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"Advancing Together." 15th Annual Research Week: Event Proceedings

University of the Incarnate Word

Research Week

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15TH ANNUAL

Research Week Proceedings

University of the Incarnate Word | April 4-7, 2022

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RESEARCH &
GRADUATE STUDIES

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Poster Presentations

College Humanities, Arts, and Social Sciences

Back to the Future: Student Feedback on the Immediate Transition to Online Asynchronous Courses

Rachel Walker

The purpose of this study was to obtain student feedback regarding online asynchronous courses created during the COVID pandemic that followed the Quality Matters template. In Spring 2020 I completed the Quality Matters (QM) "Applying the QM Rubric" Certified Course. I created courses using Quality Matters during the COVID pandemic in which all courses were online for the 2020-2021 academic year on a learning management system (LMS).

With this type of change in the instructional method it was important to obtain student feedback. Previous research supports the use of student feedback when making this type of transition (Espasa & Meneses, 2010; Roy & Covelli, 2021; Sadaf, Martin, & Alhgrim-Delzell, 2019). The feedback could provide the instructor tools for creating or altering online courses to assist in student learning and satisfaction.

Community Service, Student Engagement, and Experiential Learning on a Habitat for Humanity Building Project

Judy Ruvuna

The Interior Design Construction and Details service-learning course looks beyond building materials and structures and considers the human condition and context in terms of housing. Consideration is given to communities that lack access to affordable housing. The students in this service-learning course received an opportunity to serve the community and make a difference by volunteering to help build affordable homes for low-income families with Habitat for Humanity.

Habitat for Humanity is a nonprofit organization that partners with low-income families to help them build decent, affordable homes. It is a global organization powered by volunteers who choose to make a difference for families in need. Impact research done by Habitat for Humanity has shown that the families that live in Habitat for Humanity communities often break the cycle of poverty and have a better quality of life. In addition, there is evidence that Habitat homeowners' children do better in school and have a higher probability of attending college.

Developing Commitment to Fair Trade, ADA, and Sustainability

Diana Allison, Ph.D., ASID, School of Media and Design [1]

As students learn to unite behind the United Nations (UN) Sustainable Development Goals, they serve humanity, learning to think and act for the common good and for the benefit of future generations. Through research, students become more involved in "engaged scholarship," and find information that can help others reach their own goals. To bring awareness into a sophomore Space Planning studio and the importance of social justice, fair trade, and sustainability, while adhering also to interior design mandated ADA regulations for public spaces, two United Nations goals were addressed. Students were asked to consider their impact as interior designers using Goal 8: promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all; and Goal 12: Ensure sustainable consumption and production patterns.

The project involved designing a coffee shop for a mythical owner who is passionate about sustainability and fair trade. Before design could begin, students were required to research fair trade, sustainability, and ADA requirements. Inspired by another instructor's use of "Coffee Talks" to bring awareness of fair trade, this concept was incorporated into the course and stimulated discussion of the topics. Students discussed their understanding of fair trade and sustainability and looked at how interior design can support and enhance both.

The 17 UN Sustainable Development Goals were discussed both professionally and individually. Videos of other nations' view of United States consumption and the positive fiscal impact of investing in sustainable and fair-trade businesses were presented. Students learned about fair trade in practice and its ability to alleviate poverty and increase the health of those in a cooperative through a Zoom discussion with one of the founders of a coffee cooperative in Chiapas, Mexico. Discussions in class centered around designing for sustainable activities. Experiential learning occurred through a visit to a local coffee shop where they learned more about planning for social distancing and meeting ADA guidelines. As a part of this activity, students took turns using wheelchairs to navigate the UIW campus.

Student reflections on the studio and what they learned about fair trade, sustainability, and inclusivity created various levels of impact. Several students have changed their coffee buying habits by only purchasing fair trade beans and have subsequently encouraged their parents and relatives to do the same. Many have become more sensitive about the interplay of trash and sustainability, as well as and more cognizant of the physical environment's limitations. They also have become more educated consumers and are concerned about where their clothing and other consumables products originate.

The group's design of the coffee shop included consideration of how the décor would tell the story of fair trade and more deeply inform the consumer. Students made interior material selections that were environmentally friendly and were either reclaimed or sustainable. The majority also spoke about other sustainable systems the coffee shop owner may use, such as washable instead of disposable plates and utensils. Another student has started working for a company that believes in fair trade products for what they make and sell. This has made a difference in how UIW students think and design, and where they decide to volunteer, work, and spend money.

[1] University of the Incarnate Word

Empowering Girls! Collective Design for Community: A Case Study of Mini GEMS Branding

Doris Palmeros

Goal
In the Business of Design course (Communication Arts), students were placed in groups and challenged to design a branding system for a UIW non-profit organization Mini GEMS (Girls in Engineering, Math, and Science). This design team project was developed to provide students with experience in service-learning through a collaborative effort with a non-profit and enable them to provide a service through their learned skills.

Brief
The University of the Incarnate Word (UIW) Business of Design class worked with Mini GEMS to produce essential branding needed to help with promotion, fundraising, and recruitment for the organization. The student design teams developed a strategic branding system as well as a campaign to empower young girls and help them get excited and motivated about the upcoming summer school program. This poster will highlight the branding system and collateral that Mini GEMS required, including a website and Power Point presentation decks for fundraising purposes.

Process
Mini GEMS is a non-profit program that promotes education in the STEAM (Science, Technology, Engineering, the Arts and Mathematics) fields for young girls in Title 1 middle schools of San Antonio, Texas. The focus is to empower girls in male-dominated industries. Students worked with Mini GEMS to rebrand the organization and help formulate their story. The goal of the design team was to create a cohesive branding system and campaign that would represent girl empowerment, gain the trust of the families involved, and motivate investors. It would help legitimize Mini GEMS as an established and valuable organization for investors. The full campaign included logo, tagline, marketing collateral, and promotional product. Project phases included initial meetings with the client to understand and research the objective and to formulate a strategy. Final designs and presentation were given to the client. Challenges in the project included the bilingual component for the Anglo/Hispanic market and the diverse target audience of underrepresented families.

Effectiveness
Outcomes and reflective summaries reveal that most students felt challenged by working with a real-world client and in a large project team. Students realized they could use the power of design to help shape ideas and create positive impact with non-profits; they themselves felt empowered. Mini GEMS is rebranding their organization and involving winning team members in rolling out the re-brand across multiple platforms.

Foreign Language Anxiety and Cooperative Learning: A Pilot Study

Michael Tallon

The purpose of this pilot study was to examine whether using cooperative learning can help reduce the foreign language anxiety (FLA) levels in students in a first-semester Spanish class. Students who experience FLA typically do not learn as much and do not do as well in language classes as those students who do not experience FLA. One feasible way to help reduce anxiety is to use cooperative learning in the classroom. Previous research has shown that cooperative learning can result in greater efforts to achieve, more positive relationships among students, and greater psychological health. The research question addressed in the study was: Can the use of cooperative learning help reduce the anxiety levels of students in a first-semester Spanish class? The hypothesis was that the anxiety level for the experimental group would be lower at the end of the semester than the anxiety level for the control group.

Participants for this study came from two first-semester Spanish classes: an experimental group (n=11) and a control group (n=16). In the experimental group, beginning with the second chapter, students participated in two cooperative learning activities per chapter throughout the semester; students in the control group participated in regular group activities. All participants completed the Foreign Language Classroom Anxiety Scale (FLCAS) (Horwitz, Horwitz & Cope 1986) at the beginning of the semester and again at the end of the semester. Their FLCAS scores were then compared to see if their scores were lower at the end of the semester and if the scores differed in the two groups of students. Students in the experimental group also answered 4 open-ended questions on the end-of-semester questionnaire, providing some qualitative data for the study. Results showed that the FLCAS scores went down for both groups of students. However, the scores decreased more for the control group (8.2 points) than for the experimental group (3.5 points). In the qualitative data, this presentation includes sample quotes from students in the experimental group to provide a better understanding of their views about cooperative learning (i.e., to hear directly from these students about their language-learning experiences using a new approach). In general, students in the experimental group indicated that they enjoyed working in the cooperative learning groups but preferred working in the regular groups more. Most said that they were less nervous or about the same when using cooperative learning as compared to working in regular groups.

GENDER BIAS IN STUDENTS' EVALUATIONS OF PERSONALITY QUALITIES ASSOCIATED WITH EXPERT TEACHING

Stefanie Boswell, Angelina Martinez

We investigated whether words corresponding to the personality qualities associated with expert teaching appear more frequently in male or female psychology professors' positive and negative evaluations in Ratemyprofessors.com. If they do, it could indicate gender bias. Our research found that personality qualities appeared significantly more often in female professors' positive and negative evaluations. The type of bias was related to the type of evaluation: women were favored in positive but disfavored in negative evaluations. The findings are consistent with research showing that compared to male professors, female professors' evaluations depend more on whether students believe they had a positive or negative experience with their female professors.

GENDERFLUX: A SYSTEMATIC LITERATURE REVIEW AND RECOMMENDATIONS FOR FUTURE RESEARCH

Faith Hopkins

The term *genderflux gender identity* refers to gender that varies in intensity. Genderflux individuals fluctuate between gender points on the same continuum, from feeling an absence of gender to identifying with the gender they were assigned at birth. Although the diversity of transgender and gender-nonconforming identities is becoming more recognized, members of these communities continue to face hostility that is detrimental to mental health. We searched for the terms "genderflux," "gender flux," or "gender-flux" in PsycINFO and PsycARTICLES databases. We did not specify these as subject terms to maximize the number of articles that would appear in the results. Three articles were found; genderflux was not a major subject in any of them. Each article used the word "genderflux" once to designate participant demographic information. Given that we found no research specifically investigating genderflux, we provided research recommendations. We concluded that research investigating genderflux is merited.

INVESTIGATION OF THE POTENTIAL RELATIONSHIP BETWEEN NOMOPHOBIA AND ALCOHOL CONSUMPTION

Mayte Alvarado, Rachel Walker

The purpose of this study is to determine the connection between alcohol consumption and nomophobia. Nomophobia is defined as the fear of being without access to a working cell phone. The results of this study will be used to showcase any correlation between nomophobia and alcohol consumption. Currently, the condition nomophobia is under consideration for addition to the Diagnostic and Statistical Manual (DSM) of Mental Disorders. More research in this area is needed.

In a recent study that examined nomophobia, or smartphone addiction, with those at a risk of alcohol and drug abuse, (Fidanci, et. al, 2021) they did not find any significant relations between these variables.

There are several other predictable factors that may contribute to a potential relationship. Based on this previous research, we continued the investigation, measuring types of attitudes and emotions related to participants' alcohol consumption. This project was the first to investigate the comparison of nomophobia and alcohol consumption. We plan to continue the investigation.

Measuring Levels of Nomophobia About Different Types of Activity Levels

Sophie Taylor

Smartphones have many advantages; however, there are many disadvantages that come along with the use of a smartphone such as nomophobia. Nomophobia is a newer disorder that has come into existence because of the increasing popularity of smartphones over the last decade. This has led to us to be dependent on our smartphones (Goncalves, Dias, & Correia, 2020). Individuals with nomophobia may experience anxiety or discomfort because they do not have their phone on their person (Arpaci, 2020).

This study's purpose is to acquire information about the symptoms and severity of nomophobia relating to several types of activity levels. Nomophobia is a 'psychological condition when people fear being detached from mobile phone connectivity' (Bhattacharya, et al., 2019, p. 1297).

UIW participants were contacted in class, by email, or through Canvas. If interested, participants clicked a link to Qualtrics, which provided an online consent document. Participants were instructed to take the survey on an electronic device. The surveys measured several aspects which included the categories of Nomophobia; Types of Activity; and Time on Smartphone.

There was no significant difference between student-athletes and nonstudent athletes regarding nomophobia and there was a significant negative relationship between losing connectedness and activity level. Finally, there was a significant positive relationship between lack of access to information and the use and reasons for using their smartphones.

Psychology Statistics Syllabi's Consistency with Best Practice Recommendations

Vera Harris

The syllabus is the first tool to which students are introduced to help guide their learning in a course. A well-constructed syllabus presents the instructor's expectations, needed materials, and prerequisite knowledge, allowing students to assess their own preparedness for a course and projected study time. When a syllabus is utilized provides limited information, rather than being a comprehensive learning tool, it does not allow students the potential to be an effective learner inside and outside the classroom (Parkes & Harris, 2002). Given this, our study examined if psychology statistics syllabi comply with Landrum and Smith, (2007) best practice syllabus recommendations for the course. Our sample syllabi were accessed via the Society for the Teaching of Psychology, Project Syllabus, a website which contains a refined list of syllabi that may be utilized as reference for faculty.

Self-esteem, Stigma, and Mental Health Among Sexual Minorities

Arianna Villarreal, Teresa Taylor-Partridge

Purpose

This study was conducted to test the hypothesis that self-esteem and stigma are significant predictors of psychological well-being in individuals identifying as lesbian, gay, bisexual, or queer (LGBQ). This is a secondary analysis, using data from Project STRIDE which was a study on stress, identity, and mental health conducted in New York and reported between 2004 and 2005 (Meyer et al., 2018).

Rationale and Significance

With the marginalization of queer individuals, achieving positive self-worth may improve their mental health despite adversities, while stigma and other internalized attitudes can also negatively impact one's well-being. The stress associated with victimization puts sexual minorities at risk for mental health concerns including substance abuse and suicidality (Mereish et al., 2014). Vosvick and Stem (2019) studied psychological outcomes among LGBQ individuals and found that self-esteem and mindful acceptance significantly moderated the relation between stress and psychological quality of life. Coming out is a process that further promotes growth and acceptance, however, many manifest feelings of shame due to heterosexist constructs that can inhibit this process. These stigmas can be manifested inwardly as well (Johnson et al., 2013; Pistella et al., 2016). Pistella et al. (2016) found that greater incidence of coming out to family was associated with several positive outcomes, among them, lower levels of internalized sexual stigmas; this finding reinforces how such negative attitudes, or a lack thereof can affect an individual's well-being. High self-esteem may be a protective factor for LGBQ individuals while stigma may be a risk factor. We investigated the contribution that both factors make in predictions of well-being. This study used an existing dataset from Project STRIDE: Stress, Identity, and Mental Health, a three-year project in New York City investigating the effects of stress and identity in relation to sexual orientation, race/ethnicity, and gender on overall mental health (Meyer et al., 2018).

Method

The sample included adults who were recruited from across the city using a case quota sampling snowball method. The larger data set was limited to include 372 individuals identifying as lesbian, gay, bisexual, or queer. Stigma was measured with a 6-item scale assessing expectations of rejection and discrimination. The self-esteem used a 10-item scale from Rosenberg (1965), assessing a range of positive sentiments and negative self-perceptions. An 18-item scale, adapted from Ryff (1989) and Ryff & Keyes (1995) and using six subscales assessed psychological well-being. These subscales include self-acceptance, positive relations with others, autonomy, environmental mastery, purpose of life, and personal growth which assess mental health conceptions including theories of life course development.

Findings

A multiple regression analysis showed that both self-esteem and stigma are significant predictors of psychological well-being, $F(2, 369) = 206.741$, $p = .001$, $R^2 = .528$, with self- esteem ($b = 0.945$, $t = 18.883$, $p = .001$) and stigma ($b = -0.130$, $t = -3.568$, $p = .001$). These results highlight the importance of self-worth and self-perception that can potentially predict well-being outcomes. AIC (Akaike, 1973) showed that the best model includes both predictors.

Conclusion

Reflecting on the negative is crucial towards understanding the self, but the positive is something just as powerful. With the model showing self-esteem as the bigger predictor, this positive construct portrays counter the negative effects stigma can potentially have on LGBQ individuals' well-being. As the evolution of societal standards and identities become more fluid, individuals may feel more in touch with themselves when surrounded by those who accept them for who they are. Despite the stress queer individuals have been faced with, communities like this encourage empowerment, advocacy, and unity; therefore,

focusing on positive constructs may guide future research in finding coping strategies for individuals struggling with their identity to achieve a greater state of well-being.

TEXAS MINORITY-SERVING INSTITUTIONS AND THEIR FACULTY DO NOT HAVE LOWER RATINGS ON RATEMYPROFESSORS.COM

Stefanie Boswell, Angelina Martinez

This study investigated whether the following bias extends toward a higher education institution: will minority-serving institutions (MSI) have lower Ratemyprofessors.com university quality ratings than non-MSI? Additionally, it investigated if MSI professors have lower average quality ratings than their non-MSI counterparts and if university quality and average professor quality differed between types of MSI. Neither MSI, nor their faculty, had significantly lower quality ratings than their non-MSI counterparts. There was an MSI-type effect on average professor quality rating and covariate effect on university quality rating. Average professor quality rating was higher at Historically Black College and University (HBCUs) compared to Predominantly Black Institution (PBI)-Hispanic Serving Institutions (HSI) as well as HSIs (estimated marginal means: HBCU=4.12; HSI=3.88; PBI-HSI=3.61).

College of Media and Design

Educating Enlightened and Concerned Leaders Through Service-Learning: Examples from Two Communication Arts Courses

Darlene Carbajal, Theresa Coronado

Students in two Communication Arts courses engaged in service-learning projects to better understand course content and how their skills can be used to benefit the well-being of the UIW community. As a result of service learning, undergraduate and graduate students learned more about the mission of the University of the Incarnate Word and enhanced their professional multimedia skills. This presentation includes pedagogical examples from two Communication Arts courses where students applied discipline-related content and the UIW mission statement to create multimedia products for their client. Students learned that they could use personal and professional interests to meet community needs and be change agents.

Communication Arts students in the Convergent Media course created promotional materials for the Tricentennial Festival—Mi Casa es Su Casa! celebration at the University of the Incarnate Word. Promotional material for social media and for print contributed to live event attendance of 700-1,000 community members with web exposure of 3,835 total page views. Material created by students was uploaded to UIW's Twitter, Facebook, Instagram, and the university's website; it was also published in the university newspaper, the Logos.
The promotional video on UIW Facebook had 5,900 views, on YouTube 765 views, and on the Snap Chat filter 62 uses on the day of the event. Students' professional experiences included working with their client, Sr. Martha Ann Kirk; communicating with UIW's Office of Communications and Brand Marketing; creating content which followed the requirements specified in the UIW Style Guide as well as in the 300 San Antonio Logo Brand Guidelines; working with actor Jesse Borrego to create promotional material; and creating content which included messages consistent with the university's mission, the Sisters of Charity of the Incarnate Word, and Christus Health.
Students in the second course, Digital Film Production II, produced a 12-minute documentary on the history of UIW. The class teamed up with UIW professor of history, Dr. Gilberto Hinojosa, to produce this service-learning project. Students were expected to immerse themselves in the rich history of the University. To articulate this, they interviewed Sr. Martha Ann Kirk, Sr. Walter Maher, Sr. Kathleen Coughlin alongside Dr. Gilberto Hinojosa. Students gathered stock images, additional b-roll, and created graphics to produce a compelling work. The video has been shown at UIW board meetings and currently has over 1,200 views on the UIWtv YouTube channel.
In each course, students engaged in reflection through class discussion, deepening their understanding of the course content and of the service-learning experience. Each learned more about themselves and made connections between content taught in the classroom and service in the community, as well as professional opportunities. Along with the practical experience that students gained creating promotional material and producing the documentary, they developed a stronger connection to the university, becoming ambassadors of the UIW story.

To best answer the question students had to answer, "How does your research or creative work reflect the mission and core values of the university?", communication arts professors designed courses that combined learning objectives with community service to enhance multimedia skills taught in the classroom, while further teaching students how to apply the mission of the university to their own personal and professional interests and meet community needs. Through application, communication arts students developed professional skills and participated in real-world experiences that increased their understanding of service to others, encouraging them to be enlightened and engaged citizens. The core values of the UIW mission: education, truth, faith, service, and innovation emerged through these service-learning experiences.

Dreeben School of Education

CCVI Sisters: Warriors for Liberty, Justice, and Education

Rozlyn Bermea, Raquel Eichelman, Criscilla Thomas, and Joan Labay-Marquez

The foundation of the University of the Incarnate Word by the Sisters of Charity of the Incarnate Word dates to 1866. The sisters came to San Antonio in response to the call from Bishop Claude Dubuis to come and tend to the health needs of those suffering from the cholera epidemic. Their compassion and dedication led them to expand their ministry beyond that of health, and into childcare and education. The development of these education ministries led to the University of the Incarnate Word today, with 12 discrete schools throughout the United States and Mexico.

This service-learning project focuses on examining how the CCVI Congregation, through the development of the education ministry, has had an impact on social justice. Partnering with UIW's Mission and Ministry's Agapao Ministry, the goal of this project is to educate the wider community about the historic impact that the CCVI Sisters have had on those they have served as well as the impact on their lives today.

Through photovoice, three participants, all women, who are Master's and Doctoral students from the Dreeben School of Education, present the historical impact of this Congregation, in hopes to inspire the university community, specifically students, to become involved in the programs of the Agapao Ministries. Our plan is to help in promoting the programs and become involved ourselves.

Facing and Changing Gender Inequality—One Girl at a Time

Patrick Tumwine

Advocacy for young women's empowerment is a core focus of the Young Women's Global Leadership Program at the University of the Incarnate Word. Young women learn to advocate for themselves and others, share their voices, and develop the skills of compassionate future leaders for community action and integrity. However, as the world focuses on diversity, inclusion, and social justice, the unquestioned silence about cultural roles that reinforce gender inequality requires our attention. Cultural conformity as the norm continues to silence those fading voices we can now hardly hear. The fear of being the first to speak out continues to erode our own humanity, a critical aspect of our social fabric. There is a need to create a critical and safe space to question what we have taken for granted and, from there to interrogate our answers. Without confronting cultural perspectives on gendered roles, the conformity of our cultural expectations (Maractho, 2019) will overshadow the intention of One Girl at a Time. In this meta-synthesis presentation, the focus is on how the socialization of women into culturally prescriptive roles continues to narrow their equal participation in the world of work outside the domestic sphere (Njie, Manion & Bdjie, 2015). This presentation focuses on how well we can commit to making the girl-child central to our concern by questioning the essence of the gendered roles our societies have, for centuries, taken for granted as a normal way of living. The call is to redefine our advocacy position for gender equality and inclusion as we unravel the challenges embedded in socialized gender roles.

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Feik School of Pharmacy

Biotransformation of Forchlorfenuron by C. elegans

Jaclyn Moreno, Charles Moreno, MBA, Matthew Valdez, PhD, Paulo Carvalho, PhD, Ana Vallor, PhD

Synthetic cytokinin forchlorfenuron (FCF), a plant growth regulator used to stimulate fruit growth in grapes and kiwifruit, has six metabolites identified in studies with mice. By analyzing the formation of these metabolites, the purpose of this study was to evaluate the biotransformation of forchlorfenuron (FCF) using the fungi *Cunninghamella elegans* (ATCC 9245). *C. elegans* is a model organism used in the biotransformation of drugs and other xenobiotics due to its ability to mirror human metabolism. The objective of this metabolic study was to (1) establish the versatility of fungal metabolism to meet modern demands for the pharmacological synthesis of new drugs and (2) redefine methodologies for the identification and analysis of these compounds. As a result, we aim at establishing fungal metabolic studies as a valid tool in the pharmacological analysis of new drugs.

Effect of a Novel Hsp90 Inhibitor on Candida albicans Biofilm Growth and Filamentation

Raul Lechler, Christopher Pierce

Purpose

The goal of this project is to determine the effects of a novel Hsp90 inhibitor, commercially available from ChemDiv, on *Candida albicans* biofilm formation and filamentation.

Rationale and Significance

Candida albicans is a common opportunistic fungal pathogen and can cause diseases ranging from superficial infections, such as oral candidiasis, to life-threatening systemic infections. Two important virulence traits associated with these infections are the formation of biofilms on the surfaces of host tissues and implanted biomaterials, and the organism's ability to filament. Biofilm-associated infections are much harder to treat as they are more resistant to antifungal drugs and host immune defenses. *C. albicans* filamentation has been intimately linked to increased virulence in the murine model of disseminated candidiasis and the morphological transition from yeast to filamentous cells is critical for biofilm development. Thus, targeting biofilm formation and filamentation represents a viable alternative to treat *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.

Methodology

The compound, N-(4-nitrophenyl)-1-(pyridin-4-YL)-1H,2H,3H,4H-pyrrolo[1,2-A]pyrazine-2-carbothioamide, was tested against *C. albicans* biofilm growth using the microtiter plate model of biofilm formation coupled with the metabolic XTT reduction assay. Current experiments are aimed to characterize this compound's effects against various stages of biofilm formation, including early adhesion and biofilm maturation, as well as its ability to inhibit planktonic growth and filamentation.

Findings

Compound concentrations of 10 µg/ml inhibited 97 percent of biofilm formation. Furthermore, this compound inhibited fully mature pre-formed biofilms by more than 50 percent at 80 µg/ml. Overall, this study addresses the urgent need for the development of novel treatment strategies against drug-resistant *C. albicans* infections.

Direct oral anticoagulants versus warfarin in morbidly obese patients with venous thromboembolism

Haley Tierce

Purpose
To determine the efficacy and safety of direct oral anticoagulants (DOACs) in severely obese patients with venous thromboembolism (VTE) compared to warfarin.

Rationale and Significance
Current guidelines for the treatment of VTE recommend using DOACs over warfarin. However, clinical data for the safety and efficacy of DOACs in severely obese patients is limited. In fact, the International Society of Thrombosis and Haemostasis (ISTH) released a statement in 2016 suggesting DOACs should not be used in patients with a BMI > 40kg/m^2 or weight > 120kg. Additional data is needed to determine if DOACs are safe and efficacious in severely obese patients.

Methodology
This was a single-center retrospective cohort study. Patients were included if they were severely obese (BMI >40 kg/m^2 or weight >120 kg) and received a DOAC or warfarin for VTE treatment during hospitalization or an emergency department visit from January 1, 2016, to January 1, 2020. The primary endpoint was treatment failure defined as recurrent VTE within 1 year of anticoagulation initiation. Secondary endpoints included a composite of major bleeding rates and clinically relevant non major bleeding (CRNMB) rates as defined by International Society of Thrombosis and Haemostasis criteria. Dosing strategies for each agent at therapy initiation were also analyzed as a secondary endpoint.

Findings
A total of 43 patients were included in the final analysis with 20 patients in the DOAC arm (apixaban [*n*=13], rivaroxaban [*n*=7]) and 23 patients in the warfarin arm. There was no significant difference in rate of clinical failure between the DOAC and warfarin groups (10% vs 9%; $p = 0.627$). Additionally, there was no statistically significant difference in the rate of major bleeding and clinically relevant non-major bleeding in patients receiving a DOAC compared to warfarin (5% vs 26%; $p = 0.419$). Patients receiving apixaban were more likely to receive a non-recommended dose compared to rivaroxaban. In patients with a BMI > 40 kg/m^2 or weight > 120 kg, DOACs (apixaban, rivaroxaban) appear to have similar efficacy and safety compared to warfarin for VTE treatment but larger prospective studies are needed to confirm these results.

HEB School of Business Administration

Diversity in Boards of Directors and its Impact on Business Performance and Sustainability Engagement

Soheila Sadeghi

Purpose
To determine the impact that a diverse board of directors has on a company's performance and the link that this diversity has to other sustainability implementation efforts.
The main questions of this project are:

- Does the selection of the ideal board members (in terms of diversity) help improve the company's overall performance?
- Does a diverse board of directors also help improve the company's perception of overall sustainability?

Rationale and Significance
Corporations in the United States face increased pressure to improve diversity on their boards of directors and management. New legislation and diversity advocates have pushed for this change to enhance board effectiveness (Tersejen et al., 2015). Several dimensions have been studied as discrete parts of diversity, such as age, education level, tenure, ethnicity, religion, and nationality (Shehata et al., 2017; Sarhan et al., 2019; Limbasiya et al., 2019; Khatib et al., 2021).

Board diversity affects not only the financial performance of a corporation (Bin Khidmat et al. 2020) but also other areas that support sustainable growth within the organization, such as corporate governance processes (Sarhan et al., 2019), environmental performance, intellectual capital, and innovation (Khatib et al., 2021).

Ila Faye Miller School of Nursing and Health Professions

The Impact of Incorporating IPEC Competencies Among Community Health Workers and Nursing Students Participating in a Humanitarian Mission

Yvonne Davila, Linda Hook, Belinda Flores

University of the Incarnate Word (UIW) Nursing Students and South Texas Area Health Education Center (AHEC) Community Health Workers participated in "Operation Health and Wellness," a humanitarian mission serving colonia residents in Corpus Christi, Texas. The leadership team incorporated the Interprofessional Education Collaborative (IPEC) framework for nursing students and community health educators to engage and impact the population served by the mission. Incorporating IPEC competencies in higher education is considered essential to improving health outcomes.

An essential piece of equity and diversity goals is to educate undergraduate health degree students to collaborate in work. Rawlinson et al (2021) noted that incomplete training, lack of understanding roles and inadequate communication were barriers in community-orientated population-based care facilities. The Interprofessional Education Collaborative (2016) calls on educators to move beyond education silos to engage learning across disciplines. This report highlights how team science can improve patient care and outcomes. Students who learn to work together are better prepared for the necessary changes that lead to a healthier society.

The Interprofessional Education Collaboration (IPEC) competency domains include community- and population-oriented disciplines that are patient- and family-centered. The domains reflect improving populations and building on each profession's discipline-specific competencies.

The project faculty reached out to the South Coastal Area Health Education Center (AHEC) to implement a rural south Texas immersion experience. Together, both agreed that "Operation Health and Wellness," a humanitarian mission serving Colonia residents in Corpus Christi, Texas, was a best-matched experience for both agencies. The mission included multi-agencies, specifically Texas Corpus Christi A&M University, the Nueces County Commissioner, the United States Army Reserve, and Army North. The mission experience focused on hard-to-reach vulnerable populations usually without a consistent source of primary care.

UIW and South Coastal AHEC leadership adopted the IPEC model as a guiding framework to teach both the nursing student and community health worker how together, both can impact the community better than individually. The daily practice included driving together to rural sites and working at the site together to meet clients and develop 'just in time' (JIT) education as needed. Incorporating the IPEC framework had a positive effect, demonstrating that the nursing students and community health workers were quickly recognized by the clinic leadership for their daily contributions. The students learned the importance of doing trivial things that have an influence on people's lives. At the end of the experience, the community health worker and nursing students spoke about the importance of how their practice affects peoples' lives. Every day of the mission, the students saw small health interventions that changed the lives of the individual.

This presentation will review IPEC competencies and explain the match between South Coastal Area Health Education Center, Operation Health and Wellness, and UIW Nursing, incorporating service-learning concepts, population health inequalities, and interprofessional education and practice competencies across the disciplines.

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Rewriting the Script: A Pre-Health Education Approach for Learning with and Beside LGBTQ+ Community

Shandra Esparza, Inci Trout

This presentation focuses on using a participatory data visualization method – Rewriting the Script. In an undergraduate Pre-Professional Cultural Issues in Healthcare course, LGBTQ+ community members and students came together to have critical conversations on making healthcare more equitable for the community. In this approach, community members shared their stories of poor treatment in the healthcare system, and then symbolically, with students, rewrote the script to create a positive outcome which culminated in students developing visuals inspired by the stories. Students used these visuals to spark conversations with individuals in their circles on the issues that LGBTQ+ community members raised. At the end of the process, students wrote reflection papers on their experiences and created self-commitments as future healthcare practitioners. Using a qualitative approach, we analyzed the papers. This resulted in two categories of student commitments: personal and practice-oriented commitments. In the presentation, we will unpack these commitments in more detail. We share the promise of this approach for professional health education and how we might take it further as we try to learn with and beside community members in improving health outcomes and increasing health equity.

School of Mathematics, Science and Engineering

A MODIFIED EFFICIENT METHOD FOR SYNTHESIZING BI-ARYALATED ACYL UREA AND ACYL THIOUREAS

Rajesh Thapa, Rafael Flores

After troubleshooting several synthetic routes for urea derivatives, a series of *N*-acyl ureas and *N*-acyl thioureas were synthesized efficiently in high yields (70-90%). The direct reaction of phenyl carbamates with various amines was the most efficient, practical, and convenient method for synthesizing such urea compounds. This method tolerates a wide variety of amines and carbamates under mild reaction conditions. All products obtained were purified and fully characterized by spectroscopy methods (NMR, HPL, Mass).

Chemical Synthesis Followed by Monolayer Covalent Attachment on Mica Surface

Natalie De La Cerda

Surface modifications and synthesis have found wide applications in chemistry, biology, medicine, automotive, etc. Surface modification is important for attaching biomolecules and other chemicals to the surface via covalent linkage or by adsorption. This allows functional groups present in biomolecules to react with the functional groups on the surfaces. Recent surface characterization instruments are expensive, sophisticated, and not easily accessible in all undergraduate institutions. This study was set up to demonstrate an easy surface modification procedure in which Fourier Transform Infrared Spectroscopy (FTIR) was used to characterize different functionalities. Because the FTIR is a common and widely used instrument in the undergraduate lab, surface chemistry does not require any type of chromatography and it needs little labor. It requires minimal expense and is also safe to operate at all levels of expertise.

This project consisted of two parts, Organic Synthesis and Surface modifications. Each synthesized compound in this project was extracted and purified using various methods such as TLC (Thin-Layer Chromatography) tests, column chromatography followed by characterization using FTIR, and Nuclear Magnetic Resonance (NMR). Using the synthesized compounds, the experiment then proceeds to surface modification, where there is an important attachment of the synthesized compounds to the surface via covalent bonding. The usage of recent surface characterization instruments, such as Scanning Electron Microscopes (SEM) and Atomic Force Microscopes (AFM) are often expensive, sophisticated, and not accessible in all undergraduate institutions. This experiment demonstrates an uncomplicated surface modification procedure in which Fourier Transform Infrared Spectroscopy (FTIR) is utilized to characterize various functionalities.

Design and Development of an Integrated Multi-Sensor Remote System for Real-Time Indoor Air Quality Monitoring

Jose Chavez

The prototype described in this abstract is the result of collaborative development between Engineering and Computer Information System students at the University of the Incarnate Word as part of the Fall 2021 Senior Capstone.

Research has found a direct correlation between a room, occupancy, temperature, humidity, and CO2 levels that can increase the risk of respiratory illnesses spreading through cold, dry air. This project was designed to help mitigate risk of viral infection upon entering a monitored space by assisting users in making informed decisions about the room and indoor air quality. To properly inform the public of these conditions, we have developed a multi-sensor system that monitors the previously stated aspects of the room and communicates the collected data to the user via a website display. Additionally, it acquaints personnel in charge of the enclosed space to adjust the room, conditions and make viral propagation less likely.

The multi-sensor system is composed of various sensors programmed using Arduino, the data of which is then collected by a Raspberry Pi system locally hosting the files for the website user display. Using information based upon current safety guidelines, the website will then use current data to inform the user whether the current conditions are unsafe, safe, or should be visited with caution via an onsite indicator. Masks and other safety precautions may not always be available, but this system will allow those who use its features to take steps toward better protecting themselves, in their day to day lives, from airborne respiratory illnesses by knowing the possible dangers of the environment they are entering.

Implementation of a Three-Phase Writing Project in Chemistry Laboratory Curriculum to Improve Students' Scientific Writing Skills and Academic Performance

Alakananda Chaudhuri, Betsy Leverett, Kayla Brown, Rafael Adrian

Purpose

To enhance lab report writing skills, our team implemented and assessed a three-phase laboratory writing program in the undergraduate chemistry program designed to improve lab writing skills, classroom preparedness, and curriculum engagement. Writing lab reports is an integral part of chemistry education at all levels and has been associated with increased student engagement in learning.

Deficiencies in lab report writing skills and a lack of understanding among chemistry students about the importance of lab protocols have remained persistent issues in our chemistry lab courses. Student attitudes toward writing have often reflected the department's overall lack of focus in this area of chemistry pedagogy, and therefore, significant developments in student writing have been unusual, even in the upper-division lab courses. As a result, a typical student's perception is that writing in lab courses is a tiresome and optional burden rather than an educational tool. To address these issues, a long-term writing project was designed and implemented in the chemistry laboratory courses.

Methodology

The lab curriculum was restructured to incorporate writing practices, lab report scaffolding, and peer evaluation of student protocols with more focus on writing skills development. The study examines the chemistry lab report writing practices in successive lab courses: Chemical Principles I and II (general chemistry), Organic Chemistry I and II, and Quantitative Analysis. The grades of the student groups introduced to the writing training were compared against those of the control groups to establish direct writing improvement. Qualitative data was also collected each semester using exit surveys to measure how the students felt about writing lab reports.

The first phase of the project began in the fall of 2018 with control groups in the Chemical Principles I lab course and exit surveys administered and analyzed. In spring 2019, the first incremental lab report writing was implemented in the incoming Chemical Principles I groups, and exit surveys were conducted. The control groups in Chemical Principles II, Organic I and II, and Quantitative Analysis labs were also surveyed at the end of Spring 2019.

Findings and Next Steps

At the end of Fall 2019, phase I was completed, and qualitative data analysis of exit surveys were conducted. Future work will include grade comparisons between the Chemical Principles lab I and II control and writing treatment groups. Preliminary findings of the phase I data showed that students felt more prepared for the lab and confident about lab report writing. The phase 2 study, which was scheduled to begin in the spring of 2020, was interrupted due to the lab's conversion to virtual mode. The study is currently ongoing, and implementation of the writing project will be continued in Fall 2023 with new cohorts.

9H-FLUOREN-9-YL)METHANOL OXIDIZES TO KETONE/ALKENE PRODUCTS AND NOT 9H-FLUORENE-9-CARBOXALDEHYDE - HOW?

Rafael Flores

Primary alcohols routinely undergo oxidation to form aldehydes and carboxylic acids. However, repeated efforts to oxidatively synthesize 9H-fluorene-9-carboxaldehyde (a key intermediate for reductive amination steps in our designed series of anti-neurodegenerative small molecules) yielded 9H-fluoren-9-one (a ketone) and 9-methylene-9H-fluorene (an alkene) as products. The starting material [(9H-fluoren-9-yl)methanol] seems prone to oxidative cleavage and or reduction to ketone and alkene species in the presence of oxidants. Except that alkenes and ketones can form in the presence of an oxidizer under basic or acidic or heating conditions, the above reaction outcome is not well explained in the literature. To that end, this work presents the characterized ketone and alkene products under KMnO4 (strong oxidizer) and MnO2 (mild oxidizer) conditions and further suggests a potential mechanistic path for such a primary alcohol oxidative/reductive transformation. The proposed mechanism therefore attempts to explain this transformation as an oxidative/dehydration phenomenon and implicates enol intermediates.

SCI Monitoring soil quality in a time of change: The Headwaters at Incarnate Word

John Hooker, Helayna Anzures, Nyssa Bentz, Isabella Colquette-Romo, Hudson Whitney, Kristeen Rodriguez, Gabriela Sanchez, Oliver Soliz, Megan Weiss, Alison Wissa, Pamela Bal

The Headwaters Sanctuary, a 53-acre urban riparian forest, is managed by Headwaters at Incarnate Word. This green space is protected by a conservation easement to ensure that the only nature sanctuary in the heart of San Antonio, Texas remains undeveloped in perpetuity. Since the Sisters of Charity of the Incarnate Word founded the adjacent university, the University of the Incarnate Word (UIW), these grounds have served as a source of inspiration and learning about harmony in nature. Currently, the native habitat is threatened by invasive plant species, including Ligustrum, *Ligustrum japonicum*, and Chinaberry, *Melia azedarach*, which have been introduced by wind, water, and wildlife. Also, an area of the Sanctuary was previously used as a recreational sports field with invasive Bermuda grass, *Cynodon dactylon*, installed.

In fall 2019, Headwaters initiated an invasive plant management program to accelerate earlier efforts to remove invasive species. The current state of the soil, in terms of grain texture, pH, water saturation, and nutrient content, are not well constrained, nor are the effects of past and current land-use changes. Further, the land's urban situation renders it susceptible to soil erosion and litter accumulation. To create objective benchmarks for the quantitative tracking of soil quality over time, we presented the results of a soil survey of the Headwaters Sanctuary. We used Inverse Distance Weighting to extrapolate data from our sample sites. This technique enabled us to generate maps of soil characteristics and to document spatial variation in soil quality related to land use and vegetation. The UIW and Headwaters community seeks to incorporate the United Nations Sustainable Development Goals, in accordance with Pope Francis's encyclical of *Laudato Si,'* which compels us to care for all of creation. As part of this effort, we recognize the soil as the physical foundation of the entire ecosystem in this area and have pledged to work to understand how to care for the land and thereby improve our stewardship of the Earth.

ROSENBERG SCHOOL OF OPTOMETRY

A NEW TECHNIQUE TO RECORD THE PUPILLARY RESPONSE FROM MELANOPSIN SENSITIVE GANGLION CELLS

Loary Inclan, Jeffrey Rabin, Frances Silva

Our purpose was to develop a new, clinically expedient technique to record the human pupillary response from melanopsin-sensitive ganglion cells and observe how the response depends on the stimulus intensity.

Purpose: The purpose of this study was to examine the experience of foreign language anxiety (FLA) in heritage students of Spanish from a qualitative perspective. Previous research has suggested that, just like "traditional" foreign language students, heritage language students of Spanish can also experience FLA in the classroom. As the number of heritage students in our classes continues to grow, it is important for teachers to know how anxiety can affect these students. The primary research question for this qualitative study was: How do Spanish heritage students describe their feelings of anxiety about learning Spanish?

Rationale: Learning a foreign language can be quite a challenging task. One principal question in Second Language Acquisition theory is why some people are more successful at learning a second language than other people. Many factors come into play to determine the outcomes of the learning process, including individual differences such as cognitive abilities, personality characteristics, learning styles, metacognitive differences, social contexts, and affective aspects. Three main affective aspects include attitudes, motivation, and anxiety. In other words, what the learner brings to the learning situation and how the learner feels can have an impact on what is learned. One of the most important affective variables in learning a foreign language is foreign language anxiety (Horwitz, Horwitz and Cope, 1986). Foreign language anxiety has been found to have potential negative effects on academic achievement (e.g., lower course grades) (Horwitz, 1986; Saito and Samimy, 1996; MacIntyre, Noels and Clément, 1997), cognitive processes (e.g., not being able to produce the language) (MacIntyre and Gardner, 1994), the social context (e.g., communicating less) (Kleinmann, 1977; MacIntyre and Gardner, 1991a, 1991c; MacIntyre and Charos, 1995), and the reaction for the language learner (e.g., traumatic experiences) (MacIntyre, 1999; Price, 1991; Phillips, 1990). Thus, helping students reduce their anxiety can have important consequences for their ultimate language learning. Most studies on FLA have focused on the traditional language learners; this study changes that focus to Spanish heritage students and does so from a qualitative perspective.

Methodology: The subjects for this study came from 27 Spanish classes at a large, public university in the Southwest United States. 413 subjects (209 heritage students and 204 non-heritage students) participated in the study. Qualitative data were collected from open-ended questions on a questionnaire and from telephone interviews. The procedure of content analysis was followed to analyze the data.

Findings: Analysis of the qualitative data revealed several sources of anxiety for the heritage students in this study that were like sources of anxiety experienced by traditional foreign language students in previous studies. Interestingly, there were several sources of anxiety that were unique to the heritage students. The presentation will include sample quotes from the heritage students, thus providing a better understanding of the heritage students' views about foreign language anxiety (i.e., to hear directly from these students about their language-learning experiences). The presentation will end with implications for teaching and recommendations for future research.

Attitude changes toward genetic testing in optometry interns: Results from a longitudinal analysis with two sequential interventions

Patricia Sanchez-Diaz, David Fike, Stephanie Schmiedecke-Barbieri, Joyce Zhang

Purpose

This study aims to develop an instrument to assess the attitudes of optometry interns towards the value of genetic testing in the clinical setting and to identify the factors associated with these attitudes.

Rationale

With the recent development in molecular diagnosis and the expansion of clinical trials for gene and targeted therapy, genetic testing for inherited retinal disease has become the new standard. Clinicians in primary care settings may feel unprepared to incorporate this diagnostic tool into their practice. Work from others indicates that clinician attitudes toward genetic testing is a determinant factor for patients deciding to undergo genetic testing. Informed patients will be better equipped to 1) understand their condition, 2) initiate earlier interventions that improve quality of life, and 3) search for novel therapies.

Methods

Our Inherited Retinal Disease Genetic Testing (IRDGT) is based on the European International Cancer Risk Communication Study. IRDGT was validated by Cronbach's α and 2-factor exploratory factor analysis. Gender, ethnicity, and desired career path were collected. Our survey contained 8 items in the "Benefits subscale" and 6 items in the "Risks subscale". The Benefits subscale ranged from 1: very beneficial to 5: not beneficial at all. The Risks subscale ranged from 1: very high risk to 5: minimal/no risk. Fifty-six optometry interns completed the IRDGT survey 4 times: Before and after completing a Genomics course (Points 1 and 2) and then, before and after their Low Vision clinic rotations (Points 3 and 4). SPSS 25.0 (IBM) was used for statistical analyses; G*Power 3.1.9.2. in power calculations. Within- and between-subject scores on the Benefits (8 items) and Risks (6 items) subscales were measured using repeated measures ANOVA. The average score of each subscale was the dependent variable with four levels (Points 1-4; within-subjects factor). "Asian" and "Primary Care" were included as between-subject factors and "Elapsed Time" between pre-clinical (Point 3) and post-clinical (Point 4) measures as covariate. For a sample size of 56, the power of the ANOVA was .95.

Findings

Our sample was 67% females, 48% Asian, and the preferred career path, primary care (50%). The effects of Asian, Primary Care, and Elapsed Time (weeks between Points 3 and 4) were not contributory and thus removed from the model. Mean scores in the Benefits subscale differed across the 4 time points ($F(2.5, 136) = 15.24$, $p < .001$; Greenhouse-Geisser correction). No significant changes were observed in the Risks subscale ($F(2.7, 153) = .33$, $p = .78$). A post hoc pairwise comparison using Bonferroni correction showed improvement in the Benefits subscale score after both interventions, from 2.02 (SE=.08) pre- to 1.74 (SE=.07) post-didactic, and from 1.70 (SE=.07) pre- to 1.45 (SE=.07) post-clinical. No statistically significant change was observed between interventions (Points 2 and 3; 1.74 vs 1.7).

Conclusions

Using our IRDGT instrument, we found that a didactic and a clinical intervention were associated with improved attitudes toward genetic testing in optometry interns. The effects of the interventions were cumulative, and the five months elapsed between the post-didactic and the pre-clinical measure were not associated with changes in the mean scores of either subscale.

Binocular vs. Monocular Contrast Sensitivity (CS): A Comparison Between Large and Small Letter CS

Harrison Vo, Jeff Rabin, Frances Silva

Our purpose was to quantify the enhancement in low contrast vision when viewing with two eyes (binocular) vs. one (monocular), and to determine if this enhancement differs when using large vs. small letter targets.

Contrast sensitivity (CS) is the ability to detect the smallest difference in brightness between target and background (e.g., detecting a faint grey letter on a white background).

Thirty healthy young adults (mean age 27 ±6 years old, 17 females, 13 males) participated, and CS was evaluated with the large letter Pelli-Robson (PR) chart (20/700 letters) and the Small Letter Contrast Test (SLCT, 20/25 letters; both provided by Precision Vision Inc.).

Our findings exemplify the importance of binocular testing to quantify performance in clinical and occupational settings and how target size can influence results.

Color Correcting Lenses Enhance Cone VEPs in Color Deficiency

Jeffrey Rabin

Purpose
Our purpose was to further assess Visual Evoked Potentials (VEP) as a metric of Color Correcting Lenses (CCL) efficacy.

Rationale and Significance
Extended wear of Color Correcting Lenses (CCL) (www.enchroma.com) improves suprathreshold color perception in hereditary Color Vision Deficiency (CVD) even when CCLs are removed (Werner et al. 2020, doi.org/10.1016/j.cub.2020.05.054). We reported comparable results at threshold and suprathreshold levels including cone Visual-Evoked Potentials (VEPs, Rabin et al. 2022, doi:10.1038/s41433-021-01924-0).

Methodology
Thirteen CVDs (9 deuteranomalous, 4 protanomalous, age 32 ± 14, 13-66; CVD confirmed by Ishihara, anomaloscope, cone CS) provided informed consent to participate in our initial before-after design. Each subject was given a CCL appropriate for their CVD and tested without and with CCLs at baseline and after 11-14 days of wearing CCLs (2.5 ± 1.8 avg. hrs./day). Average cone specific pattern-onset VEPs (Rabin et al. 2016, doi:10.1167/tvst.5.3.8, 1 deg. checks specific to CVD and normal cones) were recorded to 75 pattern onsets without and with CCLs. Data normality allowed for ANOVA and t-tests (Bonferroni correction for multiple comparisons).

Findings
In CVDs immediate wear of CCLs yielded robust VEPs with increased amplitudes ($F=8.8$, $P<.005$) and decreased VEP latencies ($F=7.2$, $P<.01$) in response to the deficient cone stimulus compared to measures without wearing CCLs. Yet immediate use of CCLs had no effect on amplitude ($F=0.2$, $P>.68$) or latency ($F=0.6$, $P>0.43$) in response to the stimulus for the CVDs' normal cone type, indicating cone selectivity of this effect. Baseline mean VEP amplitudes for the CVD cone type without CCLs (3.6µV) was significantly less than mean amplitude with CCLs (6.4µV, $P<.002$). Baseline latency without CCLs (119.9 msec) was greater than with CCLs (90.8 msec, $P<.02$). Cone VEPs provided an objective metric of color with use of CCLs. Immediate impact of CCLs on VEPs improved amplitude 2X and decreased latency 30 msec.; long-term effects occurred in some but not all CVDs, probably because of wearing time variations, non-optimal matching of available CCLs to patient needs, and CVD severity. Future studies will include improved CCLs and control measures to address these issues.

Color Vision Loss in Plaquenil Toxicity: A Case Series

Erica Poole

Purpose

Our purpose was to determine if color vision is reduced when one acquires ocular toxicity from extended use of Plaquenil (hydroxychloroquine, HCQ). If so, color vision testing should be included in evaluation of patients taking Plaquenil.

Rationale and Significance

Plaquenil (hydroxychloroquine, HCQ) is a highly effective drug which can cause maculopathy even after discontinuance. 2016 AAO guidelines (https://www.aao.org/clinical-statement/revisedrecommendationson-screening-chloroquine-h;) dismiss color vision testing as insensitive and non-specific. We question this assertion with new information exemplifying sensitivity of cone color testing for detecting HCQ toxicity.

Methodology

Three patients referred by retinal specialists were assessed in our Visual Neurophysiology Service (VNS) for HCQ toxicity. Testing included refraction to best VA, Humphrey (HVF) central fields (10-2 SITA Standard), spectral domain ocular coherence tomography (SD-OCT), multifocal electroretinograms (mfERGs; ISCEV standard (www.iscev.org) which provide cone and cone bipolar cell function from multiple retinal sites, fundus autofluorescence (FAF), and cone specific contrast sensitivity (CS, Innova Systems, Inc.) which tests sensitivity of red (L), green (M), and blue (S) sensitive cones.

Findings

An asymptomatic 71-year-old Hispanic female with Arthritis took 200 mg HCQ daily for 20 years (total dose 1,460 g). VA: 20/15 OD (right eye), OS (left eye), FAF: macular pigment mottling OU, HVF: parafoveal sensitivity loss, SD-OCT: inner retinal thinning OS>OD, mfERGs: reduced foveal & parafoveal >OS, CCT: borderline L cone, decreased M cone CS, OS>OD.

A 50-year-old Hispanic female with Systemic Lupus Erythematosus (SLE) took 400 mg HCQ per day for 17 years (total dose 2,482 g; FAF). VA: 20/25 OD, OS, HVF: parafoveal scotomas OS>OD nasal extension OS, SD-OCT: full thickness macular thinning, FAF: Bull's eye degeneration, CCT: significant decrease all cones, >OS.

A 73-year-old White female with SLE taking 200 mg HCQ daily for 20 years (total dose 1,424 g) reported decreased color vision for 5 years. VA: 20/30 OD, 20/40 OS, HVF: parafoveal loss OD and central loss OS, SD-OCT: diffuse foveal thinning OU, IS/OS deformities, "flying saucer" OD, FAF: Bull's eye maculopathy OS>OD, mfERGs: decreased centrally OS>OD, increased fovea/ring 2 ratio OU, CCT: severe CS loss all cone types.

Conclusion

In conclusion, cone CS can be reduced in various stages of HCQ maculopathy, and its decrease can be the only presenting symptom. We advocate its use for HCQ patients and plan further studies to confirm its efficacy.

Cone Contrast Sensitivity and Color Naming: A New Color Vision Test

Frances Silva

Computer-based color contrast sensitivity (CS) tests diagnose the type and severity of hereditary color vision deficiency (CVD) and acquired CVD in various diseases. These tests are predicated on saturation discrimination but provide no information about hue and color naming. Our purpose was to develop a clinically expedient test of cone CS which includes a color naming score (cone contrast naming test; CCNT).

Cone Specific Contrast Sensitivity: A Comparison between Binocular and Monocular Sensitivity

Natalie Trevino, Jeff Rabin, Frances Silva

Purpose

Our purpose was to assess the potential improvement in cone specific color sensitivity when tested with two eyes compared to one.

Rationale and Significance

Contrast Sensitivity (CS) is the ability to detect the smallest difference between the brightness (luminance) or color of a letter compared to its background. Improvement is well established for black/white luminance CS, but evidence for binocular color CS enhancement is lacking. Both color vision normal (CVN) and hereditary color vision deficient (CVD) subjects were assessed with cone CS under binocular and monocular conditions.

Method

Fifty-six healthy young adults (26 CVN, mean age ± SD: 26 ± 5; 20 CVD, age 32 ± 12) participated. The Innova Systems, Inc. CCT was used to assess red (L), green (M), and blue (S) cone CS. Letters are presented in the center of a calibrated Microsoft Surface display. The subject uses a mouse to identify each letter seen from an adjacent matching display. A response driven staircase alters the contrast of the letters to determine the lowest contract seen (CS) for L, M, and S cones. Contrast varied from 1% to 16% in two steps for L and M cones and from 8% to 128% for the less sensitive S cones with CS normalized to a scale of 100. Repeated measures ANOVA and post-hoc t-tests with Bonferroni correction for multiple comparisons were used.

Results

There was no difference between right and left eyes for CVNs ($F = 0.33$, $p > .56$) or CVDs ($F = 0.03$, $p < .58$) hence the mean was used. In CVNs, binocular CS exceeded monocular across all cones ($F = 97.09$, $p < .001$) with differences between types ($F = 59.67$, $p < .001$; L cone CS: mean bin. vs. mon. difference: 10, 95% CI [7, 13], $p < .001$; M cone CS: mean difference: 3, 95% CI [0, 6], $p < .03$). Binocular enhancement in the normal cone of CVDs exceeded that of CVNs ($p < .05$) which likely reflects gain enhancement due to the greater number of unaffected cones (either L or M) In CVDs. These findings shed light on the utility of binocular testing of cone CS for occupational applications and detection of acquired CVD in various diseases.

EXPANDING OUR VIEW OF RETINITIS PIGMENTOSA

Joyce Zhang, Stephanie Schmiedecke-Barbieri, Patricia Sanchez-Diaz

Purpose

A 59-year-old Hispanic female presents to the Rosenberg School of Optometry Low Vision Clinic with gradual reduction in visual field loss over the last 2 years and extreme difficulty with her night vision. She was in denial of her condition and wanted a second opinion. She was previously diagnosed with retinitis pigmentosa (RP) ,Äì a type of inherited, progressive, retinal dystrophy- and had difficulty with night blindness and navigating her environment. The patient admitted to driving during the day and wanted to know what could be done for her.

Rationale and Significance

Her retinal findings were inconsistent with typical RP so genetic testing was completed to help narrow down the differential diagnoses. With the help of genetic testing, we were able to find variants that could possibly explain the type of RP she has. When clinical findings differ from the expected diagnosis, as optometrists and clinicians, further investigation is necessary to provide the best care and answers for our patients. The low vision exam and genetic testing was important to allow the patient to understand her condition and find ways to help her cope with her condition.

Methodology

We obtained information through a low vision exam and genetic testing. The low vision exam entailed visual acuity, contrast sensitivity, trial frame refraction, arc perimetry, fundus examination, color fundus photos, and binocular Esterman visual field. Genetic testing was completed by collecting a saliva sample in the office and then sent to Blueprint Genetics for analysis. Genetic counseling is then completed with the patient, a geneticist, and a low vision optometrist together in person once the results are obtained to answer any questions the patient may have from a genetic or functional standpoint with regards to their vision.

Findings

The patient's best-corrected visual acuity was 20/30 in each eye, and she was able to read 0.8M (20/40) with +2.50DS effective add. Her visual fields were less than 10 degrees and with a 4x12 reverse monocular telescope, she appreciated about 40 degrees of visual field. Ocular health examination revealed mixed cataracts, severely attenuated retinal arterioles, pale optic nerve with adjacent peripapillary atrophy, and diffuse retinal atrophy with scattered pigmentary changes. We recommended using a white cane and a flashlight to navigate around safely. Most importantly, we urged her to discontinue driving and use other transportation options such as paratransit or rideshare services. We also provided resources for low vision support groups to meet similar individuals. Our patient was heterozygous for 3 novel missense variants on the USH2A gene, which encodes for usherin, a basement membrane protein found in the inner ear and the retina. However, these were not identified as pathogenic variants. Despite having no molecular diagnosis, a genetic etiology may not be completely ruled out if the gene(s) causing the patient, phenotype have not been discovered yet. Based on our patient history, clinical findings, and the variants identified, the supported diagnosis was an atypical non-syndromic retinitis pigmentosa.

The Impact of Color Correcting Lenses on Cone Specific Color Naming

Liqing Li

The purpose was to assess the impact of color correcting lenses on cone specific color naming in hereditary color vision deficiency.

THE IMPACT OF COLOR CORRECTING LENSES ON CONE SPECIFIC CONTRAST SENSITIVITY

Gary Anderson, Jeff Rabin, Francis Silva

Our purpose was to assess the impact of color correcting lenses on cone specific color sensitivity in hereditary color vision deficiency.

The Impact of Color Correcting Lenses on Supra-threshold Cone Specific Color Perception

Erica Lee, Jeff Rabin, Frances Silva

Our purpose was to assess the impact of color correcting lenses on suprathreshold cone-specific color vision hereditary color vision deficiency.

Normal color vision (CVN) is essential for accurate color discrimination in multiple occupations such as aviation and transportation, law enforcement, military operations, and medicine (e.g., accurate discrimination of skin tone). CVN requires three cones sensitive to red (long wavelength light, L cones), green (middle wavelength light, M cones), and blue (short wavelength light, S cones). Yet 8% of males and 0.5% of females have hereditary X-linked color vision deficiency (CVD): L or M cones are absent (2%), or the peak sensitivity of defective cones is shifted in wavelength. Color correcting lenses (CCLs, www.enchroma.com) with notch filters, which increase peak wavelength sensitivity between normal and CVD cones, have improved suprathreshold red-green perception in CVDs (Werner et al. 2020, https://doi.org/10.1016/j.cub.2020.05.054). Herein we strive to determine if these benefits are specific to the CVD cone type.

Thirteen CVDs (9 green/deuteranomalous, 4 red/protanomalous, mean age 32 ± 14, range 13-66; CVD confirmed by Ishihara book test, anomaloscope matching test, and cone contrast sensitivity) participated after providing written informed consent in accord with our IRB approved protocol. Each subject was given a CCL appropriate for their CVD and tested with and without CCLs on the suprathreshold matching task. Five L and M cone-specific circular targets (contrast 1-16% in 2x steps, presented as first L, then M) were shown in random order, and subjects matched each to the achromatic grey targets presented simultaneously in random order at the same contrast levels. Results were evaluated as correct matches separately for protan and deutan subjects.

There was a significant improvement in suprathreshold color contrast matching for protan ($P < .04$) and deutan CVDs ($P < .04$) with overall improvement significant: $P < 0.0$. These findings are consistent with Werner et al. but extend their results to cone-specific enhancements most relevant for CVD. Indeed, suprathreshold color perception can be improved with CCLs.

MOLECULAR BIOLOGY IN LOW VISION: A CURRICULAR INTEGRATION TO REFOCUS BARRIERS TOWARD GENETIC TESTING IN OPTOMETRY

Patricia Sanchez-Diaz, Stephanie Schmiedecke-Barbieri, Joyce Zhang

Purpose
This qualitative study attempted to identify optometry interns' perceived barriers about the incorporation of genetic testing in their practices and the effect of an integrative curricular intervention involving molecular biology and low vision.

Rationale and Significance
With the recent developments in molecular diagnosis and the expansion of clinical trials for gene and targeted therapy, genetic testing for inherited retinal disease has become the new standard. However, clinicians in primary care settings may feel unprepared to incorporate this diagnostic tool into their practice. Prior research indicates that clinician attitudes toward genetic testing is a determinant factor for patients deciding to undergo this testing. Informed patients will be better equipped to 1) understand their condition, 2) initiate earlier interventions that improve quality of life, and 3) search for novel therapies.

Methodology
Our integrative approach consisted of a 2-step didactic intervention. During the fall of the interns' third year (baseline) they studied genetics and molecular biology of inherited retinal disease (IRD) and during the spring a didactic course in low vision. The clinical intervention occurred during the fourth-year rotation in the low vision clinic. During their low vision rotation, fourth year optometry interns engaged in diagnosis and counseling of patients undergoing genetic testing for IRD. Interns identified eligible candidates based on clinical presentation and family history and collected patient samples. Interns observed faculty members and the low vision resident working as an interprofessional team while discussing the results of the genetic test with the patients, together with its functional implications for vision loss. Before and after the intervention, 56 interns were asked: "Which would be the main challenge(s) you foresee regarding the incorporation of genetic testing in your practice?" and "How would you try to address the challenge(s)?". Taguette software was used for response coding and theme identification with a combination of emergent and structural coding approaches to cluster interns' responses and to identify and compare salient themes at baseline (pre-didactic survey) and after the two-step intervention (post-clinical survey).

Findings
Twelve thematic codes were identified in the "perceived barriers" (Q1) and 13 codes in the "possible solutions" (Q2) questions. We scored hits for each code at baseline and after the intervention. To rank and compare the most frequent codes pre- and post-intervention, each code was expressed as a ratio (i.e., code frequency/total number of hits). Costs (.48 ratio), and reluctant patients (.16 ratio) were the top 2 barriers at baseline. After the intervention, cost still ranked first (21 hits: .28 ratio) but clinician knowledge and IPECP team became the top 2 barrier (16; .21). Post-intervention, clinician-associated barriers ranked first with a ratio = .39 vs .13 at baseline. Patient education was the most cited strategy pre- and post-intervention (26; .28 pre- vs. 17; .21 post-). Insurance coverage (14; .15) and seeking collaborators (15; .18) ranked second pre- and post-intervention, respectively. Before the intervention, interns placed the focus on external issues (e.g., elevated cost of testing or patient-controlled factors). A set of clinician-controlled factors (e.g., limited knowledge and expertise in the field) became the focus after the intervention. Interns listed "education in the genetics of IRD," "building interprofessional collaborations," and "participating in research" as strategies to address these barriers.

Low Vision Management of Student that is Heterozygous for ABCA4

Lydia Han, Stephanie Schmiedecke

This case report describes the benefits of low vision management for a young student who was genetically confirmed to have a hereditary retinal condition called Stargardt disease. In general, people with this condition are affected at an early age and tend to progressively lose vision over time. The report demonstrates that despite the significantly reduced vision, Stargardt disease patients benefit from low vision rehabilitation. As genetic testing becomes more readily available, patients who present with suspicious conditions can be cared for sooner.

Research shows that at least one in 8,000 to 10,000 people are being affected by Stargardt disease; it is important to inform these patients that they can be helped, and the condition can be managed to meet their vision goals. The information presented in this case report can be used to inform medical practitioners of low vision services available to patients who are losing their vision because of ocular diseases. By increasing awareness of low vision rehabilitation, the hope is that more patients with low vision will get the care they need for a better quality of life.

Genetic testing was performed to better understand the patient's hereditary ocular disease using Blueprint Genetics and MyRetinaTracker. Based on the diagnosis, the patient was evaluated for low vision rehabilitation. To meet the patient's low vision goals, the following devices were evaluated:

- +8D Prismatic Microscope for reading, writing, and performing near tasks at school. With the patient's reserve accommodation, a spectacle microscope of 8D helped the patient meet his near vision goals of about 1M (Snellen equivalent 20/50).
- Sight Scope Flip 2.2x by Ocutech for watching TV or seeing teacher at front of classroom. The patient's distance vision improved to 20/50 with this device. By combining this device with sitting closer to the teacher, the patient should be able to achieve his distance goals in the classroom.
- 5x20 Monocular telescope for quick scanning, scoping, and locating objects at the distance to help him during PE. He was trained to use the telescope over his left eye (better seeing eye) and could perform quick scoping and scanning. The patient's VA improved to 20/30 with this device.
- This case demonstrates the advantages of genetic testing in low vision rehabilitation and management. The genetic test report found a mutation in the ABCA4 gene which is mostly associated with Stargardt disease.

Using this information, we were able to provide the patient with the appropriate low vision aids to meet his daily life goals and optimize his functional vision giving him a better quality of life despite his hereditary condition. Early intervention is particularly important in young adult patients as untreated vision problems can be associated with poor school performance and have profound functional and psychological implications overall. As optometrists, we can work with geneticists to provide genetic testing to our patients to give them a better understanding of their inherited retinal diseases or suspected inherited retinal conditions. Genetic testing not only opens doors to future treatments for the patients but also allows optometrists to better prepare a plan for the rehabilitation of patients. Cooperatively, we can work as a team to maximize the life of young students and adults born with visual impairments and help them to meet their potential and not be limited by low vision.

Neuro-adaptive Effects of Color Correcting Lenses in Color Vision Deficiency

Harper Gillentine, Jeff Rabin, Frances Silva

Purpose

We wanted to determine whether changes in color performance occur in color vision deficiency after extended wear of color correcting lenses.

Rationale and Significance.

Normal color vision (CVN) is essential for accurate color discriminations in various occupations including aviation, transportation, law enforcement, and military operations, and medicine (e.g., accurate discrimination of skin tone). CVN requires three cones sensitive to red (long wavelength light, L cones), green (middle wavelength light, M cones), and blue (short wavelength light, S cones). Yet 8% of males and 0.5% of females have hereditary X-linked color vision deficiency (CVD) because L or M cones are absent (2%) or peak sensitivity of defective cones are shifted in wavelength. Color correcting lenses (CCLs, www.enchroma.com) with notch filters, which increase peak wavelength sensitivity between normal and CVD cones, improved suprathreshold red-green perception in CVDs after extended wear even without viewing through CCLs (Werner et al. 2020, https://doi.org/10.1016/j.cub.2020.05.054). Less is known about potential long-term effects of CCLs on cone specific threshold and suprathreshold function.

Methodology

Thirteen CVDs (9 green/deuteranomalous, 4 red/protanomalous, mean age 32 ± 14, range 13-66; CVD confirmed by Ishihara book test, anomaloscope matching tests and cone contrast sensitivity, CS) participated after providing written informed consent in accord with our IRB approved protocol. Each subject was given a CCL appropriate for their CVD and tested with and without CCLs at baseline and 11–14 days later after wearing the CCLs daily (mean h/day: 2.5 ± 1.8). Cone CS and color naming were assessed by presenting letters visible only to L, M, or S cones and gray luminance letters on a Surface Pro in randomized order within and between sessions. Subjects verbally identified each letter and its color with scoring (0–100) based on letters correct. Cone specific brainwaves (visual evoked potentials, VEPs, Rabin et al. 2016, https://doi.org/10.1167/tvst.5.3.8) were recorded to an average of 75 pattern onsets without and with CCLs.

Findings

Following an average 12 days of CCL wear, cone CS and color naming improved for the letters representing the defective cone type without wearing CCLs (mean CS improvement: 15, 95% CI: 8–21, $P < 0.001$; mean color naming improvement: 19, 95% CI: 7—31, $P = 0.004$; 85% improved without CCLs, $P < 0.001$). In addition, after 12 days of CCL wear and tested without CCLs, 80% of CVDs showed a selective increase in VEP amplitude for the stimulus representing the defective cone type (mean increase: 2.1 ¬µV, 95% CI 1.0 –3.2, $P = .04$) and 75% showed decreased VEP latency (mean decrease 14.3 msec), but changes were not significant when compared to baseline without CCLs ($P > 0.37$). Our results show that both threshold (CS) and suprathreshold (naming, VEPs) neuro-adaptive improvements can occur in CVDs after extended use of CCLs.

Using Vision Therapy to help treat the symptoms experienced from Acquired Brain Injury secondary to COVID-19 infection

Elizabeth Everson

Background

Acquired brain injury is not hereditary, congenital, degenerative, or induced by birth trauma. This type of injury results in a change to the brain's neuronal activity, which affects the physical integrity, metabolic activity, or functional ability of nerve cells in the brain. Visual symptoms of both a traumatic and acquired brain injury include visual acuity problems, visual field loss, oculomotor dysfunction, accommodative dysfunction, photophobia, and reduced visual attention. The term used to describe these patients is post-trauma vision syndrome (PTVS). This syndrome is characterized by binocular function problems, stemming from a dysfunction of the ambient visual process.

Case Summary

A 38-year-old female presented to the Rosenberg School of Optometry Primary Care Clinic in November of 2020 complaining of difficulty focusing out of her right eye. The patient stated that since contracting a severe case of COVID-19 in June of that year she has had difficulty with reading, eye pain, and severe nausea and dizziness, especially when navigating crowded environments. At this initial examination, the patient was found to have accommodative insufficiency, convergence insufficiency and oculomotor dysfunction. She was then referred for a vision therapy evaluation and recommended to undergo 30-40 in-office vision therapy sessions focusing on development of vergence ranges, improving amplitudes of accommodation, and improving the relationship between visual, proprioceptive, and vestibular aspects of her vision. The patient also responded positively to a blue tint, low plus, and binasal occlusion. After 16 sessions, the patient is showing significant improvement in vergence, accommodation, and oculomotor skills as well as improved comfort and function.

Conclusion

Neuro-rehabilitative vision therapy is an effective means of treating brain-injury patients. COVID-19 has impacted many patients' daily lives, and this case report exhibits how optometry can directly treat those who may have ongoing symptoms post-COVID-19 infection.

Self-awareness in Mission Trip Patients: The Road to Prevention by Data-driven Design

Daniela Oyola Pacheco, Lourdes Fortepiani, Jeannette Wong-Powell

Visual impairment results in financial loss, loss of independence, and overall decreased quality of life. In geographical areas with high sun exposure like Yucatan, Mexico, there is a high prevalence of eye conditions derived from high ultraviolet (UV) exposure; however, the incidence of these disorders in this population is unknown. Our mission there consists of one-week-long annual trips that serve patients with diverse ocular conditions, including those derived from UV light exposure such as pterygium and cataracts. Thus, our goal was to identify gaps in patient awareness of these preventable eye disorders and to generate educational materials to close that gap. To determine awareness, 349 patients seeking an evaluation by our team between 2018-2020 were invited to answer a survey at the time of their ocular exam. Questions included inquiries about prior eye examinations, the impact of vision loss on productivity and personal development, personal UV light protection habits, and the role of UV light in the pathogenesis of eye conditions. In addition, once the trips concluded, patient charts were analyzed to estimate the prevalence of these ocular conditions in this population. Students obtained Institutional Review Board (IRB) approval to perform a retrospective review of the patient charts and surveys according to the tenets of ethical research involving human subjects as stated in the Declaration of Helsinki. We found that 83% percent of patients reported that decreased vision had prevented them from working or developing their potential, 64% had an eye exam prior to our trip, 58% exhibited moderate to severe cataracts, and 25% pterygium. Despite the high incidence of cataracts and pterygium, only 4.4% and 2.7% respectively, were aware of the role of UV in cataract and pterygium formation. Of note, 73% of the patients reported the use of some kind of UV eye protection such as a hat or sunglasses. In conclusion, patient awareness of UV light's role in eye conditions development is low, and patient sun-protection methods are not aimed at preventing cataract or pterygium formation. Based on these findings and with the assistance of the RSO Spanish Optometric Society, we generated a series of brochures and posters in Spanish to educate the patients on those specific ocular conditions in future mission trips. By using data-driven analysis, outreach volunteers can optimize the content, type, and scope of patient education materials to reach a larger number of individuals and promote self-management of risk factors.

School of Osteopathic Medicine

Analyzing the Value of a Virtual Two-Part Safe Space Training Designed for Osteopathic Medical Students

Zoe Daily, Theo Costin, Shawn Janarthanan, TJ Dean

Background
The LGBTQI+ community is medically underserved partly because the average medical student receives only 5 curriculum hours of LGBTQI+ related education. Programs such as Safe Space Training can better prepare future physicians in efforts to obtain sexual history and in overall patient health education. Further, COVID-19 has shown an increased need for online platforms for medical education.

Objective
To determine if utilization of an online platform, such as Zoom, can increase confidence in medical students to provide competent, quality care to LGBTQI+ patients.

Methods
The study was performed in two phases administered through the online platform, Zoom. The subjects consisted of medical students from UIW School of Osteopathic Medicine. Subjects received an online survey with questions of comfort to complete and return at the end of each session. Blinded survey responses were used in our data aggregation.

Results
A total of 55 subjects participated (*n*=55) in the Phase 1 Training survey and 35 subjects participated (*n*=35) in the Phase 2 Training survey. Our surveys consisted of a Likert Scale ranging from 1 point=strongly disagree to 5 points = strongly agree. According to the survey, the question regarding comfort in providing culturally competent care to LGBTQI+ patients' ' received a mean of 3.16 in responses with a SD=0.938 and standard error mean of 0.127 for Phase 1 and a mean of 3.23 in responses with a SD=0.843, and standard error mean of 0.143 for Phase 2. After the training, the same question received a mean of 4.38 with a SD=0.623 and a standard error mean of 0.084 for Phase 1 and a mean of 4.69 in responses with a SD=0.471 and a standard error mean of 0.080 for Phase 2. A performed T-test rendered 0.001, indicating statistical significance for both phases.

Conclusions
The survey responses demonstrated a positive shift, indicating an increase in subject comfort after receiving Safe Space training via the online platform, Zoom. These findings prove that a web-based Safe Space training is an avenue of LGBTQI+ medical education and can promote culturally competent education while also increasing the standard of care provided to this underserved community.

Bilateral extra-renal pelvises and calyxes with additional renal blood vessel variations identified in a single prosected medical school donor/cadaver

Denise Nemeth

There are commonly observed, reported anatomical variations associated with the posterior abdominal wall, especially with the kidneys. This report addresses multiple variations in one prosected medical school donor body (Caucasian, male, age 86). These variations could contribute significantly to negative outcomes, especially in surgical procedures. Our cohort found extra-renal pelvises and calyxes located bilaterally in a male 86-year-old donor body. The right kidney had two extra-renal major calyxes, with two extra-renal minor calyxes off the inferior major calyx, and three extra-renal minor calyxes off the superior major calyx. The left kidney had four extra-renal major calyxes with two minor calyxes off the most inferior major calyx.

In the venous drainage, there was a right accessory renal vein at the hilum that drained into the posterior of the inferior vena cava. There was an accessory testicular vein off the right renal vein, as well. Additionally, there was a left accessory renal vein at the hilum that drained to the posterior portion of the left renal vein and was joined by a lumbar vein. An accessory left testicular vein was also noted. Observation of arterial supply of the kidneys and the posterior abdominal wall revealed that the right kidney had a pair of polar (aberrant) renal arteries which came directly from the abdominal aorta. In addition, there were two long main hilar renal arteries to the right kidney. There were hilar renal arteries from the abdominal aorta to the left kidney and a polar (aberrant) branch that supplied the upper pole of the left kidney. Lastly, the cohort found that the left common iliac artery was 6.8 cm long compared to the right common iliac artery which was 2.7 cm long.

Chronic Kidney Disease (CKD) Prevalence in Outlier Counties of Texas Related to CKD Comorbidities, Ethnic Composition, and Dietary Pattern

Si Qi Tong

Medicare fee-for-service (FFS) spending for beneficiaries with chronic kidney disease (CKD), but without end stage renal disease (ESRD) exceeded $81.8 billion in 2018 and represented 22.3% of Medicare FFS spending. CKD places great strain on national healthcare costs. Additionally, the healthcare costs of CKD in the State of Texas were found to be disproportionately high compared to the United States' average. In this systematic review, data from the Centers for Disease Control and Prevention (CDC) 2019 calendar year, limited to residents enrolled in Medicare and excluding those with ESRD, was used to illustrate how the prevalence of CDK has increased in Texas counties. This data was further analyzed to correlate CKD prevalence with a low socioeconomic status (SES), low family income, and along ethnic lines. Outlier rural counties were analyzed to gain greater understanding of how the incidence of CKD is affected by diabetes mellitus, incidence of hypertension, access to healthcare, dietary patterns, and population composition of Hispanics and African Americans. Additionally, CKD was correlated with increased severity of COVID-19. After analysis of causative factors of CKD in these counties including comorbidity rates, ethnic composition and dietary patterns, the most significant factors were the presence of comorbidities and location. The results of this study are important for informing state officials for financial allocation and to decrease mortality of current and future CKD patients in Texas, particularly in its rural counties. Results indicate that access to both healthcare and better nutrition in rural areas must be improved to decrease the incidence of hypertension and diabetes and further development of the comorbidity, CKD.

Identification & Analysis of the Reasons Underlying Covid-19 and Influenza Vaccine Hesitancy in the Adult Male Hispanic and Latino Population: A Comprehensive Literature Review

Hanna Von Haefen

Vaccinations are an important public health prophylactic that reduces the spread of infectious disease. Currently, within the United States the two most notable vaccines are the seasonal influenza vaccine and the SARS-CoV-2 vaccine. In examining the vaccination rates in the minority and White populations, it has been noted that vaccination rates are lower within Black and Hispanic communities. Since the Hispanic population comprises almost 24% of the San Antonio population, this review has attempted to identify the factors involved in reducing vaccine compliance within the Hispanic population, discuss its effects on the health of the unvaccinated, and introduce potential solutions that can be used to minimize these factors. Ultimately, education, accessibility, and cultural barriers were identified as the three main overarching factors involved in reduced vaccination rates within Black and Hispanic communities of San Antonio.

Investigating Barriers to Reporting Antimicrobial Resistance in Bexar County Hospitals

Bailie Moorhead, Niva Shrestha, Zackary Herrle, Sydney Vangeli, Marcheta Hill, Danielle Natividad Jackson, Margaret Jonas

Due to several factors, antimicrobial resistance (AMR) has expanded rapidly since the 20th century. The growing number of antimicrobial-resistant microorganisms and consequent declining efficacy of antimicrobial treatments have led to the increasing morbidity and mortality of infections, both in the United States and worldwide. Previous research has focused on (1) the development of AMR in specific microorganisms, (2) inappropriate antimicrobial prescribing practices, and (3) areas within the healthcare system that have the highest potential for antimicrobial-resistant infections. In response to the growing AMR crisis, the Antimicrobial Resistance (AR) Lab Network was designed to detect AMR, prevent outbreaks, and develop diagnostic tools for the management of resistant microorganisms. However, the AR Lab Network has a low submission rate for antimicrobial-resistant isolates, which hinders their efficacy. Therefore, our research team at the University of the Incarnate Word School of Osteopathic Medicine (UIWSOM), in partnership with the Texas Department of State Health Services (DSHS), developed a survey to investigate the barriers to submitting antimicrobial-resistant isolates in hospitals in Bexar County, Texas. The survey was distributed to laboratory managers, laboratory directors, and infection preventionists in June 2021 and assessed the participants' knowledge of the AR Lab Network, frequency of antimicrobial-resistant isolate submission, and perceived barriers to submitting antimicrobial-resistant isolates. The survey results were collected and analyzed to identify specific barriers to submitting antimicrobial-resistant isolates. The data is being used to address these obstacles by creating infection prevention education programs to improve awareness of the AR Lab Network and to increase antimicrobial isolate submissions among hospitals in Bexar County.

The Path of Most Resistance: A Rare Instance of Metastatic Pancreatic Adenocarcinoma Identified Within Skeletal Muscle

Caitlin Harmon

Soft tissue neoplastic metastases, specifically to the skeletal muscle, are uncommon in comparison to metastases within the abdomen, thorax, or intracranial regions. Specifically, pancreatic adenocarcinoma with skeletal muscle metastasis is a rare clinical phenomenon and is hardly reported. There is a high mortality rate after the diagnosis of metastatic pancreatic adenocarcinoma, attributed to inadequate screening and advanced staging upon incidental discovery. Rarely, metastatic lesions manifest in the skeletal muscle and are hardly documented. Some of the factors that deter skeletal muscle tumor implantation include the deficiency of skeletal muscle mediators and genetic makeup of the primary tumor. Surgical resection of pancreatic adenocarcinoma with adjuvant chemotherapy demonstrates the best prognosis; however, surgical management is usually limited to patients without known metastatic disease. Alternative treatment options such as chemotherapy and radiotherapy are used in the palliative care setting. Here, we present the case of a patient with previously diagnosed and treated pancreatic adenocarcinoma in remission, with biopsy-proven metastases isolated within the skeletal muscle.

What Makes a Good Doctor: A Qualitative Study of Medical Student Perspectives

Vincent Hoang, Tyler Larkin, Hillary Guerrero, Hanna Kinzel, Savannah Heath

Background

This study examined the similarities and differences between medical students' and patients' perceptions of what makes a "good" doctor. Results were compared to the results of the study *What Makes a Good Doctor: A Qualitative Study of Patient Perspectives* by Davis et al., in hopes of bridging the gap between medical student and patient perspectives. The previous study revealed four key themes: Communication, Holistic Care, Practice Management and Patient Education. The most mentioned themes were providing care and communication, while the most frequently used words were caring, compassionate, trustworthy, and knowledgeable [1].

Methods

The same free-response single question given in Davis et al. was used to highlight areas of improvement in physicians. Using *Survey Monkey* the questionnaire was emailed out through the University of The Incarnate Word School of Osteopathic Medicine to all first- through fourth-year medical students. Students were asked to describe what they considered a "good" doctor to be. Responses were analyzed and grouped according to recurring themes and relationship to the themes used in Davis et al.

Results

The results were collected over 21 days and 76 responses were submitted. The themes that continued from Davis et al. were Communication, Holistic treatment, Practice management, and Patient education. The category of Competency was added because there were multiple responses by medical students along that line, and they did not fit the previous Davis et al. categories. The response of 'Doctors who listen,' a sub-theme of Communication, was reported in 27.6% of responses. 'Acknowledging patient concern,' another sub-theme (of Communication), appeared in 9.2% of responses. 'Thoroughness' was mentioned by 10.5%, 'Treats the whole patient' by 9.2%, 'Empathy' by 22.4%, and 'Compassion' by 21.1%. Each of these were grouped under holistic treatment. As a sub-theme of Practice management, 'Time/quality of time spent with patient' reported at 3.9% and 'Team player/good leader' at 3.9%., together made up 14.3% of responses. 'Patient education' was reported 11.8% of the time, and 'whole competency' was discussed in 31.6% responses.

Conclusion

This study demonstrated that listening and empathy helped influence both patient and medical student perceptions of a "good" doctor. Practice management was important for patient satisfaction but appeared less important to medical students. The competency of the physician was important to medical students but was not mentioned by the patients. Moving forward with this data, it is important to find ways to bridge the disparity between those training to become physicians and patients' perspectives. Additionally, future practice management training in medical education may demonstrate ways of improving patient satisfaction.

School of Physical Therapy

Enhancing the Learning Conversation: Using a Weekly Feedback Tool to Enhance Helpful Feedback in the Clinical Setting

Chad Jackson, Caitlin Hartjes, Marshall Sanderlin

This study's purpose was to determine the effectiveness of a weekly summary tool designed for the given student and clinical instructor to reflect on student progress in the clinical setting. The tool's main purpose was to facilitate communication and provide formative feedback to enhance student learning.

Graduate Student Perspectives on Belonging and Meeting the Diversity, Equity, and Inclusion Needs in a Doctor of Physical Therapy Program

Jasmin Pena, Savannah Bailey, Rachel Downer, Tara Khalili, Mona Bains

Purpose

We assessed whether we could simultaneously create an experience that centered belonging and peer-to-peer relationships with an opportunity to promote diversity, equity, and inclusion (DEI) discussions and understand the diverse needs and DEI perspectives of DPT students at the University of the Incarnate Word (UIW), School of Physical Therapy (SoPT).

Rationale and Significance

As a minority serving institution UIW's SoPT is comparatively more racially/ethnically diverse than other nationally accredited PT programs, with the past 4 years of available data showing 43% Hispanic, 7% African American, 12% Asian and 37% White students (1% other/unknown). This increased representation comes with an increased responsibility to understand the diverse needs of our student body in all areas of diversity (racial/ethnic, gender/sexual, socioeconomic etc.) and specifically relating to DEI.

Even within diverse student body populations there are inconsistencies in the way diversity is defined. This can be a barrier for DEI initiatives and leads to a mismatch between the institution's stated efforts, the perceptions of students, and the change that occurs. Additional barriers include lack of familiarity with the vocabulary of DEI, a lack of a DEI lens in the curriculum, and inconsistencies in policies, procedures, and support. Structured experiences centered on topics such as diversity, intersectionality, and implicit biases, could provide background information and guide learning about these topics. This could foster connections between peers and faculty, as well as empower students to apply their knowledge and experiences to evolve current healthcare practices. The study investigated student perspectives regarding DEI with an emphasis on diversity, by creating a space and opportunity to share personal accounts.

Methodology

Using a mixed-methods study design, 107 students from the SoPT were invited to participate in "Real Talk: A Graduate School Connection and Networking Event for UIW, SoPT Students", a 3-hr summer event adapted from the game, "we're not really strangers." The game consisted of 3 timed rounds of specifically themed questions and discussions among the randomized participant groups. Round 1 employed the theme "perception" for 20 minutes, followed by round 2 with the theme "connection." The second round involved more elaborate questions, discussed for 40 minutes. Round 3 was a 45-minute alumni panel discussion to share experiences of diversity and inclusivity in graduate and post graduate work. Additionally, in Round 3 there was an opportunity for reflection, wherein participants could discuss the previous 2 rounds and panel discussions as a part of their conversations for 15 minutes. Each round was followed by a Poll Everywhere with 3 Likert-scale questions assessing comfort level. An anonymous survey with Likert scale questions for event quality ratings and diversity-focused questions was distributed following the event.

Findings

Twelve students participated in the "Real Talk" event and 10 students responded to the post event survey. Participant comfort level increased from Round 1 to Round 3 of the Real Talk game. Likert scale event survey questions ranging from strongly disagree to strongly agree indicated the Real Talk rounds were perceived as meaningful and important (100% combined agree and strongly agree), alumni panel discussion was impactful with meaningful and relevant topics (20% combined disagree and strongly disagree; 80% combined agree and strongly agree), participants connected with people with similar/shared experiences (20% combined disagree and strongly disagree; 80% combined agree and strongly agree), participants connected with people with different experiences than their own (100% combined agree and strongly agree) and perceived the event overall created an open environment to share and create meaningful connections (100% combined agree and strongly agree). Perceived SoPT satisfaction levels across DEI categories revealed 10% to 50% dissatisfaction and 20% to 70% satisfaction in the areas of programs/resources available to foster success of a diverse body; activities to increase diversity awareness; opportunities to relate/interact with diverse

persons; support, resources, and affirmation of needs of persons with disabilities, LGBTQ+ individuals and individuals from diverse racial and ethnic backgrounds.

Conclusions

The needs of a diverse study body are complex and vary depending on the diversity category and potential intersections. Participants voiced needs in the areas of more self-understanding of inclusive practices, hosting events like Real Talk, curriculum inclusion for diverse populations including LGBTQ+ individuals, and opportunities for youth mentoring programs. Supporting the needs of a diverse study body, while also expanding the knowledge of their majority counterparts on racial/ethnic and gender/sexual biases, can collectively foster inclusive spaces and innovation in the health professions with the potential to expand such care to areas with greater societal needs.

Physical Therapy Students' Beliefs and Perspectives on Strength Training: A Qualitative Analysis

Brian Johnston, Steven Zuniga, Andres Lopez, Trentice Lazard

Strength training (ST) has been shown to be an effective means of prevention and treatment for multiple pathologies. There is a growing body of evidence that ST is more successful than other forms of exercise for management of some conditions, especially those with sarcopenia or metabolic components. Despite published evidence demonstrating efficacy, some have claimed physical therapists use strength protocols that are not supported by scientific research and underdose strength interventions in otherwise suitable populations. Physical therapists' professional opinions on ST determine its use in current clinical practice but are poorly described in scientific literature. Similarly, the beliefs about ST among matriculating PTs are unknown but will inevitably affect its use in future practice.

Purpose

The purpose of this study is to describe the attitudes and opinions of nascent physical therapists about ST concepts and their place in the treatment of illness and disability.

Methods

Investigators conducted a thematic analysis of semi-structured interviews with eight pre-PT undergraduate and freshman Doctor of Physical Therapy (DPT) students. Interview responses were discussed in an iterative process to determine themes among participants. Commonalities and variations were identified and analyzed to draw conclusions about the sample.

Results

Important themes across all participants were ambiguity on the definition of ST, high perceived value of physical therapist personal participation in ST, and desire for continued education with ST. Among those participants rated most experienced by investigators, themes included intent to use ST in treatment with future patients, participation in coaching roles, and increased awareness of specific risk factors with perceived high-risk populations.

Conclusion

Prior to PT school, student experience with ST is extremely inconsistent. There is also extraordinarily little consensus on what even constitutes ST, but high interest in its inclusion in PT practice and education. This interest appears to be independent of individual experience. Effects, desirability, and inference from conclusions are beyond the scope of this study but should be considered. Analysis findings should be used to spark dialogue on ST in the PT profession, in DPT curriculum, and its use in patient treatment.

Soft Tissue Mobilization Reduced Neck and Upper Back Discomfort and Increased Range of Motion

Faith Brough

Purpose
Limited research reveals that the use of different soft tissue mobilization techniques increases tissue mobility and decreases pain in various regions of the body. The objective of this study was to determine if there is a difference between using Instrument-Assisted Soft Tissue Mobilization (IASTM) or Therapeutic Cupping (TC) on neck and upper back discomfort.

Methods
This was a cross-sectional study conducted in a research laboratory. A sample of 30 subjects (males = 11; females =19) between the ages of 18 and 68 (average age = 26.5) with neck and/or upper back discomfort participated in this study. Subjects attended one session during which both interventions were administered with each side of the neck and upper back region randomized to receive a different intervention. The IASTM and TC were administered for 5 minutes each, over the entire area of the neck and upper back. The treatment area spanned the space between the nuchal line of the skull and the superior third of the medial scapular border and across the spine of the scapula to each side. The intervention measurements include numeric rating scale, superficial skin temperature, and inclinometer measurements for neck ranges of motion including forward flexion, lateral flexion to the right and left, extension, and rotation to the right and left. The timeline for data collection included: 1) measurements for the first randomized side; 2) five-minute treatment with the first intervention; 3) measurements repeated for post intervention outcomes; 4) a repetition of the same steps with the contralateral side and the other intervention.

Results
A 2 [intervention] x 2 [time] repeated measures ANOVA revealed a significant main effect difference for superficial lateral flexion to the left for the IASTM and forward flexion for TC ($P > 0.05$). Follow up paired sample T-test confirmed the significant differences for those variables. All other variables were shown to be statistically significant, regardless of treatment from pre- to post-intervention measurements ($P > 0.05$). The subjects preferred TC over IASTM regardless, and both produced a decrease in pain (Preferred Intervention: IASTM = 12 and TC = 18).

Conclusion
Both IASTM and TC showed to have a significant impact on all ranges of neck motion measured. Left side lateral flexion showed the greatest improvement with IASTM, while forward flexion and left side rotation demonstrated the greatest improvement with TC. Pain was reduced for both interventions, with subjects preferring TC over IASTM. Healthcare providers might choose the treatment instrument based on patient preference since both showed to be effective.