereditary color vision deficiency (CVD) is a common condition in 8% of males and 0.5% of females. CVD also can be acquired as an early sign of various diseases. CVD can increase error rate and reaction time in cue-limited settings, where color discrimination is essential for critical tasks. Most color book tests detect CVD but fail to diagnose type (red, green or blue) or severity, important for matching performance to occupational demands. The computer-based Cone Contrast Test (CCT; Innova Systems, Inc.) diagnoses type and severity by presenting letters visible only to red, green or blue sensitive cones. A colored letter appears briefly in the center of the display and the patient uses a mouse to select the letter seen from an adjacent matching display. An adaptive staircase changes letter contrast (like a hearing test) to determine the lowest red, green and blue contrast seen. Konan Medical recently developed a similar approach (CCT-HD) with which achieves lower contrasts coupled with a modified stimulus. Herein we describe normative values and repeatability.

Methodology:

The CCT-HD uses an LCD which presents the letter C in the center of the display with the gap in the C at one of four different orientations: right, left, up or down. The observer selects the orientation of the gap by depressing one of four arrow-shaped buttons on a hand-held input device. As in the original CCT, a response-based staircase is used to determine the lowest red, green and blue cone color contrast seen. Each subject was tested twice with the preferred eye. 26 visually normal young adults with normal color vision (25 ± 3 years, 17 females, 9 males) were tested after signing an informed consent document in accord with our IRB approved protocol. An additional male subject with green CVD was tested as well but his data were analyzed and will be presented separately.

Findings: Two-way repeated measures ANOVA across measurement number (1st or 2nd) and cone type (red, green and blue) revealed no significant difference between 1st and 2nd measurements ($F=1.0$, $p>0.3$) but a significant difference between scores for each cone type ($F=684.9$, $p<0.001$). Post-hoc two-tailed paired t-tests revealed that the mean red cone log contrast sensitivity score ($\log CS = 2.10$) was significantly higher than the green cone score ($\log CS = 2.05$, $p < 0.007$) and higher than the blue cone score ($\log CS = 0.95$, $p<0.001$), and the green score was higher than the blue ($p < 0.001$), consistent with cone numerosity. The coefficient of repeatability (95% confidence interval for within-subject change) was 0.26 logCS for red and green tests and 0.39 for the blue test; hence if a patient's score changes by more than these amounts then the change is significant. The green CVD showed a selective decrease on the green test. The CCT-HD is a promising new test with enhanced range and excellent repeatability.

Health and Medical Sciences

Quantification of the Visual Field using a Standard Whiteboard

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Mission Driven Research

This innovative research validates use of a standard whiteboard as a metric for measuring peripheral vision in patients. It is hoped that this innovative technique will facilitate earlier detection of eye disease, particularly in austere settings lacking advanced field testing systems.

Project Abstract

Purpose: The purpose of this study was to develop and validate an expedient measure of visual field testing using a white board readily available in educational and clinical settings.

Rationale and Significance: In addition to visual acuity (smallest letters one can read), a patient's visual field (ability to see off to the side) is a cornerstone of visual care. Loss of visual field can occur in blinding diseases such as glaucoma, night blindness (retinitis pigmentosa) as well as numerous retinal and neurological diseases. State-of-the art computer-based testing is the clinical standard for measuring visual fields, but screening fields can be measured by the primary eye care clinician to identify telling signs of eye disease. The tangent screen, consisting of a wall-mounted black felt test field has been used for years to measure the size of the visual field and blind spot projected by the optic nerve head, as well as "holes" (scotoma) in the visual field. However, tangent screens are much less common in clinical care which impedes our ability to measure the field and blind spot size (which can be enlarged with brain tumors) in austere settings lacking advanced visual field systems. Since whiteboards are common in private and university clinics and hospitals, we developed a novel

technique utilizing a whiteboard-based measure of the visual field.

Methodology: Each subject stood 1m away from the whiteboard fixating a black "X" at eye level with their preferred eye. A white metal wand with a 3 mm (0.2 degree) black circular target at its end was used to measure the horizontal field and blind spot in 26 visually normal young adults (27 ± 3 years, 17 females, 9 males). While each subject fixated the central "X", the target was move outward until it disappeared and reappeared to determine the horizontal extent of the blind spot and endpoints of the visual field. Endpoints were marked with a yellow marker not visible to the subject. Two measures were conducted to assess repeatability. All subjects provided written informed consent in accord with our IRB approved protocol.

Findings: Two-way repeated measures ANOVA across the two measures showed no overall difference indicating high repeatability ($F = 0.05$. $p > 0.8$). Indeed, the blind spot horizontal diameter was not different between measures one (5.4 deg.) and two (5.3 deg., $p > 0.7$) with similar results for the total horizontal field: measures one (47.3 deg.) and two (47.2 deg., $p > 0.7$). Consistent with prior studies the temporal field (mean 32 deg.) was larger than the nasal field (mean 25 deg., $p < 0.001$). The coefficient of repeatability (95% confidence interval for within-subject change) was 2.8 deg. for the blind spot and 3.1 deg. for the horizontal field indicating that a patient would have to exceed these values to show significant change over time. Our findings indicate that the whiteboard field test is an accurate and repeatable screening test which should prove useful in standard and austere settings affording the clinician an inexpensive, rapid technique to quantify important aspects of the visual field.

Health and Medical Sciences

Evaluation of the Influence of Depression on ESRD Patients' Adherence to Dialysis Treatment

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Mission Driven Research

Our research reflects the core values of UIW's mission. We are not only attempting to educate our peers, but the community as well. The poster will not only communicate the analysis findings, but will display a global perspective with an emphasis on serving the renal community.

Project Abstract

Purpose: To determine if relationships exist between depression score and adherence to treatment.

Rational and Significance: Research has shown a link between depression and poor outcomes in ESRD patients. Screening for depression is a Center for Medicaid and Medicare (CMS) standard for all dialysis clinics with approved use of the PHQ-2 and PHQ-9 tools.

Methodology: This is a correlational study using retrospective record review. Spearman's Rank Order correlation was used to determine relationships. Adherence to treatment was defined by the number of missed treatment and hospital days.

Findings: There were 44 participants, 23 were female (52%), 65% Hispanic, with a mean age of 71.48 (range 33-97). PHQ 9 results indicated 32% were depressed. Mean Hemoglobin was low at 10.5, 10.7 in males and 10.5 in females. The p value for PHQ and missed treatments is .419. There is a significant positive correlation between the depression score and the number of hospital days of $r = .468$ ($p = .001$). Missed treatments and hospital days $r = -.780$ ($P < .001$) suggest the patient missed treatments due to hospitalization. Low hemoglobin levels and hospital days indicate a negative correlation $p = .038$. These results indicate that depression and hemoglobin may be factors in compliance causing increased hospital days. Limitations include a small sample, no information on length of

time on dialysis, presence of comorbidities, and referrals for depression treatment. Psychiatric referral for depressed patients and better management of hemoglobin may improve compliance with treatment.

Health and Medical Sciences

Unraveling retinal fibrosis through microRNAs

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Mission Driven Research

This work aims to study the molecular mechanisms that mediate proliferative vitreoretinopathy, a devastating ocular disease secondary to ocular trauma for which currently there is not a successful treatment. Results from this work may provide potential new avenues to inhibit vitreoretinal fibrosis and contractile responses after a penetrating ocular injury. This project supports educational excellence, search and communication of truth, and thoughtful innovation and thus reflects our university core values and mission.

Project Abstract

Purpose: This study aims to assess the role of microRNAs in the phenotypic changes observed in RPE cells after penetrating ocular trauma. We hypothesized that microRNAs (miRNAs) may mediate fibrotic changes in injured RPE cells and thus be involved in proliferative vitreoretinopathy (PVR).

Rationale and Significance: This work aims to study the function of microRNAs in the development of PVR, a leading cause of vision loss in children and young adults for which there is not a successful treatment. The formation of fibrocellular membranes and secondary retinal detachments are critical in PVR pathogenesis but the precise mechanisms underlying the phenotypic changes observed in wounded RPE cells remain elusive. Results from our work may provide potential new avenues to inhibit vitreoretinal fibrosis and contractile responses after penetrating ocular injury.

Methodology: We used Secrete-Pair Dual Luminescence Assay Kit (GeneCopoeia) to measure the activity of the fibrosis mediator alpha smooth muscle actin (α -SMA) promoter in ARPE19 cells transfected with miRNA mimics, hairpin inhibitors, or negative controls

(Dharmacon). Activation of α -SMA promoter was assessed in the transfected cells via immunofluorescence and using mouse anti- α -SMA (primary) and AlexaFluor 568 Goat anti-Mouse (secondary) antibodies (1:100 dilution; Abcam). Gene expression was quantified via qPCR using the delta delta CT method with 18S as endogenous control. Cells were treated with the α -SMA inducer TGFB2 (10 ng/mL; positive control) and transfected with the microRNA mimic, hairpin inhibitor, or negative controls. Data was collected at days 2, 3, and 6 post-transfection. At least 2 independent experiments were performed with triplicates.

Findings: Using an in vitro model of PVR, we identified 11 differentially expressed miRNAs (DEmiRs) potentially involved in RPE fibrosis. Our luciferase reporter assay showed increased α -SMA promoter activity in ARPE19 cells after transfection with 6 of the 11 miRNA mimics compared to their negative controls (up to 70% increase at day 6). Transfection with a single miRNA hairpin inhibitor reduced the expression of the α -SMA promoter in cells treated with TGFB2 by 2-fold as well as expression of α -SMA protein at days 3 and 6 via immunofluorescence. The effect of this hairpin inhibitor on α -SMA expression was confirmed at the RNA level (~50% reduction) using a TaqMan gene expression assay (ThermoFisher).

Our results were consistent with a potential role for miRNAs in the phenotypic changes associated with RPE transdifferentiation into myofibroblast-like cells. Future work aims to explore these and other DEmiRs as potential markers and therapeutic targets for PVR.

Health and Medical Sciences

NR2E3 Gene Aids Diagnosis of Pediatric Night Blindness.

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Mission Driven Research

This poster reflects the mission and core values by: providing at no cost to the patient genetic testing that otherwise would cost thousands of dollars. It reflects service by enabling our patients to obtain information about their eye condition so that they can make informed decisions about their future including family planning and vocational. It provides education to the patient, their family, and students. It also helps on a national scale as they are contributing information to a database that identifies blinding orphan diseases so that more research and education can be provided to families and researchers alike.

Project Abstract

Purpose: To identify and confirm an unclear diagnosis for CR, a 4-year-old Hispanic male, who had complaints of poor night vision.

Rationale and Significance: Having the diagnosis of NR2E3 confirmed that CR had a condition that overlaps with Retinitis Pigmentosa (RP) and Fundus Albipunctatus (FA) called Retinitis Punctata Albescens (RPA). This progressive condition has a poor diagnosis, so having this information is helping the family with planning for services to include school assistance, social security disability, and consider Braille training.

Methodology: An eye exam was performed, followed by a referral to the electrodiagnostic service for testing and then to low vision for a functional evaluation with genetic testing. Genetic counseling was also performed with the family.

Findings: Symptoms started a few weeks prior to the appointment and occurred in both eyes. No other eye or vision complaints reported. CR's birth and developmental history, and his family's medical and ocular history were unremarkable. Although CR was doing well in school, he was moved to the front of the

classroom due to his vision complaints.

CR's entering acuities uncorrected were 20/50 OD and 20/40 OS at distance and near. Pertinent exam findings included negative stereopsis and normal color vision with HRR Pseudoisochromatic Test. A large refractive error was found with damp retinoscopy: OD: +5.50-0.50x180 and OS: +5.00-1.25x180. Dilated fundus exam appeared normal in both eyes. A glasses prescription was released and education given on the effects of uncorrected refractive error. Close follow up care was stressed.

CR's first follow-up reported improvement with day and night vision with the prescribed glasses. Acuities of 20/40+2 were recorded OD/OS at distance and 20/25 OD/OS at near. Since improvement of vision and symptoms occurred but did not cease, we recommended continued monitoring and a return in 6 weeks.

At that visit, CR's mother reported no additional improvement in symptoms. Refractive error and visual acuities were stable. Due to improving but continuing complaint of night blindness, CR was referred for electrodiagnostic testing to further investigate night blindness complaints. A low vision referral was also made. A confirmation of a gene mutation, along with exam findings, symptoms, and electrodiagnostic testing concluded with a diagnosis of RPA.

Health and Medical Sciences

Lead molecule discovery for CNS diseases using the Psychoactive Drug Screening Program (PDSP)

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Mission Driven Research

This research has the potential to generate molecules which could heal human diseases. The work reflects the following UIW mission tenets: "education" (mentoring future health science researchers), "innovation" (creating potential new drug compounds) and ultimately "service" (an effort aimed at alleviating of human suffering).

Project Abstract

Purpose: To evaluate CNS receptor activity of a small library of compounds in search of anti-neurodegenerative molecules. To utilize the PDSP as a tool for CNS drug discovery. Potential drug activity determination is achievable using the PDSP tool.

Rationale and Significance: Compound screening is unavoidable for drug discovery and yet the PDSP tool is not well known by the UIW research community. Alzheimer's is a devastating progressive neurodegenerative brain disorder whose current pharmacotherapy is ONLY palliative. Therefore, there is an urgent need to develop disease modifying molecules against AD. To that end, novel small molecules targeting different mechanisms (different receptors) from the known clinical ones are being sought, and the PDSP can provide a quick way for evaluating promising compounds in vitro.

Methodology: A small diverse library of compounds was synthesized and submitted to the PDSP to test for CNS receptor binding affinities – to determine compound Ki values. Testing protocols/details are available at the PDSP website cited.

Findings: We have identified two lead molecules (49073 with selective sigma-1 receptor activity and 49057 selective 5HT-2B activity) from a total of 22 compounds submitted. Activities of these molecules will be optimized in follow up Structure Activity Studies (SAR).

Health and Medical Sciences

Dermatomyositis: A Delayed Diagnosis in an Uninsured Patient

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Mission Driven Research

UIW School of Osteopathic Medicine's mission is to extend the healing ministry of Jesus Christ to our neighbors from all walks of life. In addition to evidence-based, case-based learning, we are being trained to be culturally cognizant and community-centered physicians. The following case represents an all-too-common situation in which patients' health are at risk due to an uninsured status.

Project Abstract

Purpose: The following case describes the prolonged process that uninsured patients must endure before a final diagnosis can be made and management underway. Specifically to rheumatology, the required care necessary for these diseases presents additional challenges.

Rationale & Significance: Dermatomyositis is amongst the idiopathic inflammatory myopathies that manifest with muscular weakness, elevated serum muscle enzymes, and photosensitive dermatitis. We describe a case of longstanding, undiagnosed dermatomyositis complicated by diagnostic delay related to the patient's lack of health insurance.

Methodology: N/A

Findings: A 29-year-old female presented to a Federally Qualified Health Center Rheumatology clinic (FQHC-Rheum) for evaluation of facial swelling, myalgia, and photodermatitis. In the preceding two years, she presented multiple times to emergency departments and acute-care clinics. After presenting to a student-run, dermatology clinic, the patient was instructed to undergo evaluation by a rheumatologist. She presented to the FQHC-Rheum clinic with an erythematous, maculopapular rash. She exhibited normal muscle strength (5/5) in the proximal extremities and neck muscles. Laboratory analysis revealed minimally elevated ALT and AST concentrations, normal creatine kinase (CK) concentration (131 U/L; reference: 26 – 192) and a negative anti-nuclear antibody (ANA). An autoimmune connective tissue disease was suspected, however further evaluation was halted due to the patient's financial status. Two months after initial presentation to the FQHC-Rheum clinic, the patient

returned with moderate weakness and worsening photodermatitis. Despite normal CK levels (81 U/L), muscle strength testing revealed proximal hip flexor weakness (3+/5), and the patient was diagnosed with dermatomyositis. She elected to forego an extremity MRI, electromyography, muscle biopsy, and screening CT scans due to prohibitive costs. The patient subsequently obtained Medicaid health insurance, and a thigh MRI confirmed the diagnosis of dermatomyositis nearly 36 months after symptom onset.

Discussion: Patients with dermatomyositis often endure long diagnostic delays. An uninsured status furthers limits the prompt and accurate diagnosis of rheumatic disease [1]. Typically, the diagnosis of dermatomyositis is based upon a clinical presentation of muscle weakness, elevated serum muscle enzymes, electromyography findings, MRI results and characteristic muscle histopathology [2].

Conclusion: A lack of health insurance had detrimental effects on the timing and quality of care provided to our patient with dermatomyositis. Initially, she had limited access to specialty care and chose not to pay for cost prohibitive procedures and imaging studies. A recent member survey of the American College of Rheumatology revealed the most common practice-related ethical issues in Rheumatology involve the cost of expensive treatments and the care of uninsured/underinsured patients [4]. These issues proved to be at the forefront of this patient's care.

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Health and Medical Sciences

Delayed Sleep Onset and its Impact on Academic Performance

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Mission Driven Research

Sleep deprivation has been linked to a variety of health conditions (hypertension, depression, inflammation, etc.) and associated with accidents due to human error. As we look to educate our students, it is imperative we consider the physiological and psychological impact of their busy academic schedules and develop strategies to encourage positive lifestyle habits.

Project Abstract

Purpose: Significant research into academic achievement has focused on external factors such as teaching styles, learning resources and technology. This study aims to evaluate sleep patterns in relation to academic performance among optometry students.

Rationale and Significant: Demanding professional program schedules force students to make difficult decisions regarding their lifestyle habits (eating, sleeping, exercise, etc.) without appreciating the impact on academic performance. Within this study we aim to examine the relationship between personal sleep habits and academic performance among optometry students. Prior research investigating academic performance and sleep (Zeek et al., 2015) found a majority of pharmacy students received less than 7 hours of sleep during a typical school week. They also noted a positive correlation between increased sleep duration and higher course grades and grade point averages (GPAs). Unfortunately, many sleep studies have relied on self-reported data.

By using wrist-based accelerometers we look to merge self reporting and passively collected data to help our students better understand the relationship between sleep habits and academic performance.

Methodology: This longitudinal study was conducted during the Spring/Summer semesters when we observed optometry school students (OPT1-OPT4) taking at least 16 credit hours. The study protocol was approved by the Institutional Review Board. A pre-study Lifestyle Habits

Questionnaire was administered to collect self-reported data in the following areas:

- Typical Bedtime
- Typical Wake time
- Time required to fall asleep
- How poor sleep has impacted day to day productivity
- Duration of poor sleep patterns (acute vs chronic)

Three wrist based accelerometers (MiBand 2. Beijing, China, AutoSleep Application. iOS, Fitbit Activity Tracker. Fitbit Inc., San Francisco, CA) were used to monitor bedtimes, wake times and sleep duration for 30 days (14 day minimum). Data was analyzed using Google Sheets (Mountain View, CA) and XLMiner Analysis Toolpak to compare subjective responses, measured sleep habits and GPAs.

Findings: 21 professional school students (81% female) aged 24.9 \pm 1.5 enrolled in our study. On average, students receive 7:39 hours of sleep per night. They also receive significantly less sleep during the week than the weekend (7:21 vs 8:03, respectively [$p=0.03$]). Sleep duration did not correlate with GPAs ($R^2=0.01$). Our most significant correlations with academic performance included earlier bedtime during the week ($R^2=0.48$) and consistency of bedtime during the week ($R^2=0.55$). Weekend bedtime [$R^2=0.18$], wake time [$R^2=0.13$], or sleep duration [$R^2=0.11$] showed weak correlations with GPA. Students who reported chronic sleep issues also had a more variable sleep schedule ($R^2=0.40$) and worse GPAs ($R^2=0.42$). This study highlights the importance of establishing a consistent sleep schedule. Students with less variable sleep schedules during the weekday were less likely to report chronic sleep problems and performed better academically. Future studies should consider the impact technology has on maintaining a consistent sleep schedule and strategies to encourage better sleep habits.

Health and Medical Sciences

Perception vs. Reality: Comparing Students' Impression of Self-Reported Sleeping Habits with Actigraphy Data

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Mission Driven Research

As we seek to educate our students, innovative learning approaches need to be explored. We look to explore an often undervalued area of student behavior, sleep. By allowing students to understand their sleep habits more intimately, we hope to highlight its value and impact on academic achievement.

Project Abstract

Purpose: This study examined the relationship between self-reported sleep habits and wrist-based accelerometer data.

Rationale and Significant: Most sleep studies rely heavily on subjective reports of exposure (bed time, wake time, duration, etc.) and outcomes (academic performance), with the inherent risk of reporter bias. We aim to passively collect sleep data using various wrist-based accelerometers designed to track movement and relate those findings to self-reported sleep habits.

Methodology: This longitudinal study was conducted during the Spring/Summer semesters where we observed optometry school students (OPT1-OPT4) taking at least 16 credit hours. The study protocol was approved by the Institutional Review Board. A pre-study Lifestyle Habits Questionnaire was administered to collect self-reported data in the following areas:

- Subjects Typical Bedtime
- Subjects Typical Wake time
- Time required to fall asleep
- How poor sleep has impacted the subjects day to day productivity
- Duration of poor sleep patterns (acute vs chronic)
- Perception of classmates sleep duration

Three wrist based accelerometers (MiBand 2. Beijing, China, AutoSleep Application. iOS, Fitbit Activity Tracker. Fitbit Inc., San Francisco, CA) were used to monitor bedtimes, wake times and sleep duration for 30 days (14 day minimum). Data was analyzed using Google Sheets (Mountain View, CA) and XLMiner Analysis Toolpak. Paired t-test was performed to compare subjective responses with measured sleep habits.

Findings: 21 professional school students (81% female) aged 24.9 ± 1.5 enrolled in our study. On average students underestimated their perceived bedtime (11:14 PM) compared to actual bed time (12:06 AM) by almost an hour ($p=0.003$). They were just as inaccurate when recalling their average wake time (6:46AM vs 7:45AM, $p<0.0001$). Reported sleep duration was similar to actual sleep duration (7:32 hrs vs 7:39 hrs, $p=0.641$). Compared to their peers, students believe their classmates receive 1 hour less sleep per night (7:39 hrs vs 6:18 hrs, $p<0.001$). Sleep plays a vital role in one's physical health affecting the body's ability to heal and repair. Insufficient sleep over extended periods of time can lead to reduced concentration and academic performance. Our study raises the question, by equipping students with an unbiased look into their own sleep patterns, can we promote better sleep hygiene?

Health and Medical Sciences

Exploring Job Satisfaction and Workplace Engagement in Millennial Nurses

Waltz, Lee Ann, PhD, RN, CNE; University of the Incarnate Word

Munoz, Laura, PhD, RNC, NNP; University of the Incarnate Word

Weber-Johnson, Holly; MSN, RN; Northeast Methodist Hospital

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Cantu, Debbie, DNP, RN; Northeast Methodist Hospital

Mission Driven Research

This study reflects the university's core values of truth and innovation. With an improved understanding of the factors affecting the job satisfaction and workplace engagement of millennial nurses, innovative strategies can be planned to enhance support for these nurses as they care for patients in our community.

Project Abstract

Purpose: The purpose of this study was to assess job satisfaction and workplace engagement of millennial nurses working in a large metropolitan hospital.

Rationale and Significance: A recent employee survey conducted by a large the hospital system revealed less engagement and decreased job satisfaction in nurses born between 1980-2000. This group can be identified as belonging to the millennial generation. It is concerning to hospital administrators that there is a higher turnover rate in this population which warrants attention.

Review of Literature: There is a well-acknowledged nursing shortage that is expected to increase as aging nurses leave the workforce. Retention of the current nursing workforce also poses a challenge for nursing administrators. There is strong evidence to support the relationship between job satisfaction and retention (Wilson, Squires, Widger, Cranley, & Tourangeau, 2008). There are many personal characteristics such as age, gender, and educational level which influence job satisfaction. One characteristic revealed generational differences related to job attitudes (which included work engagement; turnover intentions; incentives and disincentives to continue employment) and emotion-related job aspects (e.g. job satisfaction and affective commitment) (Stevanin, Palese, Bressan, Vehviläinen-Julkonen, & Kvist, 2018).

Methodology: A phenomenological qualitative approach was used to assess the perception of millennial nurses

related to job satisfaction in a 200-bed private hospital located in a large South Texas city. A purposive sample of 33 millennial nurses were recruited to participate in focus groups composed of nurses who self-identified as being within the millennial generation. Semi- structured interviews were used during the focus groups to gather participants opinions regarding issues affecting job satisfaction and engagement in the workplace.

Findings: Thirty-three study participants ranged in age from 23 to 35 years (mean = 28). The majority (85%) were female with 39% Hispanic, 35% Caucasian, 13% Asian, 10% African American, and 3% Other. Employment status included both part time and full time. Results of the focus groups revealed six themes: 1) Rewards- Verbal and written praise for doing a good job was highly valued. 2) Professional Relationships- Positive relationships with coworkers was the factor most frequently identified regarding job satisfaction. 3) Communication- Preferences for communication from their employer included apps such as Crew or Facebook, texts, email, or face to face. 4) Professional Development- Barriers to participating in professional activities include lack of time, financial burden, and low priority. 5) Workload/Staffing- The need to maintain adequate levels of staffing were viewed as a high priority. 6) Processes to Improve Safety- Suggestions included improving the reporting process for patient transfer between units, and ensuring adequate resources for safety equipment.

Conclusions: There is a lack of evidence describing interventions tailored to the needs and attitudes of specific generations. The information gained from this study helps to inform nursing administrators who are interested in understanding the perceptions of millennials. Information gathered may aid in the development of effective strategies to improve job satisfaction and engagement and subsequently, improve retention.

Health and Medical Sciences

Visual Plate Waste Analysis of Residents Living in a Long-Term Care Facility to Better Detect Risk of Malnutrition

Wildey, Shannon, MS; University of the Incarnate Word

Mission Driven Research

The first Sisters of Charity of the Incarnate Word came to San Antonio to minister to the sick and the poor. Throughout my trial I studied the health and wellness, as well as plate waste of select residents at a long-term care facility in the San Antonio area. I developed an updated visual plate waste numerical tracking system that could better help detect risk of malnutrition. I hoped to follow in the footsteps of the first Sisters of Charity of the Incarnate Word through my research and studies as a graduate student.

Project Abstract

Purpose: To study amounts and types of foods leftover following meals as plate waste as this may be crucial in evaluating a resident's risk for malnutrition. This may be helpful in developing steps for an individualized treatment care plan in the future. To successfully test an updated visual plate waste numerical tracking system in a long-term care facility. This system should be simple, easy to teach, and most importantly accurate so that poor intake and risk of malnutrition can be identified more rapidly and in a cost-effective manner, allowing for faster implementation of workable solutions for residents.

Rationale and Significance: Malnutrition is an ongoing problem in residents of long-term care facilities. Risk of malnutrition can come from a lack of food consumption, as well as not meeting daily vitamin, nutrient, and caloric goals. One way to assess risk of malnutrition of residents in long-term care facilities is by plate waste analysis. Studying amounts and what types of foods are leftover following meals may be a crucial step in evaluating a resident's risk for malnutrition, as well as help to develop steps for an individualized treatment care plan.

Methodology: A simple correlational trial was conducted in order to test reliability of visual plate waste analysis in weekly measures over an eight week period in comparison to kilocalorie consumption as well as residents' average weights.

Findings: Accuracy measures were as follows: Percent kcal vs. percent plate waste score (p-value .034). Percent plate waste score vs. average weight (p-value .013). Average weight vs. percent kcal (p-value .005). Data indicated that this method of visual plate waste numerical tracking was successful in identifying trends in plate waste and kcal consumed. The tracking system has the potential to be used to identify risk of malnutrition in long-term care residents.

Interdisciplinary

Refugee Livelihood: Understanding the Vocational Training Experiences of Foreign Refugee Women Living in Malawi

Davis, Mary P. , PhD; University of the Incarnate Word

Mission Driven Research

This research reflects the mission and core values of the University of the Incarnate Word through the intent of the researcher to encourage and enlighten others to become active global citizens in the context of social justice and the human right to an education.

Project Abstract

Purpose: Research Focus. With Africa holding 26% of the world's refugees it is critical to understand the impact of educational opportunities that are accessible for refugees in Africa, especially in the context of African women who are historically excluded as the primary target for education (UNHCR, 2018). In response to the need for quality education for refugee women, Malawi's vocational training and secondary education institutions have centered on activities to increase opportunities for formal secondary education of both refugee and Malawian women (A National Report of Malawi, 2008).

Rationale and Significance: As opportunity and awareness of quality secondary education for refugee women becomes more prevalent, there is a need to understand the value of such programs through the lens of participants who are African refugee women and how these programs have influenced their sense of livelihood. For these reasons, this study explored the individual experiences of African refugee women focusing on how their experiences in completing a vocational training program have influenced their lives in terms of self-efficacy and empowerment in creating a livelihood.

Methodology: A qualitative approach employing a phenomenological case study design was utilized for the study. Participants were solicited using purposeful selection resulting in 9 African refugee women who currently reside at the Dzeleka Refugee camp, who were a minimum of 18 years of age, and who had completed a vocational training program at a vocational training center. Data collection was conducted by the primary researcher and included a triangulation of data-

gathering activities including semi-structured interviews, researcher observations, memos, and field notes. The analysis was approached employing emic coding to provide first cycle themes that were then subsumed resulting in 4 major themes of education, livelihood, self-efficacy, and empowerment, with associated subcategories.

Findings: Participant livelihood experiences were influenced in varying degrees as a result of their vocational training. Some participants gained a level of economic independence as a result of their training. Others found a voice that clearly states their desire to have the same access of job opportunities as men. Vocational training was perceived by participants as a positive influence on livelihood capabilities as well as their positive feelings of self-efficacy and empowerment. However, education alone was only part of these outcomes, as other experiences of relationship building, creating alternative solutions for income producing activities, and sharing their knowledge also influenced their feelings of self-efficacy and empowerment

Interdisciplinary

Relationship Between Emotional Intelligence Factors & Perceived Stress in Graduate Dietetic Students

Frazier, Heather, PhD, RDN, LD; University of the Incarnate Word

Ocker, Liette, PhD; Ocker Consulting, LLC

Araas, Teresa, PhD, CHES; Rocky Mountain University of Health Professions

Blackburn, Sara, DSc, RDN; Indiana University

Mission Driven Research

This research helps to enlighten the field of nutrition and dietetics with the potential need for developing EI among dietetics students. Students that become competent dietetics practitioners, with the ability to regulate emotions, may be better able to serve the community.

Project Abstract

Purpose: To identify the relationships between emotional intelligence (EI) factors and perceived stress of graduate dietetic students in Combined Master of Science and Dietetic Internship Programs.

Rationale and Significance: Dietetic students must be able to communicate with other members of the healthcare team as well as the public in order to be competent entry-level practitioners. Students that learn or develop EI during their dietetic education may be better able to endure the stress and have more effective emotional control skills necessary to be a competent entry-level dietitian.

Methodology: A total of 102 graduate dietetic students (97 female and 5 male) completed measures of EI and perceived stress in an online survey. EI and perceived stress were collected using the Schutte EI Scale and Perceived Stress Scale-10, respectively. Pearson-product moment correlations and multiple linear regression analyses were applied. Statistical significance was $p \leq 0.05$.

Findings: Total EI was positively associated with “appraisal of emotions” ($r = .824, p < .001$), “optimism and regulation of emotions” ($r = .750, p < .001$), and “intrapersonal and interpersonal utilization of emotions” ($r = .579, p < .001$). Perceived stress was negatively associated with “optimism and regulation of emotions” ($r = -0.532, p < .001$) and not associated with

the other two EI factors. The EI skill of intrapersonal and interpersonal communication encompasses the highest level of the EI model; however, graduate dietetic students, even as advanced beginners, are not yet fully competent at this level. There is a need for further research on EI among dietetic students as it relates to college health and professional competence.

Language and Literature

A Social Justice Project in a Beginning Spanish Class

Tallon, Michael, PhD; University of the Incarnate Word

Mission Driven Research

According to the UIW Mission Statement, “faculty and students support each other in the search for and communication of truth, thoughtful innovation, care of the environment, community service, and social justice” (www.uiw.edu/mission). Teaching students about social justice, therefore, is an important part of teaching at UIW. The purpose of this poster presentation is to demonstrate a social justice project in a beginning Spanish class in which students work in small groups to examine social justice issues in Spanish-speaking countries. This innovative approach, which follows the 1996 ACTFL Standards for foreign language education, allows students to develop their own perspectives of the new culture and the social justice issues, rather than just be lectured about the culture and the issues. This project fits in perfectly with the goal at UIW of teaching more of our students in a variety of classes about social justice, thus supporting the university’s mission “to educate men and women who will become concerned and enlightened citizens within the global community.”

Project Abstract

Purpose: This poster presentation will demonstrate a social justice project in a beginning Spanish class in which students work in small collaborative groups to examine social justice issues in Spanish-speaking countries. This innovative approach, which follows the 1996 ACTFL Standards for foreign language education, allows students to develop their own perspectives of the new culture and the social justice issues, rather than just be lectured about the culture and the issues.

Rationale and Significance: In 1996, the foreign language teaching profession in the United States published a set of standards for foreign language education. The purpose of this presentation is to demonstrate an actual project that was used to teach about social justice based on these standards. With increased globalization, it is important that we understand peoples of different cultures and issues they are experiencing. Social justice refers to the idea of creating a just society and recognizing the dignity of every person. U.N. Secretary-General Ban Ki-moon

stated in 2010: "As we face the consequences of the global financial and economic crisis, which has led to significant increases in unemployment and poverty and is straining social integration, these principles [of social justice] are more important than ever."

Methodology: With this project, students are required to identify several social justice issues in the Spanish-speaking world; communicate with agencies that represent the populations; identify and evaluate the past and current situations of the populations; recommend changes to respond to the issues; write an individual 4-5 page paper about the topic; and create a PowerPoint for a group oral presentation.

Findings: Participants will learn about a class project that involves collaborative learning and that allows the students to move from simple knowledge to the more advanced skills of analysis, synthesis, and evaluation. The presentation will include a sample lesson plan used in class, the 12-week semester plan, the assessment rubrics used by the teacher and students, student stories, and a sample final project.

Mathematical and Physical Sciences

Analysis of Metal Content in the Natural Springs of Manitou Springs, Colorado, Using Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)

Gonzalez, Edward, PhD; University of the Incarnate Word

Chaudhuri, Alakananda, PhD; University of the Incarnate Word

Miranda, Elijah; University of the Incarnate Word

Bass, Yesenia; University of the Incarnate Word

Mission Driven Research

My research activities were consistent with the Mission of the University of the Incarnate Word in increasing the scientific knowledge of the UIW undergraduate students as well as the community involved in K-12 education in promoting life-long learning and fostering the development of the whole person. This environmental research project engages the UIW undergraduate students in field studies and laboratory investigation which are consistent with the University Mission of serving more effectively the spiritual and material needs of the people through care of the environment and thoughtful innovation.

Project Abstract

Purpose: The purpose of this study was to analyze the total metal content of eight natural springs of Manitou Springs, Colorado. The objective was to investigate the levels of toxic and other metals following the standard EPA (Environmental Protection Agency) methods to assess the drinking water quality.

Rationale and Significance: There are eight active natural springs of Manitou Springs, Colorado, that are open to public. These are Cheyenne Spring, Shoshone Spring, Stratton Spring, Navajo Spring, Wheeler Spring, 7-Minute Spring, Twin Spring, and Iron Geyser. These artesian natural springs have existed for many years dating back to the early 1700's and are popular resort sites from the widespread myth of the healing properties of the natural springs, and the health-oriented American public eager for trying out the medicinal properties of the mineral springs due to the presence of dissolved natural minerals. The Environmental Protection Agency (EPA) has set federal standards of the amount of pollutants and metal ions allowed for safety in surface, potable and recreational waters under the Safe Drinking Water Act (SDWA) to regulate water quality and make sure it is safe for consumption and other uses. The specific aim of this study

is to assess the current conditions of the total metal content of the eight active springs of Manitou Springs, Colorado, and to provide data for future comparisons.

Methodology: The spring water samples were analyzed for 27 metals using inductively coupled plasma-mass spectrometry (ICP-MS) following the standard EPA method 200.8. Water samples were collected from eight operating natural springs that are located in the Manitou Springs downtown area, and within walking distance from each other. The collected water samples were immediately preserved with (1+1) nitric acid. The samples were settled overnight and then filtered through a 0.45µm Millipore filter. Weighed aliquots of water samples were acidified with (1+1) mixture of concentrated nitric acid and hydrochloric acid and refluxed gently using a hot water bath at temperatures between 93oC – 96oC for 12 hours. After cooling the digested samples were brought-up to 50 mL volume with nanopure deionized water. The water samples were then analyzed for 27 metal cations using a Bruker model 820 MS ICP-MS.

Findings: The analysis data were compared to EPA recommended safety limits for potable, surface and recreational water as well as standards approved by the Colorado Commission of Environment and Water Quality. The most abundant mineral ions detected in these eight springs were B, Ca, Mg, K, Na, Sr, and Ti with differences in mineral content in each spring which attributes to a distinct taste and flavor in each spring water. Only the Iron Geyser water sample showed the As concentration (0.009 mg/L) to be just below the permissible limit (0.010 mg/L) of EPA for drinking water guidelines. The remaining metals analyzed in all these eight spring water samples were well within the regulated limits of the EPA and the Colorado Commission on Environment and Water Quality.

Mathematical and Physical Sciences

Why Write in a Science Class?

Stampfl, Tanja, PhD; University of the Incarnate Word

Nair, Sreeranjini, PhD; University of the Incarnate Word

Mission Driven Research

This is an interdisciplinary project to enhance student learning and engagement across campus. This project comes out of the Writing Academy, which is one of the main initiatives in the university's current Quality Enhancement Plan.

Project Abstract

Purpose: This presentation shares evidence-based strategies to improve student learning and engagement inside and outside of the science classroom through informal writing. The presenters will demonstrate the findings of their study and illustrate specific strategies that can be implemented in any science classroom.

Rationale and Significance: Students in Physics classes at the University of the Incarnate Word often participate and engage only reluctantly with the material and show very spotty transfer between Physics classes and science classes in general. Students dread science because they perceive it as elite abstract knowledge that is memorized mostly through mathematical formulas, and the actual meaning of these quantities remains foreign to them. More recently, there has been a general push to use writing for learning in all disciplines, including STEM (Robertson & Taczak, 2014). These types of writing are mostly low-stakes and informal in nature, and are graded based on the students' engagement with and understanding of the course material rather than grammar, spelling, and traditional writing skills (Walvoord, 2014).

Methodology: We will share three strategies for reversing the existing negative/indifferent attitude towards science using various informal writing exercises: putting scientific formulas into words; connecting scientific processes to everyday life experiences, and inviting students to verbally re-examine their personal experience with science and in science classes. In-class short answer surveys and repeated verbal articulations of physical concepts were collected and assessed periodically throughout the

semester to determine the effectiveness of these strategies.

Findings: The results showed increased student engagement, improved knowledge, understanding, and articulation of physical concepts, improved classroom interaction, and a marked improvement in student confidence and attitude towards the subject matter.

Mathematical and Physical Sciences

Modeling the Dynamics and Control of Lyme Disease in a Tick-Mouse System Subject to Vaccination of Mice Populations

Carrera-Pineyro, Daniel; University of the Incarnate Word

Harley, Hanes; Tulane University

Litzler, Adam; The Ohio State University

McCormack, Andrea; North Central College

Velazquez-Molina, Josean; Arizona State University

Kribs, Christopher; The University of Texas at Arlington

Rios-Soto, Karen; University of Puerto Rico at Mayaguez

Mission Driven Research

The UIW Mission states "...search for and communication of truth, thoughtful innovation, care of the environment, community service, and social justice." This research project aims to find a plausible solution to Lyme disease with minimal disturbance to nature. The research is geared to find a control system to Lyme disease without harming its animal carriers. This possible control indicates that it would benefit populations which are heavily affected by this disease.

Project Abstract

Purpose: Lyme disease is one of the most prevalent and the fastest growing vector-borne bacterial illnesses in the United States, with over 25,000 new confirmed cases every year. Lyme disease cases have more than doubled in recent years, and the Centers for Disease Control and Prevention estimates that those numbers could be significantly underrepresented.

Rationale and Significance: Humans contract the bacteria, *Borrelia burgdorferi*, through the bite of *Ixodes scapularis*, commonly known as the deer tick or Eastern blacklegged tick. The tick can receive the bacterium from a variety of small mammal and bird species but *Peromyscus leucopus*, commonly known as white-footed mice, are the primary reservoirs in the northeastern United States, especially near human settlement. The life cycle and behavior of the ticks depends greatly on the season, with different stages of tick biting at different times. Reducing the infection in mice populations and the overall tick population may greatly reduce the number of humans affected by this disease in some parts of the affected region. However,

research on the effects of various mouse-targeted interventions is limited.

Methodology: One particularly promising method is the administration of vaccine pellets to white-footed mice through special bait boxes. In this study, we develop and analyze a mathematical model consisting of a system of non-linear difference equations to understand the complex transmission dynamics and vector demographics in both tick and mice populations. Later, we evaluate to what extent vaccination of white-footed mice can affect the population of infected *I. scapularis* and under which conditions this method is a cost-effective preventative measure against Lyme disease.

Findings: We find that vaccination can eliminate mouse-tick transmission of *B. burgdorferi* while saving money when instituted in areas with high human risk.

Philosophy and Religion

Something is Happening: The Samaritan Ethic in Martin Luther King, Jr.'s Civil Right Discourse

Blanton, Raymond, PhD; University of the Incarnate Word

Mission Driven Research

My research focuses on the civic and rhetorical dimensions of communication, media, and culture. Specifically, my work (and this project in particular) work toward the development of critical consciousness as it relates to being a concerned and enlightened citizen by drawing upon the "Samaritan ethic" in the life and work of Martin Luther King, Jr in the American civil rights movement with implications relevant for living in community today.

Project Abstract

Purpose: In this study, I am primarily concerned with the rhetorical and cultural significance of Martin Luther King, Jr.'s use of the Samaritan parable/ethic throughout his sermonic and civil rights discourse. Specifically, I argue that the story, widely understood as a simple moral tale of kindness, is actually a radical story of racial significance that King utilized to empower the American civil rights movement. I focus exclusively on King's use of the Samaritan ethic throughout the movement with a concerted focus on his final public address, "I've Been to the Mountaintop."

Rationale and Significance: In a day an age of xenophobia and amuck with racial tensions, this study draws upon the life and legacy of Dr. Martin Luther King, Jr. to ascertain and discern the rhetorical and cultural significance of his use of the Samaritan parable/ethic in the American civil rights movement. It is significant for better understanding the life and work of King and offering a substantive contribution toward becoming more concerned and enlightened citizens.

Methodology: My research design and methodology is rhetorical in nature and considers the Samaritan ethic as a case study and representative anecdote for better understanding and grappling with the civic implications of King's sermonic discourse in the American civil rights movement. In my doctoral work, I critically analyzed the entirety of his civil rights work with a specific focus on his use of the Samaritan ethic from 1955-1968.

Findings: In sum, Martin Luther King, Jr. utilizes road imagery as a rhetorical device throughout his civic and sermonic discourse in the American civil rights movement. In particular, the Samaritan ethic is employed as an enabling condition for realizing efforts of dignity and equality. I argue this should be explored with more depth to better understand the life and work of King and as it relates to addressing contemporary tensions in race relations.

Philosophy and Religion

Montaigne, Emerson, and the Affirmation of Ordinary Life

Edelman, Christopher, PhD; University of the Incarnate Word

Mission Driven Research

I would relate this project primarily to our mission values of truth, innovation, and education. It relates to truth and innovation in that I am attempting to develop a novel and true account of the these dimensions of the philosophies of Montaigne and Emerson, and the ways in which juxtaposing these two thinkers with each other can be fruitful for the purposes of understanding each of them individually as well as the ideas that they discuss. It relates to the value of education in that while my essay will be intended to benefit scholars, it will also be written in a way that makes it accessible to students and a general audience, insofar as it will not employ the sort of technical jargon that can sometimes impede the understanding of non-specialists.

Project Abstract

Purpose: The purpose of this study was to better understand the nature of Montaigne’s and Emerson’s affirmations of ordinary life, and to reflect on how juxtaposing their respective accounts could help us to understand the similarities and differences between their particular philosophical projects.

Rationale and Significance: This podium presentation, based on an essay that I wrote for Montaigne Studies, will focus on connections between Michel de Montaigne, the sixteenth-century French essayist, and Ralph Waldo Emerson, the American poet and philosopher who was among the first to attempt to develop a philosophy that was quintessentially American, and whose work was profoundly influential among the American philosophers who would develop the American school of thought that became known as “Pragmatism.”

The existence of such connections is uncontroversial among scholars. While most scholars focus their attention on the common form of skepticism purportedly shared by Montaigne and Emerson, others have drawn attention to connections between their respective moral philosophies. For instance, their work has been described as “democratic” and “egalitarian.” Yet precisely how the essays of Montaigne and Emerson

are democratic and egalitarian has not yet been adequately articulated by scholars. In this presentation, I locate one manifestation of their shared democratic and egalitarian sensibilities in the ways that Montaigne and Emerson both affirm ordinary life, or reject hierarchical conceptions of the human good in favor of the notion that the human good, or what is best, highest, and most admirable in human life, can be achieved regardless of one’s political, spiritual, or intellectual status in society.

Methodology: The research method employed was dialectical: essentially it boiled down to reading various essays written by Montaigne, comparing them to essays of Emerson’s, consulting the secondary literature, both on the respective moral philosophies of Montaigne and Emerson, and on the relationship between the two (in both English and French), and then developing an account of Montaigne’s and Emerson’s affirmations of ordinary life.

Findings: While Montaigne and Emerson differ over the best means of affirming ordinary life, they seem to agree that their audiences fail to appreciate the fact that the human good can be found in an ordinary and private life as well as in a distinguished and public life, and that this lack of appreciation is due more to a failure of moral imagination than it is due to a failure of discursive reasoning. Consequently, their respective affirmations of ordinary life take the form of attempts to challenge the moral imaginations of their respective audiences. While from some philosophical perspectives, it may appear that both authors make unsubstantiated claims in the course of their attempts to affirm ordinary life, I argue that this charge is misplaced and based on a failure to appreciate the fact that both authors seem to see the problem as requiring a poetic solution, so craft their essays accordingly.

Social Sciences

Online Evaluations and Student Gender Influence Expectation about Course Policy Exceptions

Boswell, Stefanie S., PhD; University of the Incarnate Word

Mission Driven Research

Education is a core value of the UIW Mission. Professor characteristics unrelated to teaching competence (e.g., gender, online reputation) likely influence students' perceptions of the professor as well as the nature of the interpersonal relationship the student and professor share. Influences upon this interpersonal relationship have significant implications for educational processes; for example, expectations about the professor-student interpersonal relationship shape students' intentions to seek academic assistance. Given the potential significant impact of these non-teaching-related professor characteristics on students' expectations, it is important to investigate their nuances and the circumstances under which they occur.

Project Abstract

Purpose: This poster presents findings about the effects of positivity or negativity of Ratemyprofessors.com's evaluations, professor gender, and participant gender on 1) intentions to request exceptions from a professor's attendance policies and 2) expectation that the professor would grant these exceptions. These findings originate from a larger project investigating effects of these variables on students' intention to request exceptions from a variety of course policies (e.g., assignment and exam) and their expectations that professors will grant these exceptions.

Rationale and Significance: On Ratemyprofessors.com, students read and provide anonymous ratings and narrative evaluations of professors (Ratemyprofessors.com, 2018). Exposure to Ratemyprofessors.com-style comments affects students' motivation to learn (Edwards & Edwards, 2013) and attitudes about courses (Kowai-Bell et al., 2011). Moreover, students are affected more by positive than negative evaluations (Kowai-Bell et al., 2012). Because students expect women professors to provide more "special favors" (El-Alayli et al., 2018), it stands to reason that students may expect women professors to grant their requests for policy exceptions. Given the expectation that women professors will grant these exceptions, they may be more likely to receive them compared to men professors. Moreover, student gender is also important

given that several studies have found men students expect greater special treatment than their women peers (e.g., Ciani et al., 2008).

Methodology: The study used quasi-experimental design in which participants (n=329; 60.2% women) read five evaluations of a fictitious professor and rated their 1) intentions to request attendance policy exceptions and 2) expectations that the professor would grant the exceptions using 9-point, Likert-type scales. Participants were randomly assigned to view evaluations for one of four individuals: positively evaluated woman, positively evaluated man, negatively evaluated woman, or negatively evaluated man. Participants also completed a demographic questionnaire.

Findings: This poster's analyses focus on participants' 1) intentions to request attendance policy exceptions to arrive late to class, leave early from class, and miss class and 2) expectations the professor would grant these exceptions. During analysis, the four experimental groups were crossed with participant gender (man or woman), creating eight groups total. Multivariate analysis found that evaluation positivity influenced intentions to request exceptions and expectation that the professor would grant exceptions. Moreover, evaluation positivity interacted with student gender. Follow-ups to the multivariate analyses found that participants were more likely to make attendance exception requests of positively evaluated professors and expect these professors to grant the exceptions, regardless of professor gender. Moreover, women participants reported greater expectation that positively evaluated professors would grant them exceptions to arrive late, leave early, and miss class. Men participants, however, did not vary in their expectations that exceptions would be granted when the professor was evaluated positively or negatively.

These findings suggest that professors with a positive online reputation can expect more requests for exception from class policies, i.e., "special treatment." They also suggest that the influence of student gender on expectations about these requests is more nuanced than previous research suggested. For women students, requests for exceptions may be made when specific professor characteristics (e.g., positivity) indicate likelihood of success.

Social Sciences

Can Informal Writing Lead to Deeper Understanding? A Pilot Study

Lockhart, Lisa K., PhD; University of the Incarnate Word

Meyer, Sara R.; University of the Incarnate Word

Mission Driven Research

This study supports the mission and core values of UIW as it attempts to identify methods that will support students' understanding of important course concepts and materials. If strategies such as informal writing are found to be effective in helping students to understand complicated primary source materials, we are demonstrating compassion towards students' needs and innovation in helping students' pursuit of truth.

Project Abstract

Purpose: This study is a pilot assessing whether informal writing (IW) helps students better understand the content of primary source readings as reflected in their final course grade. We expected that students utilizing IW in their History of Psychology course would perform better than those who did not.

Rationale and Significance: Upper-level classes often include original sources as part of the required course materials. In our program, History of Psychology is a capstone course; the majority of the readings are primary sources, many of which are quite challenging as they are complex, often using archaic language and writing styles. This study is a preliminary step in examining the practice of IW as a means to students' deeper understanding of the readings and thus to better performance in the course. Informal writing is a strategy that is used by instructors to not only improve students' writing skills, but to improve students' thinking skills (Bean, 2001; APA, 2011; Bertlesen & Goodboy, 2009). However, not as much attention has been given to the use of informal writing as a tool to augment students' understanding of original source materials.

Methodology: Students in the IW sections responded to a consistent set of writing prompts at unspecified times during the course. All were aware that these IW sessions may occur during any class period that a course reading was assigned. Students were allowed approximately 10-12 minutes to answer the questions

which assessed students' understanding of the main points of the reading, requiring them to include supporting evidence from the reading. Students were first asked to explain the main point of the reading from memory, then were able to consult the reading for supporting evidence. The only structural difference between the IW sections and the Non-IW sections were the inclusion (or exclusion) of these IW exercises.

Findings: Final course grades of 78 students across 5 semesters who used informal writing ($n = 43$) versus those who did not ($n = 35$) were compared via an independent samples t-test. Final course grades were adjusted so that points allocated for the informal writing aspect of the course would not artificially inflate IW section final grades. Contrary to expectation, students who utilized informal writing did not have significantly higher final course grades ($t(1,76) = 1.50$, $p = .14$; IW $X = 84.47$, $SD = 26.53$; NoIW $X = 77.71$, $SD = 11.70$). The current analysis is a pilot for a larger project examining IW effectiveness, so these results are informative. We are cautiously optimistic as the means are in the expected direction. We will continue to add to the dataset in an effort to increase the power of the study; the current power estimate is only approximately 30%. It is hoped that after more data are collected and a more concrete picture of the relationship between informal writing and understanding of course material is formed, the informal writing process can be refined to assist students in developing an understanding of primary source course materials in any course.

Social Sciences

Sexuality and Spirituality: Sexual Knowledge Based on Religious Services and LGBTQ+ Status

Alsareinye, Zane; University of the Incarnate Word

Martinez, Leslie, PhD; University of the Incarnate Word

Lara, Mercedes; University of the Incarnate Word

Mission Driven Research

We are proud that our research embodies the Core Values and Mission of UIW, where we aim to address access to sexual health knowledge by creating a more inclusive educational environment. Holding true to the Cardinal spirit and values of education, innovation, and social justice, we have an opportunity to influence policy and legislation. We especially emphasize the belief that individuals of any religion, gender, race, and culture deserve a liberal education. At UIW, we have a responsibility to represent those who are disenfranchised in the community. In many instances, the LGBTQ+ community is not adequately represented in global discussions of health issues. Specifically, inclusivity and truth in sexual education programs is essential to benefit all people, regardless of religion, sexual orientation, and gender identity. We believe that our contribution in this field can provide social justice to better serve distinct communities, such as religious and sexual/gender minorities, and to educate others about the issues surrounding members of the LGBTQ+. In the past, discussions of sexual education have been considered taboo; however, spreading the importance of sexual knowledge can help prevent unwarranted outcomes, such as sexually transmitted diseases or pregnancies. Lastly, we hope that presenting these findings can promote an open discussion of relationship between spirituality, religion, and sexual health.

Project Abstract

Purpose: This study examines the relationship between sexual minority status, religion, and sexual health knowledge. At times, religion-based doctrines specifically denote how sex-related topics are discussed and understood (Baker et al., 2015). Yet, the influence of religious and spiritual beliefs on sexual education program availability may limit the scope of knowledge than programs that encourage open dialogue across topics (Cornblatt, 2009). It is hypothesized that attending religious/spiritual services and one's designated membership as LGBTQ+ is related to sexual health knowledge accuracy.

Rationale and Significance: Religion and spirituality can help people reaffirm their personal lives with a positive outlook. LGBTQ+ populations have shown increased coping with discrimination when provided with self-explorations through religion and spirituality (Rosenkrantz et al., 2016). Educating youth about sexual health education benefits their future health status and overall well-being (Charest et al., 2016). Multiple paradigms and approaches have been implemented to teach children and adolescents about sexual health topics, such as

reproduction, contraception, and STIs. Kirby et al. (2004) found comprehensive sexuality education programs to be effective, for factual knowledge and prevention of undesired outcomes. Yet, examining long-term effectiveness of "abstinence-only" and "comprehensive" programs, Walcott et al. (2011) reported little to no differences in knowledge and safer sex practices.

Methodology: The data were collected as part of a larger study about sexual health knowledge. A national sample of U.S. citizen adults was recruited using Amazon Mturk (LGBTQ+: n = 102, 55% Male, 42% Female, 2% Non-binary; non-LBGTQ+: n = 97, 55% Male, 44% Female). Participants reported whether they regularly attended a religious or spiritual service. Amongst other measures, the participants were given a multiple-choice sexual health knowledge quiz, which had four domains: General knowledge, Contraception, STIs/STDs, and HIV/AIDS. For each domain, their score reflected the number of correct answers.

Findings: Data were analyzed with a 2 (Group: LGBTQ+/non-LBGTQ+) x 2 (Religious service: Attends/Does not attend) MANOVA. Multivariate tests only had a significant effect of religious service attendance on knowledge, $F(4, 192) = 6.961, p < .001$, partial $\eta^2 = .127$. Within the "General Knowledge," "Contraception Knowledge," and "STIs Knowledge," participants who attended a religious service scored significantly lower than those who do not attend services, regardless of LGBTQ+ status; no significant differences were found for religion and HIV/AIDS scores. No other main effect or interaction was found to be significant. Lastly, the frequency of religious service attendance was not significantly different between LGBTQ+ and non-LBGTQ+ groups ($t(79) = -.50, p < .960$). "Attending religious/spiritual services" was the only variable that mattered when assessing the group differences in sexual health knowledge. Contrary to expectations, differences in knowledge accuracy were not dependent on sexual minority status. The discussion will further explore the source and implications of these results. It is important to consider the mechanism through which attending services may be involved in the level of knowledge. For instance, the quest for knowledge and beliefs about sexual acts are related to the values of modesty, abstinence, and no pre-marital sex. Meanwhile, actively seeking information may be considered a shameful act.

Social Sciences

Autism Spectrum Disorder: Treatment Complications and Outcomes Facing San Antonio Families

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Contreras, Alexandra; University of the Incarnate Word

Cisneros, Cordelia; University of the Incarnate Word

Mission Driven Research

This study reflects the mission and the core values of the university in many respects. Although there are many celebrations in the Autism Spectrum Disorder (ASD) community, our research educates those who may be unaware of the various struggles not only by the children affected this disorder, but explaining the outcomes experienced by the families as well. Relying on the voices of the families with ASD provides insight into what our local community is facing in everyday-life. We have joined a league of researchers who, only within recent years, have prioritized using innovative research methods to find truth that positively impacts the whole community. All healthcare industries benefit from research that highlights the importance of social justice, while valuing dignified support and treatment of God's children. We aspire to create dialogue and provide education, as well as create a larger pool of advocacy, not only for ASD, but mental health in general.

Project Abstract

Purpose: The current project aims to highlight experiences and challenges facing families of children with Autism Spectrum Disorder (ASD). The guiding research questions were 1) "What is the family experience of finding treatments for children diagnosed with ASD?" and 2) "How does ASD affect family outcomes?" It was expected that parents will explain events following the process of receiving an ASD diagnosis, which will include finding specialists and treatments. They will also explain outcomes facing the family, such as finding childcare and appropriate schooling.

Rationale and Significance: Parents of children with ASD often struggle with basic care, such as finding a trusted doctor, enrolling children in a typical daycare/school, or having a regular babysitter equipped to address special needs (Walsh, Mulder, & Tudor, 2013). These challenges affect parents' physical and mental health (van Tongerloo et al., 2015) and the care given to their children. Parents often take drastic actions, such leaving a career to be a full-time parent (Zablotsky et al., 2014) or experiencing

marital challenges (Papp & Hartley, 2019). With a multitude of new cases of ASD, the health care system is struggling to keep up, and the wait times for children to see a doctor can take over a year (Zablotsky et al., 2014). Some families are in crisis will visit a doctor who may not be qualified, leaving them unhappy with their medical care (Wiley, Gustafson, & Rozniak, 2013).

Methodology: An anonymous survey was posted to a Facebook support group of parents of children with ASD. Forty participants answered six questions about their experiences regarding therapy, childcare, and siblings. The mean age of the child with ASD was 9.1 years old and the mean age of diagnosis was 3.7 years old. Thirty parents (75%) had at least one more child, and twelve (30%) of the siblings had a disability.

Findings: Four themes were found in the parent responses: Seeking Care (includes therapy/treatment, insurance, and resources), School Outcomes, Childcare, and Family Outcomes (parent or sibling). In terms of "Seeking Care," being on a doctor's waiting list for a substantial time was common. If they did find a doctor, getting access was often a problem because of insurance coverage. "School" and "Childcare" themes had evidence that the risk mistreatment of kids with ASD is common; parents try to be extra careful with choosing caretakers and school campuses. The everyday stress of thinking and acting on behalf of the child contributes strongly to "Family Outcomes." For example, parents without respite available were likely to express dramatic life changes, such as getting a divorce or having to leave his/her career to stay with the child. The full analysis will demonstrate that forty parents of children with ASD had a similar story to tell but being able to describe the experiences is only the first step to building on interventions that gave parents hope and, at times, a new way of living.

Service Learning

What is it like to be an immigrant or refugee? Building Solidarity in the Human Family

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Carrasco, Sadie; University of the Incarnate Word

Marrufo, Maria; University of the Incarnate Word

Melero, Camila; University of the Incarnate Word

Mission Driven Research

Our research allows us to gain an understanding of the struggles that immigrants and refugees suffer through just to live. In turn, we are able to take our knowledge and educate our community helping them to become more enlightened citizens with a better understanding of the world, as well as each other. Not only this, but we encourage life long learning about immigration and refugees, and hope to inspire action against prejudices and preconceived notions of hate. Through this research we hope to find justice for immigrants and create a world filled with compassion and peace.

Proposal Narrative

Service learning to research, share information, and advocate for immigrants, especially immigrant children. The universal declaration of human rights states that people in danger have the right to migrate. Both ethical and religious traditions hold human life and dignity as precious.

Students in the Social Justice Leadership class, in the Ettlting Center for Civic Leadership and Sustainability, and members of the UIW community. Began to learn about immigration through a documentary titled, "Dying to Live". We then listened to an immigration attorney named Hope Frye in which she discussed her connections to the immigrant families and what we could do as a class, campus and community to reach out and help. We have also read various documents that discussed immigration and how to create peace between ourselves and others, despite our backgrounds. This knowledge gave us the information we needed to plan a trip to McAllen, Texas to bear witness to the families being held in the detention center there and gather hundreds of pounds of supplies for those there who needed them. We also watched a play reenacting the lives and the thoughts of immigrants and those intertwined to their stories, both

sides discussing the matters as they believed them to be unfolded. In addition to those events, we visited a display being held by Doctors Without Borders talking about the journeys and the struggles that immigrants and refugees have to go through just to live.

Throughout this whole process, we also collected many donations and books for the refugees and immigrants, and are continuing to assist, advocate and educate.

We are finding that students and in turn the whole community are being better informed. We are working together to inform everyone that we can about the struggles of refugees and the hardships of those immigrating, as we gain knowledge to fight any previous prejudices that any of us might have.

Service Learning

Cross-Disciplinary Service Learning Projects

Edmond, Tracie, PhD; University of the Incarnate Word

Driskill, Trish, PhD; University of the Incarnate Word

Mission Driven Research

It is a service learning project, where the students use their skills and lessons learned in the classroom to help a community partner.

Proposal Narrative

Each of the UIW disciplines have their unique strengths and challenges that students within those disciplines need to overcome. It is interesting how the strengths of one discipline is a weakness in another. When the disciplines work together, we maximize strengths and minimize weaknesses within each discipline concentration.

The Amazing Race to Serve and the SOAR service learning events are service project that incorporated the HEB School of Business, The Dreeben School of Education and the School of Media and Design.

The lessons from this joint project is truly inspiring as together we were able to use the skillsets and strengths of the students in each discipline to make a difference in the lives of over 300 children.

Service Learning

The importance of patient education in a Mission trip

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Majcher, Carolyn, OD, FAAO;University of the Incarnate Word

Wong-Powell, Jeannette, OD, FAAO;University of the Incarnate Word

Mission Driven Research

The service described in this presentation reflects true caring and concern for the well-being of the community, specially those patients who are most in need as this maybe the only exposure they may have to medical education regarding their own health.

Proposal Narrative

Mission trips planned for health care include a variety of health professionals. The limited time available is dedicated to medically examine, diagnose and treat the patient and the patient education component is often minimized or even omitted due to a variety of circumstances such as language barrier and time constraint.

In the last few years, the UIW School of Optometry (UIWRSO) participates in a mission trip to Xocempich in Yucatan (Mexico) that was initiated over twenty years ago by an Ophthalmology surgical team from Indiana. The goal of the trip was to provide surgical vision care to pre-selected group of underserved patients screened for selected operable ocular diseases.

Initially the group was composed of a surgical team: an ophthalmologist, an ophthalmology resident and 2 nurses as well as an optometric team: an UIWRSO faculty member and two 4th year UIWRSO optometric interns. Once the optometric team evaluated the patients, surgical team would operate and have a joined follow-up evaluation with the optometric team.

Two years ago, a patient educator, a UIWRSO faculty member fluent in Spanish, was incorporated and other goals were included, such as pre and post-surgery patient education. The presence of the educator increased the interaction of the surgical team as well as the optometric team with the patient. The patient educator was also more involved in the examination process and had a close interaction with the optometric interns to improve diagnosis and prioritization of surgeries as well as to tailor post-operative care. The

multidisciplinary interaction expanded the learning environment beyond the classroom.

During the team daily reflections, the importance of the patient education was highlighted as a key component for the success of the patient treatment. In this presentation we will discuss the importance of patient education during mission trips in a health care setting where ethical issues may arise, patient dignity may be overlooked and knowledge of the disease and treatment compliance become key to positive patient outcomes.

Service Learning

Roots Serving the City, Branches Serving the World: UIW and the San Antonio Tricentennial

Kirk, Sr. Martha Ann, Th.D.; University of the Incarnate Word

Mission Driven Research

The UIW Mission statement notes "The first Sisters of Charity of the Incarnate Word, three young French women motivated by the love of God and their recognition of God's presence in each person, came to San Antonio in 1869 to minister to the sick and the poor. Their spirit of Christian service is perpetuated in the University of the Incarnate Word primarily through teaching and scholarship, encompassing research and artistic expression." This projects indicates how the UIW Community today has carried on this service in the celebration of the San Antonio Tricentennial.

Proposal Narrative

As San Antonio celebrated its Tricentennial in 2018, the Sisters of Charity of the Incarnate Word Sisters had been a part of that history for 149 years opening the first hospital, carrying for orphans, the uneducated, and others in response to civic needs.

During 2018, many UIW faculty and student research, educational, and service projects focused on the Tricentennial and carrying forward the spirit of our founders. There was service related to sustainability, education, participation in inter-university and inter-medical schools conferences. The Charter for Compassion movement in the city was initiated at UIW with social justice and service projects which have led to the City Council affirmation as a City of Compassion, modeling civic engagement.

Over a dozen UIW classes including literature, languages, history, computer, communication arts, psychology, and religious studies, did service learning or research related to the Tricentennial. For example, Dr. Darlene Carbajal's graduate Communication Arts class, "Convergent Media" did multiple service learning projects in support of the Tricentennial. They developed films, social media, and print media for different groups, from the puppet films to attract children, to UIW students, to the general public. The author was in dialogue with them about communication and she authored or was the main contributor to six articles related to the Tricentennial in the San Antonio Express-

News, Today's Catholic, and Global Sisters Report and six in UIW publications, the Logos and the UIW web front series.

Historical tours called "Following Footprints of Service" which included the IW Heritage Center, Mission Espada and Mission Concepcion, and San Fernando Cathedral attracted many people and invited them to make new paths of service. A photo exhibit in the Kelson Fine Arts Center shared more images of service.

"Mi Casa Es Su Casa," a festival was held on April 15, 2018 with UIW, Sisters, CHRISTUS Health, and Headwaters partnering in welcoming the city. Remembering that early Incarnate Word Sisters came from over 20 cultures and that over 70 cultures are represented on the campus today, in exhibits, performances, children activities, and sung prayer, there was a rich variety of European, Middle Eastern, African, Latin American, Asian, and American Indian representation.

Within the day there were over 250 performers from Matachines, five to seventy-five years old, to UIW Asian dancers, to children doing Turkish dance, to high school singers, to the Wind Ensemble sharing SA composers, to Irish singers, dance schools, the Interfaith ensemble, and Catholic schools' actors and musicians.

As well as the performers, over 700 people attended prayer, entertainment, and the educational events. A main event was part of the SA300 Higher Education series, "Origins—Native Peoples, Spaniards, Early Education in San Antonio" and this began at the Blue Hole with a Native American ceremony.

Close to a 100 volunteers, both from our campus and four other schools, were involved in welcoming; leading people to see history, art, and culture; sharing health screenings; entertaining children; setting up and cleaning up. The festival served our city and shed light on our history of compassionate service.

Service Learning

Predictors of Emotional Reactions to Proposed Service-Learning Project: Part II

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Gonzalez, Silke N.; University of the Incarnate Word

Meyer, Sara R.; University of the Incarnate Word

Mission Driven Research

This project reflects the mission and core values of the university as it further investigates our students' reactions to service-learning, which relates to several UIW values. While the objective of service-learning projects is to contribute to the development of concerned and enlightened citizens, a key aim of the mission of UIW (Education; in the context of Service and Faith), the concern for how our students are responding to such projects is also aligned with the mission. Asking the question of how our students are reacting to this type of learning experience is consistent with the core value of Truth. The assessment of service-learning as a pedagogical practice reflects our concern that these are positive experiences for our students, so any adjustments can be made to make service-learning beneficial to all involved.

Proposal Narrative

This study expands on a previous project investigating potential predictors of student receptiveness to service-learning. Although this project was presented previously, new data nearly triple the number of participants included in analyses, providing more power to identify significant predictors. The purpose of this project is to investigate students' feelings about service-learning, including examination of potential resistance to service-learning.

While our objective as faculty administrators of service-learning projects is to contribute to the development of concerned and enlightened citizens, it is important for us to pay attention to students' beliefs about the experience as well, in order to make it a positive experience for all involved.

Service-learning is an experiential learning strategy that is advocated by both religiously-affiliated (e.g., DePaul, Loyola, Villanova, the University of the Incarnate Word) and public (e.g., Montana State University, the University of Texas at San Antonio, Binghamton University) institutions. Although the literature on the efficacy of service-learning is growing (e.g., Reinders & Youniss, 2009; Celio, Durlak, & Dymnicki, 2011; Weiler et al., 2013; Desmond, Stahl, & Graham, 2011), we need to know more about whether there are certain types of students who are more (or less) receptive to service-learning.

Three sections of a Social Psychology course requiring service-learning will be surveyed for this study ($n \approx 60$). After the project is explained, students are asked to indicate their reactions to both the overall service-learning project (OSLP) and the Service Component of the project, specifically (SC) in a modified version of the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). Personality factors are assessed with the BFI-10 (Rammstedt & John, 2008), values related to moral concerns with the Moral Foundations Questionnaire-30 (Graham, Haidt, & Nosek, 2008), and various demographic variables are assessed (e.g., age, ethnicity, religious affiliation, conservatism/liberalism).

As in the previous analysis of the smaller sample ($n = 22$), stepwise multiple regression will be performed assessing whether any of the BFI characteristics, MFQ values, and/or demographic variables will significantly predict PANAS scores for both the Overall Service-learning Project and the Service Component alone. We expect that the larger sample ($n \approx 60$) will provide more power to detect significant predictors of students' affective reactions to their prospective service-learning project. Of particular interest is whether self-reported ethnicity will still predict more positive affect toward the OSLP and the SC for Hispanics than for Caucasians, as it did in the smaller sample, and whether a greater tendency toward liberalism vs. conservatism will still predict more positive affect toward the SC only.

Additionally, we are interested in whether endorsement of the MFQ subscales and personality characteristics will be related to students' expectations. As we move toward increasing integration of service-learning into college courses, students' expectations about this type of curricular experience becomes an important consideration, both in determining whether they are favorably received and in determining how to best approach their presentation to potentially reticent students.

Service Learning

Creating clothing with style for teens with special needs

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Ingram, Cepresia; University of the Incarnate Word

O'Brien, Emily; University of the Incarnate Word

Ramirez, Bryan; University of the Incarnate Word

Tornel, Cecilia; University of the Incarnate Word

Mission Driven Research

To respect the dignity of each human being and to foster the development of the whole person are the goals of the UIW Fashion students in their project with students from the Children's Rehabilitation Institute (CRIT). UIW students will research adaptations to clothing for special needs children. While designing functional garments, each student will meet and interact with their client to create a fashionable garment that can be worn with pride. They reflected on the challenges facing young men and women who live with special needs.

Students learned about the CRIT model of care which concentrates on the physical, psychological, spiritual and social needs of the individual. The typical child has needs due to conditions such as neuromuscular diseases, spinal cord injury and Spina bifida, Cerebral palsy, Downs syndrome, Autism, vision/ hearing impairment, or limb loss. The goal at CRIT is to empower patients to achieve their full potential with inclusion into society (critusa.org, 2018).

The garments created by the UIW students reinforced the dignity of each human being and gave them a sense of pride in helping others.

Proposal Narrative

The purpose is to provide clothing options to individuals with special needs who want to be fashionable, comfortable, and confident in their daily dress. Clothes consciousness is a desire common to all young adults and more so among teens. However, young teens that have special needs due to Cerebral palsy, Downs syndrome, or Autism have difficulty finding stylish garments that they can wear if they are wheelchair bound, have a feeding tube, or have missing limbs. UIW Fashion students decided to design fashionable clothing for teen patients at the Children's Rehabilitation Institute (CRIT) after working with four patients on a sweatshirt design project.

UIW Fashion students became concerned for the well-being of teenage patients at CRIT after participating in a community project in the fall of 2018. The project involved embellishing sweatshirts for the students'

appearance on a float for the San Antonio Holiday River Festival. Students encountered several challenges due to the special needs of the clients at CRIT. The garments needed to be easy to pull over their heads, loose fitting in the torso, and comfortable for a male or female. This project gave them an opportunity to reflect on the special type of clothing needed for individuals who are wheelchair bound with limited range of motion.

Retailers have taken notice and are manufacturing "special needs" clothing for all ages. According to founder of Easy Access Clothing, Sandy Zeichner (2006), and the United States Census Bureau, "19% of Americans have some level of disability". She has designed "onesie" garments and pants with side zippers. Leading retailers such as Target, Tommy Hilfiger, SpecialKids.Company, Zappos, Nike, and JC Penny have created separate clothing lines that cater to special needs individuals. (Matchar, 2018).

UIW Students visited CRIT to understand the type of rehabilitation provided at the Center. They observed the types of wheelchairs, prosthetics, and braces that the patients used. Interviews were conducted by UIW students with the patients, their counselors and parents. Such questions included their preferred color, type clothing they liked to wear, and the most difficult issue faced in dressing themselves.

Students will research designers and companies that are creating clothing with special accommodations. They will investigate the use of magnetic buttons, velcro closures at inseams, paper bag style waistbands, cotton bottoms with drawstring casings, and raglan sleeve tops with side openings. After creating a test garment, they will try it on their client, make alterations and construct the final garment. Students will reflect on challenges facing young men and women who live with special needs and the meaning of this project on their lives.

Service Learning

Community Corrections Service Learning: Exposing Future Criminal Justice Practitioners to the Service Side of Community Corrections

Piper, Doshie, PhD ; University of the Incarnate Word

Mission Driven Research

This project reflects the universities core value of service and the institutions mission to create life long learners.

Proposal Narrative

Most if not all forms of community corrections has a community service component. Albeit, a direct sanction of community service or service as a form of restitution. For a growing number of community corrections and many more juvenile probation departments, work service requirements have become a standard part of court orders, in some cases required by policy or statute. This increases the need for criminal and juvenile justice practitioners to understand the importance of service and a tool of reintegration and not simply a justice system directive.

This presentation will explore community services as a mechanism of reintegration and means to build a sense of community in justice involved individuals through service learning reflections. The influence of community service on reintegration is studied by examining three years of service learning reflections from a Probation, Parole, and Community Corrections course comparing the students written and verbal responses to the number of elements of reintegration observed of people sentenced to community service that they working alongside of in community organizations.

Service Learning

BSN Nursing Students Service-Learning Experiences with a Vulnerable Population: Thematic Analysis

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Davila, Yvonne, MSN, RN, CNE; University of the Incarnate Word

Hook, Linda, DrPh, MSN, RN, PHNA-BC; University of the Incarnate Word

Carrisalez, Crystal, RN, MSN; University of the Incarnate Word

Mission Driven Research

Our community health service learning courses encourage our nursing students to live the mission of UIW by helping individuals in vulnerable child, adult, and older adult populations of San Antonio. Students reflect on how their service clinical experiences meet tenets of the UIW mission and follow Catholic Social Teaching principles. This review looks at the themes of our service learning course outcomes as they relate to our mission.

Nursing service- learning courses promote transformational learning experiences in the BSN student. This unique approach integrates community service with class to teach civic responsibility and strengthen communities. Also, service-learning courses introduce students to persons with health disparities and ways they can help vulnerable populations. (Stanley, 2013)

This study is a thematic analysis of five semesters of those reflections (from Spring 2016 through Spring 2018 of level three BSN nursing students.) Student reflections will be sorted into themes utilizing the student's perceptions of their experiences with each of three vulnerable populations: older adults, children, and homeless individuals in San Antonio.

Proposal Narrative

Nursing service- learning courses promote transformational learning experiences in the BSN student. This unique approach integrates community service with class to teach civic responsibility and strengthen communities. Also, service-learning courses introduce students to persons with health disparities and ways they can help vulnerable populations. (Stanley, 2013) Research has shown service learning has a positive impact on students (Knecht and Fischer, 2015). Also, service- learning courses introduce students to persons with health disparities and ways they can help vulnerable populations. Vulnerable populations in this study include homeless and underserved children, adults, and older adults.

Numerous studies support the benefits of exposing nursing students to vulnerable populations. Experience with a vulnerable population has been shown to change the BSN students' attitudes and beliefs. An understanding of the health disparities and inequities that affect this group increases nursing students' awareness regarding social responsibility, ethical concerns, and advocacy while fostering compassion for marginalized groups. (Stanley, 2013) Several other studies measured perceptions about the homeless and found that by participating in a clinical experience with this population, students reported an increase in empathy and a more positive change in attitude toward mentally ill, homeless patients. (Garner & Emory, 2018) Service learning has also been shown to increase empathy and views on social justice. These changes are significant ways to improve healthcare as research has shown that nurses negative attitudes have been identified by the homeless as a barrier to seeking care. (Jarrell, et.al, 2014). Encouraging nursing students to work with vulnerable populations helps them gain an understanding and sensitivity to the unique challenges these populations face related to health and healthcare. (Stanley, 2013)

The Health Promotion and Disease Prevention course was designated as a service-learning course in 2015; however, the participation at Haven for Hope has been ongoing since 2010. In these courses, nursing students participated in eight to 16 hours of clinical rotations at each of the following: Haven for Hope Courtyard, senior centers, schools, and child care centers. Students performed developmental screenings, foot care, immunizations, blood pressure and other health screenings. Students also performed needs assessments, followed by a health-related teaching project based on the needs of the clients.

At the end of each semester, students reflected on how their clinical experiences related to their civic responsibilities and to their future as a nurse. Reflecting on social justice is a vital part of service learning. (Brown & Schmidt, 2016) This study is a thematic analysis of five semesters of those reflections. Student reflections will be sorted into themes utilizing the student's perceptions of their experiences at each of three vulnerable populations: older adults, children, and homeless individuals in San Antonio.

Service Learning

Gun Safety Saves Lives

Velez, Jacqueline; University of the Incarnate Word

Carrasco, Sadie; University of the Incarnate Word

Casanova, Selena; University of the Incarnate Word

Navarro, Matthew; University of the Incarnate Word

Rodriguez, Christian E.; University of the Incarnate Word

Mission Driven Research

This project provides education to our community on service learning events about gun safety. In educating on safety, we hope the information provided will be educational and promote a safer environment.

Proposal Narrative

From Columbine to Sandy Hook, mass shootings plague our everyday life. Students must now carry bullet proof backpacks, teachers are being armed with guns to protect their classrooms. People need to feel safe in their homes as well outside the home. There needs to be gun safety. The laws need to change, so the streets are safer for our children because they are our future, and it is time we promote and end to gun violence. The purpose for this research is to demonstrate to people the need for gun safety. We are trying to change attitudes on our campus and in the city about why gun safety and gun safety legislation is important.

We will be utilizing information pulled from the Logos Student-Run Newspaper as well as an article from the Express News on the vigil held in honor of those who lost their lives to gun violence at Sandy Hook Elementary School. Information from Moms Demand Action will also be used in this project.

The method of this research will be in poster format. The poster will feature pictures of vigils honoring those who were victims of gun violence. Statistics of gun violence in America will be on display. Pictures of the Senator Jose Menendez educating the audience on the district, bills, laws, so people know where to go to create gun laws. There will also be pictures of Moms Demand Action at Advocacy Day, which is coming up on February 13. Pictures of Peace Day at University of the Incarnate Word will also be on display.

UIW is already witnessing changes in attitude because more people are being informed on events and

discussion about gun prevention. The more we have open discussions on topics as sensitive as this, the more knowledge there is to know on how to keep our children safe from harm.

Service Learning

Living the Mission: How UIW RSO is Saving Hundreds of People from Blindness in Mexico.

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Mission Driven Research

Constitutes a description of the process by which one of the most beloved service-learning programs at UIW Rosenberg School of Optometry school was created and how it is making our training program unique.

Proposal Narrative

From its inception, Rosenberg School of Optometry set out to be unique by being the only faith-based optometry training program in the nation.

This presentation will describe how UIW RSO is turning this characteristic into action by implementing service learning as a tool to achieve excellence in clinical training and personal growth among faculty and students.

The presentation will describe the precepts under which our yearly mission to Yucatan, Mexico was founded, its goals, implementation, technical aspects, current success, and plans for the future. Statistics of causes of blindness worldwide and how current efforts are making an impact will also be shared.

Service Learning

Medicine meets Missions: How medical mission trips develop students into good doctors

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Mission Driven Research

The medical mission trip to Yucatán, Mexico most accurately reflects the importance of self-realization, the common good, and community service in the context of faculty and students supporting each other and those around them with dignity and respect as described in the mission of the University of the Incarnate Word.

Proposal Narrative

A volunteer group from University of the Incarnate Word Rosenberg School of Optometry organized and participated in a medical mission trip to Yucatán, Mexico. The team was comprised of four optometry students, three teaching faculty and two additional volunteer surgeons from outside of the school. The goal of the mission trip was to prevent and treat blindness due to advanced cataracts, glaucoma and diabetic retinopathy in the under treated local population.

This mission project incorporated a team of experienced professionals from different clinical settings that screened approximately 70 patients everyday during the weeklong mission, a far cry from the 4-6 typically cared for each day in the school clinic. All of the patients were considered candidates for cataract surgery or diabetic laser treatments. Selecting candidates for cataract surgery presented an ethical dilemma and real life learning experience for students because appointments for surgery were extremely limited relative to the degree of need. Despite the surgeons' best efforts to efficiently perform a modified

form of modern surgery, appointments were limited to approximately 40. History of prior surgery and predicted prognosis were integrated with patient age and degree of resource to his or her community when considering selection of an ideal surgical candidate. Alternatively, those suffering from diabetic eye disease presented the challenge of gracefully coordinating what seemed to be a limitless amount of care. This necessitated on the spot decision making and creative methods of care in an often rudimentary clinical setting.

Providing care for patients suffering from diabetic eye disease and glaucoma also presented the challenge of delivering an unfortunate prognosis— the already limited vision would not likely ever become better despite care. Added to this difficulty was the challenge of eloquently delivering news to patients with a language barrier in place. Even so, the implications and emotions behind the news were universal.

All together, the medical mission trip provided a unique opportunity for students to be able to self examine what they believe to be the characteristics of a “good doctor.” Additionally, students were able to practice and incorporate their evolving views of what a “good doctor” is in real time, without the reward or threat of a letter grade influencing their perceptions and behavior. This presented a unique opportunity to consider one’s role in the medical field and community without having to follow guidelines or rubrics established by an institution. One could easily argue that there are no domestic clinical rotations that can provide an experience equivalent that that of a week long international medical mission trip in an area of great need.

Service Learning

Choose Your Own Adventure: Service Learning Project for Design Students

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Mission Driven Research

This purpose of this project is to help make students aware of issues in the fashion industry and at large. The project can be adapted to any discipline and used for service learning.

Proposal Narrative

With constant change and the evolving nature of the economy and job demands, creative problem solving is a highly valued skill for entry-level jobs in design (El Mansour & Dean, 2016; Hanc, 2018). Service-learning assignments have also been shown to positively influence other skills such as collaboration, self-efficacy, and communication (Eike, Myers, & Sturges, 2018). As part of the instructional design of an introduction to design freshmen-level course, we implemented a service-learning assignment utilizing the 20time framework introduced by Google and Kevin Brookhouser (Brookhouser, 2014).

For this project, students identify social or environmental issues related to their field, along with possible solutions to alleviate the issue. The whole class narrows down the possibilities to a few projects through divergent and convergent thinking tools. We first brainstorm as a group on possible issues and vote on the top five. They then choose their teams to work on the defined issues. As part of the project, each team creates their own action plan and grading standards. They must first clearly define the issue, create a plan of action and deliverables, develop a timeline and budget, and define how they will be graded on the project.

After three semesters of implementing the assignment, students have indicated that they are more aware of social and environmental issues related to their chosen career path, and have worked in teams using the learned creative problem-solving skills. They must work collaboratively on the project, resolve issues that arise when working in groups, and implement communication skills to present the outcome.

Student projects have ranged from denim recycling to ethical product choice awareness, to raising funds for a Veterans' association through a student design. The grading standards are currently the most difficult part of the assignment for students. For the future, we plan to provide example rubrics and grading break-downs, while still allowing student groups to have control over all aspects of the project. This particular assignment can work well for all aspects of education at all levels and within different disciplines.

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Service Learning

Identifying, Assessing, and Intervening for Human Trafficking Victims

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Mission Driven Research

The spirit of Christian service at the University of Incarnate Word encompasses teaching, scholarship, and research. This research project provides new knowledge for the South Texas community on the current identification and assessment of trafficked human beings and interventions deployed to assist the victims of trafficking. Searching to expose knowledge and truth regarding the plight of trafficked individuals and the healthcare community's efforts to intervene will highlight for the global community the status of this issue. The discovery and communication of truth enables the community to thoughtfully innovate to intervene for the common good. Students actively participated in calling emergency departments to identify emergency department leaders and to assist in the collection of data, as well as participating in planning and implementing the research project.

Proposal Narrative

Human trafficking is the trade of humans for the purpose of forced labor, sexual slavery, or commercial sexual exploitation for the trafficker or others. Human trafficking is estimated to involve about 40.3 million victims, with 25% of them being children. The purpose of this study was to identify and describe the current strategies for identification, assessment, and intervention for human trafficking victims in the emergency centers of 47 South Texas counties. The intent was to determine if emergency centers have a standard protocol to identify victims, methods of assisting victims, and whether these methods have been effective. Methods: For this study, emergency centers in five South Texas trauma service areas were selected as the setting for this descriptive research study. The 47 counties in these 5 South Texas trauma service areas include a mixture of urban, suburban, and rural areas. Within these 47 counties, there are 99 emergency centers. The emergency centers in the South Texas regions

are considered to have a high potential for trafficking because of the close proximity to the U.S.-Mexico border. A descriptive survey design was used to collect the information to identify current practices. The study used a brief survey of 23 questions developed by the nurse researchers based on a review of the literature and expertise with emergency department processes and care. The survey focused on the type of emergency department (freestanding vs hospital-based), providers, and clinical staff; methods used to screen adult and child human trafficking victims; results including number of positive screens, characteristics of individuals with positive screens, strategies helpful to identify human trafficking victims, and the actions taken following identification. IRB approval was obtained prior to deploying the survey. The survey was deployed using a sequential set of strategies including an online survey tool, emailed survey, and phone survey. Each sequential data collection method was followed by two reminders in the same format. Results: Surveys were completed by 26 of the 99 Emergency Centers in South Texas for a return rate of 26.2%. Of the 26 emergency centers responding, 9 (34.6%) stated that they formally screen adults and 9 (34.6%) stated that they formally screen children to identify human trafficking victims, however only 1 emergency center uses a tool to specifically screen victims of human trafficking. The remainder of the emergency centers stated that patients were not screened to identify whether they were a victim of human trafficking. The emergency centers reported that no adult victims of human trafficking were identified in 2017, and one emergency center reported that 10 child victims of human trafficking were identified in 2017. Conclusion: The identification of human trafficking victims may be missed when there is no standardization of screening. Emergency Center Nurses are positioned to identify and intervene for human trafficking victims. It is recommended that emergency center healthcare professionals be educated regarding human trafficking victim assessment and formal standardized screening for human trafficking be implemented.

Service Learning

Academic-Practice Partnership to Improve Nursing and Patient Outcomes in the Community

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Mission Driven Research

Aligning with the UIW Mission of Christian service, this partnership aspired to extend teaching and scholarship to improve nursing and patient outcomes in the community served by the University. While a partnership benefits both partners, the uniqueness of this vision was to truly focus on improving the service provided by nurses in the community with enhancing the clinical experience of students being the secondary focus. The spirit of Christian service and social justice at the University of Incarnate Word encompasses teaching, scholarship, and research. This project provided new knowledge and skills for nurses at the hospital and improved patient outcomes. Graduate students participated in improving the nursing practice and quality of patient care at Methodist Specialty & Transplant Hospital through Clinical Nurse Leader/Clinical Nurse Specialist projects and Doctor of Nursing Practice Projects.

Proposal Narrative

The partnership with Methodist Specialty & Transplant Hospital was envisioned in 2013 and initiated with a contract in 2014. The written contract elaborated the expectations of both institutions and defined the basis for the collaboration – building an exceptional nursing practice environment. The hospital partner is a 250-bed tertiary care hospital focused on serving severely compromised patients, primarily recipients of transplants, in a high acuity setting with quality care. The partnership has involved the work of 10 nursing faculty in varying roles since its inception. The partnership was designed to first attain hospital nursing's ownership of nursing practice through the implementation of evidence-

based practice (EBP) and second to elevate hospital nursing through a well-developed nursing research program. Additional goals were added across the 6-year partnership with growth focused on building an exceptional clinical environment for patient care, student experiences, and scholarship. The first projects executed by the partnership involved EBP. Starting with recognizing a high rate of catheter-acquired urinary tract infections (CAUTI), a hospital nursing team was formed, educated, and coached to analyze the research for evidence of best-practices to reduce this hospital-acquired infection. An evidence-based protocol was developed by the CAUTI Team, the Team educated the interdisciplinary staff in the practices required by each discipline to improve patient outcomes, and the CAUTI rate was lowered by 80%. Following the successful sustainment of this first protocol, a new team was mentored through the process to reduce central line-acquired blood stream infections (CLABSI). Following implementation of a CLABSI protocol, the number of CLABSIs reduced to zero. Both of these successful EBP protocols were deployed system-wide after the successful implementation at the partner hospital. After completing two evidence-based practice protocols, the UIW faculty involved in the project introduced and coached teams of hospital nurses to conduct research. A kidney transplant research team, a liver transplant research team, and a nurse retention team were formed. Each team designed, implemented, and evaluated a minimum of 2 research projects. Six research studies have been completed. Three research studies are still in progress. The partnership work also delved into factors impacting the retention of nurses. A study was conducted of the satisfiers/dissatisfiers of the hospital's registered nurses and provided guidance to hospital nursing leadership on actions that should be taken to improve the nursing work environment and retain the registered nurses. To this date, the academic-practice partnership's positive results have resulted in 15 presentations (3 international, 6 national, 2 state/regional, and 4 local). Five publications have been published/accepted for publication and one manuscript is pending acceptance. The partnership has received three awards including the prestigious Exemplary Academic-Practice Partnership from the American Association of Colleges of Nursing and the American Organization of Nurse Executives. The partnership is now in its 6th year.



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