

AACP REPORT

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“I Do Not Belong Here!” Innovative Learning Activity on Imposter Phenomenon Using Student-Created Infographics

Viveca Velez Negron, *Albany College of Pharmacy and Health Sciences*, Laurie L. Briceland, *Albany College of Pharmacy and Health Sciences*, Paul Denvir, *Albany College of Pharmacy and Health Sciences*. **Objective:** Imposter phenomenon (IP) occurs in individuals who doubt their abilities and experience persistent fear of being exposed as a fraud. Research shows that IP is prevalent among pharmacy students, residents/practitioners, and faculty. IP can lead to burnout, anxiety, and inability to recognize accomplishments, hindering one’s professional identity formation. It is important to introduce IP to students during the first professional year (P1), as early exposure can create habits of mind that minimize negative impact. **Objective:** To assess P1 student learning about IP through participation in varied activities, culminating in the creation of an IP infographic targeted to educate future P1 students. **Methods:** 168 students were introduced to IP through a P1 course lecture delivered by a P3 student, and completion of a validated survey to determine baseline IP tendencies. Student groups of 4 collaborated to create an infographic aimed at increasing IP awareness in future P1 students. Infographics included information from IP lecture and survey results. Quantitative and qualitative methods were integrated to assess learning outcomes: infographics were evaluated for completeness and visual literacy utilizing a grading rubric, and student learning was self-assessed by anonymous Poll Everywhere survey. **Results:** Survey results indicated 58% of P1 students exhibited IP tendencies within clinical range. Student groups demonstrated IP learning through developing highly creative and visually appealing infographics, with mean score 85% (4.27/5) per graded rubric. 92% and 99% of students respectively agreed that they can confidently describe IP and design an infographic with acquired knowledge for target audience. **Conclusions:** Students demonstrated learning about IP through participation in lecture, IP survey and creation of infographic intended to educate future P1 students about this important topic that is prevalent in P1 students.

A National Survey of African American Women with Reported Past Year Opioid Misuse

Debbynie J. Barsh, *Howard University*, Mary K. Awuonda, *Howard University*, Monika Daftary, *Howard University*, Earl Ettienne, *Howard University*, la’ Marcus Wingate, *Howard University*. **Objective:** There is a lack of research studying the opioid crisis within a sample of African American (AA) women only. Given the recent increase in opioid overdose deaths in AAs and the vulnerability of women who misuse opioids, research in this population is important. **Methods:** A sample of adult aged (18+) AA women from the National Survey on Drug Use and Health (NSDUH) from 2015-2019 was used (N=15,196). Odds ratios were estimated using weighted logistic regression models. **Results:** Weighted findings show 3.14% of AA women reported past year opioid misuse. Past year major depressive episode, alcohol use, and illicit drug use, as well as, receiving 1 or more government programs were all significantly associated with more odds of past year misuse. An excellent general health rating and higher education resulted in significantly lower odds of past year misuse. Those between 18 – 25 were significantly associated with higher odds of past year misuse compared to those over 50. The association for income and past year misuse was surprising. Adjusting for other factors, those who made over \$75,000/year had more odds of past year misuse when compared to those who made less than \$20,000/year. Though this result was not significant, higher odds was not expected of this group as previous research shows higher odds among lower income groups instead. **Conclusions:** Though results related to income were not expected, other results of this study align with the literature. Future research should focus on subgroups at high risk of opioid misuse in this population.

A Pharmacy Student-Led Educational Session on Neuropsychiatric Medications for Social Work Students

Esther H. Kanner, *Long Island University*, Mark Maranan, *Long Island University*, Joshua Yaich, *Long Island University*, Zenab Ali, *Long Island University*, Hesham Abdalla, *Long Island University*, Sara Grossman,

Long Island University, Eric Ocheretyaner, *Long Island University*, Elizabeth Kudadjie-Gyamfi, *Long Island University*. **Objective:** To educate LIU Master of Social Work (MSW) students about neuropsychiatric medications through an educational session led by LIU pharmacy students. **Methods:** In February 2022, third-year Doctor of Pharmacy students serving as Rho Chi chapter officers organized a virtual seminar on neuropsychiatric medications for MSW students. The 90-minute session was designed to review the pharmacology, adverse effect profile, and counseling points for the most common neuropsychiatric drug classes. Pre- and post-event questionnaires were used to assess MSW students' knowledge of neuropsychiatric medications and perception of the importance of this topic. One-sample t-test and binomial analyses were employed for comparisons. **Results:** Eighty-one students and five faculty members from the MSW program participated in the session. Pre- and post-event questionnaires were completed by 50 (62%) and 41 (51%) students, respectively. Overall scores for students who completed all 5 knowledge-based questions were significantly higher in the post-event questionnaire (3.55 ± 1.02) versus the pre-event questionnaire (3.07 ± 1.24); $t(28) = 2.54$, $p = .02$. After the session, 27 (66%) students reported having an understanding of the classes of medications used to treat neuropsychiatric disorders as compared with 16 (34%) students prior to the session. After the session, all respondents recognized the importance of interprofessional collaboration for patient care. Additionally, at the conclusion of the session, 37 (88%) respondents believed that knowledge gained from the information session will improve the way they practice. Overall, MSW students and faculty expressed appreciation for the session and were enthusiastic about future collaborative events. **Conclusions:** The pharmacy student-led neuropsychiatric educational session had a positive impact on MSW students. This session will serve as a springboard for future collaboration between the schools of pharmacy and social work at LIU.

A Scoping Review of Critical Theories in Health Professions Education

Kyle T. Fassett, *University of North Carolina at Chapel Hill*, Jacqueline McLaughlin, *University of North Carolina at Chapel Hill*. **Objective:** Critical theories, such as Feminist and Queer Theory, emerged to address social and organizational structures that disadvantage marginalized groups, with some of the earliest applications to health professions education occurring in the 1970s. Critical Race Theory, developed in the 1990s, ignited conversations about racial inequities within law and resurfaced recently with widespread contention, debate, and protests.

Building on this discourse, we explored how health professions educators used critical theories in their research, and which theories, disciplines, and authors informed their application. **Methods:** We conducted a scoping review of research in the health professions education (e.g., nursing, pharmacy, medicine), searching four databases with 850+ terms. Articles were included if they used critical theory, pertained to health professions, and were published. We evaluated the extent of author application of critical theories using Kummasi's Theory Talk framework, rating papers on a scale of minor (e.g., naming a theory), moderate (e.g., discussing a theory), and major (e.g., using a theory empirically). **Results:** The search yielded 480 abstracts. Upon a full text review, 40 articles met all criteria; eight (20%) employed a theory majorly. We created counts based on text, finding most papers were published from nursing education ($n = 24$, 47.1%), broadly used Critical Theory ($n = 17$, 28.8%), cited Habermas and Lincoln ($n = 25$, 20.8%), and emerged between 2010-2019 ($n = 14$, 35%). No papers applied to pharmacy and few used Critical Race Theory ($n = 3$, 5.1%). **Conclusions:** The abundance of critical theories used in nursing juxtaposed to pharmacy raises questions about what perspectives are missing in pharmacy education, what can we learn from our colleagues, and what theories currently drive our field? We posit incorporating critical theories in scholarship might enrich pharmacy education, yielding positive results for learners.

Analysis of Pharmacy Students' Attitudes, Knowledge, and Stress Towards Debt

Kayla M. Thibodaux, *The University of Louisiana at Monroe*, Michael Cockerham, *The University of Louisiana at Monroe*, Oscar W. Garza, *The University of Louisiana at Monroe*. **Objective:** To determine whether students' attitudes, knowledge, and stress levels towards debt indicate the need for further instruction on financial literacy to be added into the PharmD curriculum at the University of Louisiana at Monroe. **Methods:** This was a cross-sectional survey study that included ULM pharmacy students from P1-P4 in the Fall of 2020. The survey included various questions to obtain information pertaining to student demographics, previous loan experience, attitudes towards debt, knowledge of debt and repayment, and stress towards debt. Attitudes towards debt items were further divided into 3 sub-categories of tolerance, deliberation, and fear of debt. **Results:** 187 survey responses were obtained. Approximately 92% of students planned to use student loans to cover their pharmacy school expenses, 37.4% carried loans from undergraduate study, and more than 55% had an estimated loan pay-off time of over 5 years. Only 12.3% of respondents reported previous instruction or courses directed towards personal finance or

student loan management. Respondents reported intermediate to high stress levels concerning debt with mean scores ranging from 6.22 – 8.21 (scale: 1-10). Survey psychometric analyses (eg Cronbach's alpha) suggested reasonable degrees of reliability and validity across the 5 primary domains: Tolerance (0.616), Fear (0.756), Deliberation (0.681), Knowledge (0.782), and Stress (0.758). **Conclusions:** The incorporation of financial literacy instruction to the PharmD curriculum may be beneficial to consider for improving student pharmacist well-being and overall career preparation.

Assessment of an Interprofessional Education Module Focused on Recognizing and Managing Burnout

Kelly Speirs, *The Ohio State University College of Pharmacy*, Alexa S. Valentino, *The Ohio State University College of Pharmacy*, Jennifer Seifert, *The Ohio State University*, Darryl T. Hamamoto, *The Ohio State University College of Dentistry*, Susannah Turner, *The Ohio State University College of Dentistry*, Danielle Whitaker, *The Ohio State University College of Dentistry*, Jay Mirtallo, *The Ohio State University College of Pharmacy*. **Objective:** The purpose of this study is to assess whether an interprofessional education (IPE) module improves students' interprofessional (IP) communication and teamwork skills related to recognizing and managing burnout in themselves and their team members. Many professional students experience symptoms of burnout as they progress through their programs, and students may also work on teams with other professionals who experience burnout. To prepare students to address this issue, third-year students from the colleges of pharmacy and dentistry (COP/COD) participated in an IPE module in February 2022. **Methods:** Faculty and staff from the COP and COD designed an IPE module consisting of several parts: (1) Students individually completed a case study featuring an IP team dealing with burnout at baseline and at the end of the module. (2) Information on burnout was provided asynchronously, and students took a quiz to assess their knowledge. (3) Students attended an in-person session where they worked within an IP group to discuss case scenarios that illustrate burnout. (4) Student feedback on the module, perceptions of how well the module achieved the objectives, and student responses to the Interprofessional Collaborative Competencies Attainment Survey (ICCAS) were collected via a survey following the session. **Results:** 125 pharmacy students and 12 dentistry students participated in the in-person session. Results are in progress. **Conclusions:** This project could show gaps in educational programming, while the post-module survey may give data on how to improve the

module for future iterations. The session emphasized working in interprofessional groups to recognize and manage burnout among both individuals and teams. The results of this research may be able to inform interprofessional education modules at other institutions.

By the Numbers: The Economic Value of Pharmacy Student Interventions on Acute Care Rotation

Alexander S. Perales, *Medical University of South Carolina*, Erin Weeda, *Medical University of South Carolina*, Elizabeth D. Weed, *Medical University of South Carolina*, Jennifer N. Wisniewski, *Medical University of South Carolina*. **Objective:** One-third of the Doctor of Pharmacy curriculum is focused on experiential education. This includes advanced pharmacy practice experiences (APPE) completed by fourth year pharmacy students over a twelve-month period. Studies have identified cost-saving contributions that pharmacists provide hospitals, but little data exist on the economic benefits provided by APPE students. This study sought to quantify cost-savings associated with interventions recommended by APPE students during acute care rotations. **Methods:** A systemic review was performed to identify United States studies evaluating cost avoidance associated with medication-related interventions performed by pharmacy personnel. Only studies evaluating hospital settings were included. A total of 856 articles were screened and 13 met selection criteria. A tool was used to assess the generalizability of each of the 13 articles. Cost estimates were ascertained from the article deemed to have the greatest generalizability. Interventions made by APPE students on various acute care rotations from 9/2020 to 3/2021 were consolidated into one of 11 categories. A cost (in 2020 US dollars) was attached to each of the 11 categories, and total costs were calculated. **Results:** Interventions from a cohort of 22 students were analyzed. Based on 223 interventions in 114 patients, the estimated total cost avoidance was \$40,929.22. The median cost avoided per patient was \$198.39 (interquartile range: \$99.74-\$673.39). The most frequent intervention was "medication dose or frequency adjustment" with 40 interventions. The highest contributing intervention was "medication reconciliation" with a \$23,371.05 contribution. **Conclusions:** Our small cohort of APPE students showed a substantial cost benefit to hospital sites. Our results add to the body of literature that supports the economic benefit of APPE students on rotation.

Characterization of Students' Knowledge, Stigma, and Risk Perceptions Towards PLWHA at a Hispanic Serving Institution

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University of Texas at El Paso School of Pharmacy, Gabriel Frieze, The University of Texas at El Paso School of Pharmacy, Heather Howell, The University of Texas at El Paso School of Pharmacy. **Objective:** To characterize pre-pharmacy and Doctor of Pharmacy students' stigma, risk perceptions, and knowledge towards people living with HIV and AIDS (PLWHA) at a Hispanic-Serving Institution in a predominantly Hispanic, bi-national border community. It was hypothesized that students with previous HIV content exposure would have decreased negative risk perceptions and stigma towards PLWHA. **Methods:** This was a prospective cross-sectional study conducted via electronic survey software. The survey was administered in the Fall 2021 semester and consisted of a 30-item questionnaire to collect baseline demographics, previous exposure to HIV-related content and HIV-positive patients, as well as HIV knowledge, stigma, and risk perceptions. Descriptive statistics were used for demographic variables. Percentages were examined for nominal variables and means, and standard deviations were examined for continuous variables. Chi-square analyses examined relationships between categorical variables and correlational analyses examined relationships between continuous variables. **Results:** One hundred and fifty-eight pharmacy students (Mage = 26.39, SD = 6.45) were recruited from the university to participate in the study. Preliminary analyses revealed that knowledge scores were only associated with one's willingness to share food with someone living with HIV/AIDS ($r = .30$; $p < .01$). Also, professional year was only correlated with knowledge ($r = .23$; $p < .01$) and willingness to share food with someone living with HIV/AIDS. Lastly, students with history of previous HIV material ($M = 6.53$; $SD = .81$) were more willing to vaccinate someone who is living with HIV/AIDS ($M = 6.00$; $SD = 1.22$), $t(122) = 2.91$, $p = .004$. **Conclusions:** Increased HIV exposure and knowledge may improve risk perceptions of PLWHA among pre-pharmacy and pharmacy students. Further conclusions will be reported upon finalization of data analyses.

Comparing Interactive Case-Based E-Learning with Paper-Based Cases in a Second Year Pharmacy Therapeutic Liver Course

Julie R. Beauchamp, *Western University of Health Sciences, College of Pharmacy*, Tracy Moore, *Western University of Health Sciences*, Hyma P. Gogineni, *Western University of Health Sciences College of Pharmacy.* **Objective:** Pharmacy educators had to adopt unique teaching methods to expose students to real-life clinical cases with distant tele-educational instruction during COVID-19 pandemic. Initiating collaboration between pharmacy faculty

and instructional designers is essential to develop interactive Case-Based E-Learning (iCBEL). This study investigated student's perceptions around the appeal, effectiveness, and efficiency of iCBEL cases compared to paper-based cases. **Methods:** Second year student pharmacists ($n=100$, 17 teams) enrolled in liver therapeutic course were provided access to both iCBEL module cases and paper-based cases. Participation was voluntary and had no impact on course grade. Four liver topics were selected for this study: acute liver failure (ALF), alcohol use disorder (AUD), non-alcoholic fatty liver disease (NAFLD) and cirrhosis. The content was delivered via pre-recorded Zoom lecture one day prior to case presentation and discussions. Instructional designers assisted faculty using Articulate Storyline 360 software to create iCEBL cases, which empowered students to depict the pharmacist-role in treating patient with ALF and AUD, while paper-based cases focused on cirrhosis and NAFLD. Students received a voluntary survey link upon completion of the course to evaluate the iCEBL cases compared to paper-based cases. **Results:** Of 100 students, 78% completed the survey, 67% were female, and 61% aged 25-34. Average completion time for iCEBL case was 1.23 hours versus 1.36 hours for paper-based case. Survey results revealed that nearly 99% of respondents agreed that iCEBL was appealing and effective in applying clinical knowledge, 97% agreed that iCEBL cases kept their interest, and were more motivated to learn compared to paper-based cases. **Conclusions:** Our results support that iCEBL is a viable option as a learning modality in pharmacy education. Students demonstrated high satisfaction and enjoyment with iCEBL module cases.

Describing an Asynchronous, Online Interprofessional Education Workshop for Advanced Practice Providers

Michael J. Peeters, *University of Toledo College of Pharmacy & Pharmaceutical Sciences*, Kaiya S. Hassan, *University of Toledo College of Pharmacy & Pharmaceutical Sciences*, Colleen Y. Taylor, *The University of Toledo College of Nursing*, Carolina Wishner, *The University of Toledo College of Medicine and Life Sciences.* **Objective:** Understanding the roles, responsibilities, and abilities of different providers is critical to quality, team-based healthcare. Our objective was to describe an asynchronous, online interprofessional workshop for non-physician advanced practice providers, wherein students learned about the provider roles and responsibilities of nurse practitioners (NPs), physician assistants (PAs), and pharmacists (Rx). **Methods:** In this four-week workshop, students from the NP, PA, and Rx programs participated in weekly video-based discussions about each of these professions. Students were split into interprofessional teams of approximately 2NP, 2PA, and

3Rx students. The weekly topics were: PAs, NPs, NPs vs PAs, and Clinical Rx's. At the beginning of each week, all students watched a video about the topic, and then created their video response to assigned questions. Afterwards, teammates from other professions replied to initial video responses. All participating students completed a post-workshop evaluation with open-ended text responses; using qualitative text analysis, these were inductively coded and themed by two investigators. **Results:** A total of 163 students participated in this workshop (56 NP, 40 PA, 67 Rx). Post-workshop evaluations showed that, overall, students agreed that the workshop was helpful and fit into their busy schedules. Most students' MOST favorite aspect was learning about their peers' professions and seeing their inter-professional teammates' unique perspectives each week. When asked about their LEAST favorite aspects, some students did not like recording videos in Flipgrid. Further, some students suggested varying the weekly prompts and using synchronous communication to improve the quality of their discussions further. **Conclusions:** Within this online, asynchronous workshop about roles and responsibilities of advanced practice (non-physician) providers, students from different professions described interacting as they learnt with, from, and about one another.

Does Cultural Change Translate to Policy Change? Investigating Cannabis-Use Policies in Pharmacy Colleges Across America

Megan Kaun, *The University of Toledo*, Michelle Seegert, *The University of Toledo*, David R. Keister, *The University of Toledo*. **Objective:** There have been dramatic legal changes regarding cannabis use over the last 10 years in the US including increases in legality of medicinal (74% of states) and recreational (36% of states) use. Legal changes and increased accessibility have resulted in increased use in the community and changes in cultural acceptance of use. The purpose of this study is to assess disciplinary and screening policies for cannabis use among all ACPE-accredited colleges of pharmacy while also gathering insight of responder's opinions to create guideline recommendations that colleges may reference when establishing or altering protocols. **Methods:** An online survey was developed and distributed by email to experiential directors of all ACPE-accredited colleges of pharmacy with reminders and updates sent to contacts as needed to ensure the best response rate from all schools. This survey had four main purposes: (1) assessing the university/school's screening policies for cannabis use, (2) evaluating disciplinary action taken in response to positive screening results, (3) gathering responder opinion on the college's policies and cannabis use, and (4) quantifying

positive cannabis tests within each school in the past five years. **Results:** Data collection is ongoing with expected completion by May 2022. Thus far, completed surveys have been submitted by 39 out of 138 colleges (28% response rate). **Conclusions:** It is anticipated many schools/universities do not have policies specifically addressing cannabis and THC, but some may have innovative policies. These policies along with responder opinions will serve as the foundation for the guideline recommendations to be established.

Does Current Bariatric Multivitamin Formulations meet 2019 Nutritional Guidelines?

Cez Dominique A. Juan, *Western University of Health Sciences*, Andrea Saenz, *Western University of Health Sciences*, Hyma P. Gogineni, *Western University of Health Sciences College of Pharmacy*. **Objective:** Additional multivitamin and mineral supplementation is essential in post-bariatric surgery patients. Currently, there are about 30 bariatric multivitamin products commercially available, each with varying doses and dosage forms to meet the American Society for Metabolic and Bariatric Surgery (ASMBS) nutritional guidelines. The primary objective of this study is to compare available tablet and chewable formulations of bariatric multivitamins to ASMBS nutritional guidelines based on the type of bariatric surgery performed. **Methods:** Authors conducted extensive product search and included all available oral bariatric multivitamins in the market and compared these with clinical practice guidelines for the perioperative nutrition metabolic and nonsurgical support of patients undergoing specific bariatric procedures such as Laparoscopic Adjustable Gastric Band (LAGB), Sleeve Gastrectomy (SG), Roux-en-Y Gastric Bypass (RYGB), and Biliopancreatic Diversion with a Duodenal Switch (BPDDS). Furthermore, risk of vitamin and mineral deficiencies were considered according to the type of surgery performed. Lastly, bariatric multivitamin products currently available in the market and from food sources were considered to satisfy possible deficiencies. **Results:** Among all the bariatric multivitamin products commercially available, 100% of the products needed additional vitamin B1 and calcium supplementation, 50% needed additional vitamin B12 and folic acid supplementation, 37% needed additional iron, 30% needed additional vitamin K, 13% needed additional vitamin D supplementation, and 7% needed vitamin A supplementation. **Conclusions:** Most available bariatric multivitamin products met the minimum recommended nutrient requirements set by the ASMBS guidelines; however, additional supplementation is needed for vitamins A, B1, B12, D and K along with calcium, iron, and folic acid. Nutritional deficiencies in bariatric surgery patients can be

easily corrected with additional supplementation or ingested through proper daily diet.

Evaluation of Near-Peer Instruction and Assessment within Professional Pharmacy Skills Laboratories

Leah C. Philipp, *Purdue University*, Kimberly Illingworth, *Purdue University*, Audrey Davis, *Purdue University*, Chelsea Baker, *Purdue University*. **Objective:** Near-peer instruction or assessment is defined as a junior learner instructed or assessed by a senior learner at least one year above the junior learner in training. Study objectives included 1) explore near-peer instruction and assessment in skills labs in pharmacy schools in the United States, 2) explore interest in the use of near-peers, and 3) assess their perceived benefits and limitations. **Methods:** Qualtrics (Qualtrics, Provo, UT) was used to administer a 45-item survey including sections on (1) Demographics, (2) Near-Peer Assistant Use, (3) Near-Peer Instruction, (4) Near-Peer Assessment, and (5) Benefits/Limitations. One laboratory instructor from each pharmacy school in the United States (N=140) was e-mailed for participation. Reminder emails were sent out one, two, and four weeks after the initial request. Data were analyzed using descriptive statistics. **Results:** Ninety-five percent of survey participants (N=40) reported using near-peer assistants in skills labs with a majority being pharmacy residents. The most common near-peer instructional activities included answering student questions and demonstrating how to perform skills, while the most common assessment activities included grading in-lab simulations and worksheets. Seventy-seven percent and 82% of participants currently using near-peer instruction or assessment, respectively, plan to maintain its use. Twenty percent and 15% of participants plan to expand near-peer instruction or assessment, respectively. The most common benefits were (80%) enhanced teaching skills and professional development for near-peers and (78%) opportunities for diverse teaching experiences for near-peers. The most common limitation (73%) was faculty members' concerns over the quality of near-peer instruction or assessment. **Conclusions:** Results provide insight into the use of near-peers in pharmacy skills labs and inform faculty when incorporating near-peer instructors in pharmacy skills labs.

Evaluation of Perceived Stress Among Academic-Affiliated Pharmaceutical Industry Fellows

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College of Pharmacy, Amee Mistry, Massachusetts College of Pharmacy and Health Sciences, Carolyn Seyss, Rutgers University Ernest Mario College of Pharmacy, Monica L. Miller, Purdue University College of Pharmacy. **Objective:** To examine the level of perceived stress that academic-affiliated post-doctoral pharmaceutical industry fellows experience, along with identification of the types of stressors they experience, possible factors associated with higher levels of perceived stress, and the state of resilience skills in this population. **Methods:** A multi-item survey instrument was created to collect information about fellow demographics, perceived stress, major stressors, and resilience skills. The survey also utilizes the Perceived Stress Scale (PSS-10), a validated psychological tool to measure the perception of stress, and the brief Connor-Davidson Resilience Scale (CD-RISC-10), a validated scale for measuring resilience. The study sample consists of 391 current postgraduate year one (PGY1) and postgraduate year two (PGY2) industry-affiliated pharmacy fellows in programs with academic collaborations with the Massachusetts College of Pharmacy and Health Sciences, Purdue University College of Pharmacy, or Rutgers University Ernest Mario School of Pharmacy who have a Doctor of Pharmacy degree, representing 69% of fellows in positions with academic partnerships. **Results:** Data collection is ongoing and will conclude in May of 2022. Data will be analyzed using descriptive statistics. Regression analysis will be conducted to assess potential relationships between perceived stress, fellow characteristics, and resilience skills. Findings will be compared to previously reported perceived stress levels in PGY1 pharmacy residents. **Conclusions:** This project contributes to the advancement of pharmacy practice by gauging the need for wellbeing and resilience initiatives directed at pharmaceutical industry fellows. Results from this research may be used to develop a customized wellness initiative to support this population.

Exploring the Relationship between Imposter Phenomenon and Myer-Briggs Personality Types in Pharmacy Students

Karl R. Kodweis, *University of Tennessee Health Science Center, College of Pharmacy*, Hilary M. Jasmin, *The University of Tennessee Health Science Center*, Elizabeth A. Hall, *The University of Tennessee*, Dawn E. Havrda, *The University of Tennessee*. **Objective:** To investigate the relationship between imposter phenomenon (IP) and Myers-Briggs Type Indicator (MBTI) personality types in pharmacy students. **Methods:** This retrospective cohort study design analyzed pre-existing student data collected as part of the curriculum. All students enrolled in the Doctor of Pharmacy program must take MBTI assessment in

the Fall of their first year. IP is assessed using the validated Clance Imposter Phenomenon Scale (CIPS) in January of each year of the PharmD program. The MBTI and CIPS data analyzed were collected in Spring 2022 for all class years (2022-2025). Student demographics, including age, race/ethnicity, and year in school, were collected. CIPS scores were compared between MBTI personality types using independent samples t-tests. **Results:** Mean CIPS score for currently enrolled pharmacy students (N=668) was 62.52 (SD 14.82). CIPS scores were significantly higher in students with MBTI of introversion (mean 64.14, SD 14.27) compared to extroversion (mean 60.53, SD 15.25) [p=.002], intuition (mean 63.80, SD 15.78) compared to sensing (mean 61.45, SD 13.89) [p=.042], and perceiving (mean 64.38, SD 15.55) compared to judging (mean 61.83, SD 14.49) [p=.047]. Mean CIPS scores between thinking (mean 61.81, SD 15.51) and feeling (mean 62.74, SD 14.60) personality types did not show statistical significance [p=.485]. **Conclusions:** These findings suggest that pharmacy students with MBTI indicators of introversion, intuition, and perception exhibit higher CIPS scores than their dichotomous counterparts.

Identification of Cytochrome P450 Enzymes Responsible for Oxidative Metabolism of Synthetic Cannabinoid (1-hexyl-1H-indol-3-yl)-1-naphthalenyl-methanone (JWH-019)

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oxidative metabolite in HLMs supplemented with NADPH. JWH-019 was extensively metabolized to 6-OH JWH-019 in HLMs with the Km and Vmax values of 31.5 μ M and 432.0 pmol/min/mg. The relative activity factor method estimated that CYP1A2 is the primary contributor to the metabolic reaction in the human liver. Animal study revealed that JWH-019 had a slower onset of action compared to natural and other synthetic cannabinoids. **Conclusions:** CYP1A2 mediates the metabolic activation of JWH-019, contributing to the slower onset of its pharmacological action.

Impact of Online Precepting-Focused Continuing Professional Development Program

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Objective: To determine the impact of an online continuing professional development (CPD) program on preceptors' abilities and techniques for teaching students in clinical settings. To determine areas of preceptor intended growth after program completion. **Methods:** In 2019, an online program to educate and support preceptors' use of CPD to create individualized clinical teaching development plans was launched. After allowing time for preceptors to implement their CPD plan, preceptors completed an 8-question survey to assess areas of intended growth and impact on clinical teaching. Two questions described completion of the CPD plan, with responses limited to "Yes", "No", or "Partially". Additionally, six open-ended questions allowed for descriptions of barriers, changes implemented, and overall teaching impact. Impact of implemented changes were categorized as: positive, negative, or no change. Changes implemented by preceptors were categorized as: goal setting, feedback, communication/education skills, student-teacher connection, or educational resources development. **Results:** Of the 119 preceptors who responded to at least one question, 52% fully implemented and 39% partially implemented their pre-identified CPD plan. Most responses regarding CPD implementation were categorized as having a positive impact on preceptor's clinical teaching (n=91; 93%). A total of 69 preceptors provided responses regarding impact of implemented activities; 95% reported a positive impact on their clinical teaching. Preceptor skill development was most commonly in educational resources development (37%), communication/educational skills (36%), and feedback (30%). **Conclusions:** This online precepting CPD program had a positive preceptor-reported impact on clinical teaching delivered by preceptors to students. Further investigation is needed to determine ability to disseminate this program to a larger scale, as well as resources necessary to assist preceptors in overcoming common barriers to implementation.

Impact of Pass/Fail vs Merit-Based Grading on Student APPE Rotation Performance Using an EPA-Based Evaluation

Farehaa Hussain, *University of South Carolina College of Pharmacy*, Whitney D. Maxwell, *University of South Carolina College of Pharmacy*, Jennifer L. Baker, *University of South Carolina*, Celia M. Dennison, *Medical University of South Carolina College of Pharmacy*, Elizabeth D. Weed, *Medical University of South Carolina*, Cathy L. Worrall, *Medical University of South Carolina College of Pharmacy*. **Objective:** The purpose of this study was to evaluate the student performance impact of implementing EPA-based APPE evaluation tools using a Pass/Fail grading schema versus a merit-based grading (MBG) system. **Methods:** 6,679 APPE evaluation scores were collected from two COPs across a 4-year timeframe, representing a 2-year pre-EPA implementation period (during which both COPs used an identical CAPE-based APPE Evaluation tool with MBG) and a 2-year post-EPA implementation period where one COP continued MBG and the other implemented Pass/Fail grading. Raw EPA rubric performance data from the COP using Pass/Fail grading were coded into MBG-equivalents to enable performance comparisons. Contingency tables were used for multivariate analysis and the Chi Square test was used for univariate analysis. **Results:** Mean raw performance scores decreased by 0.15 points and by 0.16 points at the two COPs respectively, following EPA implementation ($p < .001$ for both vs. baseline). At the COP maintaining MBG, there was a 2.4% decrease in B+'s ($p = .0003$) and a 0.6% increase in C+'s ($p = .0003$), with the remaining letter grades being statistically unchanged from baseline/CAPE. At the COP instituting Pass/Fail grading, the proportion of MBG-equivalent A's increased by 4.1% ($p = .002$), MBG-equivalent B+'s decreased by 6.7% ($p < .001$), and MBG-equivalent C's increased by 0.7% ($p = 0.001$) with the remaining MBG-equivalents being statistically unchanged from baseline/CAPE. **Conclusions:** EPA implementation appears to have deflated raw student performance scores and actual MBGs, with a significant shift from B+'s to more C+'s versus baseline at the COP maintaining MBG across time. At the institution implementing EPA evaluations with Pass/Fail grading, calculated MBG-equivalents appear to have shifted significantly from B+'s to more A's and marginally more C's versus baseline.

Influence of Underrepresented Minority Status on Pharmacy Residency Application and Match Rates

Kendall Kolk, *Shenandoah University*, Sanaa Belhiti, *Howard University*, Kayla Joyner, *Shenandoah University*, Tambe Ayuk-Arrey, *Howard University*, Mark

Johnson, *Shenandoah University*, Kelsey M. Morgan, *Shenandoah University*. **Objective:** Given the influence of modifiable and non-modifiable factors on match success, this study assessed the impact of underrepresented minority (URM) status on rates of application and match success between URM and non-URM students. **Methods:** Students who graduated from the Doctorate of Pharmacy Programs at Shenandoah University and Howard University between the academic years of 2016 and 2021 were included. Internal records, including data from PharmCas and ASHP's National Matching service, were used to collect student characteristics such as race/ethnicity, gender, grade point average (GPA), leadership, research involvement, visa-status, and timing of clinical rotations. Students were categorized as URM if school records delineated them as Black/African American, Hispanic/Latino, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander-Samoan. Non-URM categorization was given to students who identify as White or Asian. Chi-square analysis was used for comparisons. **Results:** Of graduated students ($n = 901$), URM students were less likely to apply for residency (109/417, 26%) compared to non-URM students (164/484, 34%, $p = 0.012$). In the cohort of students who applied, URM students (55/109, 50%) matched at a similar rate to non-URM students (91/164, 55%, $p = 0.415$). URM students were less likely to have research involvement (26% vs 41%, $p = 0.01$). Numerically lower rates of $GPA \geq 3.5$ were noted in the URM group (41%) compared to the non-URM group (52%, $p = 0.088$). **Conclusions:** At two schools of pharmacy, URM students were less likely to apply to a residency but just as likely to match. While this study compared some factors that may influence match success, URM status may influence application rates.

Math Matters: Categorizing Pharmaceutical Calculation Problems to Identify Opportunities for Improved Learning

Jessi E. Shelton, *Medical University of South Carolina College of Pharmacy*, Christopher Taylor, *Medical University of South Carolina College of Pharmacy*, Melissa Ferris, *Medical University of South Carolina College of Pharmacy*, Jennifer N. Wisniewski, *Medical University of South Carolina*. **Objective:** Miscalculations account for a significant portion of medication errors, and many go undetected; thus, it is imperative pharmacy students are competent at pharmaceutical calculations. The objective of this study was to categorize and analyze student performance on pharmaceutical calculations problems administered to second-year pharmacy (P2) students in a health-systems laboratory course. **Methods:** Ten categories of pharmaceutical calculations were determined by

the course coordinator for the P2 laboratory courses: compounding volume, displacement volume, dose, medication volume, opioid conversion, osmolarity, percent strength, rate, ratio strength, and tonicity. Performance history for quiz and exam data from Fall 2018 to Spring 2022 were retrospectively collected and categorized based on question type. Data were collected using item analyses from ExamSoft and included question ID, difficulty index, percent correct, and number unanswered. Data were summarized by Fall and Spring semesters using descriptive statistics. All survey data were anonymous. **Results:** Preliminary results indicate students correctly perform calculations with less than 80% accuracy across all categories except for rate calculations. Across all years, performance was worst on displacement volume calculations (74.3% correct) in the fall semester and tonicity calculations (64.1% correct) in the spring semester. Performance was the best on rate calculations (85.3% correct) in the fall semester and medication volume calculations (85.3% correct) in the spring semester. Further data analyses are ongoing. **Conclusions:** Preliminary results indicate unsatisfactory student performance across all pharmaceutical calculations categories during the P2 year, and further data analysis is ongoing. Given the potential consequences of pharmaceutical miscalculations, more work should be done to determine improved methods of learning.

Measuring Professional Confidence and Growth Mindset in First-Year Pharmacy Students' Drug Information Responses

Kristen Korankyi, *Concordia University Wisconsin School of Pharmacy*, Beth Buckley, *Concordia University Wisconsin School of Pharmacy*. **Objective:** Studies examining the effect of confidence and growth mindset (GM) on pharmacy student learning are intriguing. The objective of this study was to measure confidence and GM in first-year pharmacy (PY1) students regarding drug information (DI) response skills. Research questions included: 1. Define confidence, GM, and their relationship. 2. Identify baseline student and course characteristics related to confidence and GM. 3. Determine change in both over a semester. **Methods:** Forty-seven PY1 students completed an online pre and post-survey in the Fall 2021 term. Quasi-experimental research design included interventions of an introductory lecture and lab with activities on basic DI components, categorizing information, and crafting verbal and written answers. Assignments included four graded DI responses. Survey assessed confidence with three items about DI resources, verbal, and written responses. GM included eight items on knowledge base improvements, persistence when challenged, and interpretative

and writing skills. **Results:** Factor analysis and Cronbach's alpha tests validated confidence and growth. Confidence was a three-item index ($\alpha = .89$). GM ($\alpha = .66$) subdivided into four-item growth challenge and three-item capacity for challenge ($\alpha = .46$). Higher confidence related to course section ($r = .21$, $p = .10$) and female gender ($r = .19$, $p = .10$). Students of color scored higher on growth challenge ($r = -.21$, $p = .10$). Confidence was inversely related to capacity for challenge ($r = -.32$, $p = .03$), confirmed with regression analysis ($\beta = -.30$, $p = .04$) with lab section and gender as controls ($R^2 = .19$). Paired-samples t-tests for pre- and post-surveys showed higher post-scores for confidence about written answers for providers ($p < .001$). **Conclusions:** This study suggests a role of subjective confidence and GM as it relates to skills in writing DI responses. Consideration of confidence and GM when designing lessons to teach pharmacy practice skills could be valuable in enhancing an educator's toolbox.

miR-146a; A Potential Agent Against Shear Stress-Induced Activation of the Pro-Inflammatory and Pro-Proliferative Osteopontin Pathway

Xinge Zheng, *California Northstate University*, Vy K. Tran Luu, *California Northstate University*, Helen Alnabwani, *California Northstate University*, Mina Al-Sabbagh, *California Northstate University*, Islam N. Mohamed, *California Northstate University*. **Objective:** Osteopontin(OPN) is a shear-sensitive matricellular protein that promotes vascular inflammation and proliferation as pre-requisites for Atherosclerosis. MicroRNA-146a(miR-146a) is a key anti-atherogenic shear-sensitive microRNA that can modulate vascular inflammation. Nevertheless, little is known regarding the interplay between miR-146a and the expression of OPN and downstream signaling pathways in response to acute oscillatory shear-stress(OSS) conditions. The goal of our work is to evaluate whether the over-expression of miR-146a can modulate OSS-induced expression levels of OPN and downstream signaling pathways. **Methods:** Human Aortic Endothelial Cells(HAECs) were subjected to simultaneous OSS and unidirectional shear stress(USS) control conditions using the standard orbital shaking model in vitro. HAECs subjected to acute OSS conditions isolated from the edge of the cell culture dish were compared to those isolated from the center of the cell culture dish that were subjected to USS conditions. miR-146a and scramble control were over-expressed using standard transfection protocols. Levels of OPN, its receptor alphaV-Beta3 and downstream signaling messenger, TRAF6, were compared using western blot analyses. **Results:** Our results showed that HAECs subjected to OSS conditions increased levels of OPN, its receptor alphaV-Beta3 and downstream TRAF6, compared to

HAECs subjected to USS conditions. Whereas HAECs cultured under static control conditions showed no difference in expression between HAECs isolated from the edge versus the center of the culture dish. Over-expression of miR-146a blunted the OSS-induced expression of OPN, its receptor alphaV-Beta3 and TRAF6 compared to scramble control. **Conclusions:** Our findings suggest a potential role of miR-146a in suppressing shear-stress-induced activation of the pro-inflammatory and pro-proliferative OPN pathway. Further studies can confirm the anti-atherogenic effects of miR-146a and its direct interaction with the OPN pathway as a foundation for developing innovative miR-based agents for atherosclerosis.

Naloxone Training Resources and Preferences in Corporately-Owned versus Independently-Owned Alabama Community Pharmacies: A Cross-Sectional Survey

Hannah Bricker, *Auburn University- Harrison College of Pharmacy*, Sadie Newhouse, *Auburn University- Harrison College of Pharmacy*, Lindsey Hohmann, *Auburn University- Harrison College of Pharmacy*. **Objective:** Community pharmacists in the state of Alabama have the ability to furnish naloxone but may have various organization-level policies and training. The purpose of this study was to identify the differences between naloxone regulations, training, and resources in corporately-owned versus independently-owned pharmacies. **Methods:** This study was performed using an online cross-sectional survey distributed using an email listserv of community pharmacists licensed with the Alabama Board of Pharmacy. Outcome measures included: 1) in-house versus outsourced naloxone education/training topics (13-item multiple-choice); 2) naloxone training preferences (5-item multiple-choice); and 3) perceived usefulness of naloxone education sources (14-item Likert scale from 1=strongly disagree to 5=strongly agree). Data were analyzed using descriptive statistics, 2-sided Fisher's Exact tests for categorical outcomes and 2-sided Mann Whitney U tests for continuous/ordinal outcomes ($\alpha=0.05$). **Results:** Approximately 37% of respondents were female and 95% White with a mean age of 42 years ($N=64$). There were significantly less pharmacists who received naloxone training (77% vs 98%, $p=0.016$), naloxone education mandated by employers (7% vs 97%, $p<0.001$), and mean[SD] outsourced naloxone education topics (3.7[4.9] vs 8.5[4.2], $p=0.003$) in independent versus chain pharmacies. Additionally, most independent and chain pharmacies preferred naloxone training in an online self-study format (53% vs 45%, $p=0.529$), but differed in the perceived usefulness of training sources, with mean[SD] ratings lower for

employer-based training (2.93[0.96] vs 3.90[1.01], $p=0.003$), the Alabama Department of Public Health (2.87[1.19] vs 3.66[0.90], $p=0.024$), and the Veterans Affairs Administration (1.60[0.91] vs 2.41[0.98], $p=0.013$) amongst independents compared to chains. **Conclusions:** Pharmacists are not all receiving the same training in independent versus chain pharmacies. Targeted training efforts may lead to more efficient and informed dispensing of naloxone prescriptions.

Patterns of Psychotropic Medication Use and Adverse Childhood Experiences Among Oklahoma Foster Youth

Laura M. Tidmore, *University of Oklahoma Health Sciences Center*, Tammy L. Lambert, *University of Oklahoma Health Sciences Center*, Kevin C. Farmer, *University of Oklahoma Health Sciences Center*, R. Christopher Rathbun, *University of Oklahoma Health Sciences Center*, Carisa Wilsie, *University of Oklahoma Health Sciences Center*, Grant H. Skrepnek, *University of Oklahoma Health Sciences Center*. **Objective:** To compare the prevalence of Adverse Childhood Experiences (ACEs) among foster youth according to psychotropic medication use and to describe the proportion of psychotropic medication class utilization across ACEs. **Methods:** This retrospective cohort analysis of youth ≤ 18 years within one year following entry into foster care utilized Oklahoma Department of Human Services and administrative Medicaid claims data from 2014-2018. Included youth were in the foster care system for at least one year and continuously eligible for Medicaid. ACE categories were derived from caseworkers' substantiated reasons for removal from the biological home. Statistical inferences from chi-square tests utilized an a priori value of 0.05 for categorical analyses of medication use and ACE designation. **Results:** Overall, 514 of the 1,773 foster youth meeting inclusion criteria (41.4%) had at least one psychotropic medication. A higher prevalence of foster youth taking psychotropic medications were removed from their home due to emotional neglect (5.6% vs. 2.1%, $p<.001$), physical abuse (19.7% vs. 12.6%, $p<.001$), or sexual abuse (10.1% vs. 3.7%, $p<.001$) than those involving psychotropic medication use. ADHD medications were the most prevalent class among youth with physical abuse (28.9%), physical neglect (20.9%), or household domestic violence (10.7%), and shared the highest prevalence with antidepressants among youth with emotional neglect (38.2% for both) and sexual abuse (34.3% for both). Antidepressants were most prevalent among youth with emotional abuse (30.2%). **Conclusions:** ACE categories including emotional neglect, physical abuse, and sexual abuse may be key indicators for

additional medication monitoring, especially among those youth taking ADHD or antidepressant medications. Future research should seek to elicit trauma-informed risk factors of psychotropic medication use among foster youth.

Perceived Impact of Educational Environment on Providing Care for Diverse Populations

John G. Bonanno, *Western New England University*, Shannon Bailey, *Northern Light Eastern Maine Medical Center*, Joshua J. Spooner, *Western New England University*, Susan Capasso, *Bay Path University*, Alaina Macaulay, *University of Massachusetts Isenberg School of Management*, Shannon Kinney, *Western New England University*. **Objective:** To evaluate health professions student perceptions of diversity and the potential effects of educational environment on preparedness to work in diverse patient settings. **Methods:** Doctor of Pharmacy (PharmD) and Doctor of Occupational Therapy (OTD) students were asked to complete a questionnaire regarding multiple areas of diversity, including their comfort in ethnically diverse environments. A random subset of respondents were provided ancestry DNA tests and video recorded reviewing their results. This research had IRB approval; data were analyzed with GraphPad Prism. **Results:** Twenty-five students (8 OTD, 17 PharmD) completed the survey (11% response rate) representing the general makeup of the college population. Only half of respondents were sure they had completed diversity training, yet most preferred to learn, and saw value, in a diverse educational environment. Interestingly, older students favored a diverse work and/or educational setting more than younger students. Additionally, 94% of pharmacy students agreed/strongly agreed they were comfortable discussing ethnicity-related pharmacogenomics with patients. Finally, ancestry testing revealed that students were more diverse than they originally thought. **Conclusions:** Diversity and inclusion are important in health sciences education. Our results suggest that learning in a diverse environment may help future practitioners to care for diverse patient populations. Further, ancestry testing is a helpful tool for highlighting diversity in an educational setting. Our results support the goal of admitting and hiring diverse populations into health sciences programs to improve cultural humility and diversity among future practitioners.

Perceptions of the Use of Visitation Therapy Animals on School of Pharmacy, Students, and Faculty

Ashlee McMillan, *West Virginia University*, Ashleigh L. Barrickman, *West Virginia University*, Alese N. Photiadis, *West Virginia University*. **Objective:** Assess

student, faculty, and staff perceptions of visitation therapy animals (VTAs) within a School of Pharmacy. **Methods:** The School of Pharmacy adopted a Visitation Therapy dog (VTD) in Fall 2021. An anonymous, optional survey was administered to all faculty, staff and first through third professional year students. The survey assessed stress levels, happiness, and energy before and after the implementation of a therapy dog within the School, the benefits and barriers to having a VTA, and overall perceptions and experience. **Results:** One hundred and sixty individuals completed the survey. Of these, 148 (92.5%) respondents were “satisfied” or “very satisfied” with having a VTD. After implementation of a VTD, 44.38% indicated feeling less stressed, 58.13% indicated being happier, and 22.5% indicated having more energy. The three most impactful benefits were increased happiness (87.5%), distraction from stressors (81.25%), and decrease in overall and school-related anxiety (65%). Results indicated that distraction in class (12.03%) and allergies (13.92%) were the two biggest barriers to having a VTA on campus; however, 75.32% indicated no barriers. A majority of participants reported that seeing, playing with and petting the VTD was beneficial or very beneficial (90.6%, 93.1% and 90.6%, respectively). Respondents felt that having a VTD in the classroom and prior to skills assessments was also beneficial (78.1% and 79.4%, respectively). A qualitative analysis of participant comments included themes such as love, enjoyment, the VTD bringing a smile to everyone’s face, increasing student morale, and promoting other VTAs on campus. **Conclusions:** Implementation of a VTD has been beneficial to students, faculty, and staff. Future studies could evaluate more specific effects of VTAS on well-being and overall satisfaction within a School of Pharmacy.

Pharmacodynamics of Polymyxin B and Ceftazidime-Avibactam Against Mixed Cultures of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*

Anmolpreet Kaur, *California Northstate University*, Austin Qiu, *California Northstate University*, Justin Lenhard, *California Northstate University*. **Objective:** We sought to quantify the pharmacodynamics of polymyxin B (polyB), ceftazidime, and ceftazidime-avibactam (CZA) against co-cultures of *Pseudomonas aeruginosa* (PA) and carbapenem-resistant Enterobacterales. **Methods:** Two PA isolates (PA1 and PA2), one *Klebsiella pneumoniae* carbapenemase producing *K. pneumoniae* isolate (KPC-KP), and one New-Delhi-metallo-beta-lactamase-1-producing *K. pneumoniae* isolate (NDM-KP) were investigated. Time-kill experiments were conducted over 24 hours using a starting inoculum of 10^6 CFU/mL of

each isolate. Concentration arrays of each antibacterial were evaluated against each organism in monoculture and co-cultures of PA cultured with *K. pneumoniae*. The area under the CFU curve (ceftazidime and CZA experiments) or the maximum log reduction (polyB experiments) was calculated for each drug concentration, and a Hill-type mathematical model determined maximal antibacterial killing (Emax). **Results:** PolyB achieved an Emax of 3.75 (95%CI:2.63-4.88) against the PA1 in monoculture, whereas the Emax was 4.03 (95%CI:3.97-4.08) and 3.10 (95%CI:1.84-4.35) during co-culture with KPC-KP and NDM-KP, respectively. When PA2 alone was exposed to polyB, the Emax was 3.67 (95%CI:2.71-4.63), whereas the Emax was 4.24 (95%CI:2.30-6.17) and 4.01 (95%CI:3.42-4.60) when cultured with KPC-KP and NDM-KP, respectively. The Emax of ceftazidime against PA1 was 2.81 (95%CI:2.74–2.88) during monoculture experiments versus 0.73 (95%CI:0.64–0.82) when KPC-KP was present, whereas the Emax of CZA against PA1 cultured with KPC-KP was 2.45 (95%CI:2.26-2.63). Ceftazidime alone achieved an Emax of 2.98 (95%CI: 2.89–3.08) against the PA2 in monoculture and an Emax of only 0.33 (95%CI:0.20–0.46) when PA2 was cultured with KPC-KP, whereas the Emax for CZA was 2.66 (95%CI:2.57–2.74) against PA2 cultured with KPC-KP. **Conclusions:** Pending future in vivo studies, these results indicate that polyB and CZA may be effective options for polymicrobial infections that involve drug-resistant pathogens

Pharmacy Student Perceptions of Reflective Writing Utility in Pharmacy Didactic Learning: A Cross-Sectional Survey Study

Zach J. Krauss, *Cedarville University*, Chrissy Capo, *Cedarville University*, Martha Abraham, *Cedarville University*. **Objective:** Current standards encourage integration of reflective writing throughout pharmacy education including didactic, experiential, and co-curricular learning. Most research on reflective writing focused on perceptions solely extrapolated from course evaluations or student academic performance. The purpose of this project is to directly assess student perceptions of reflective writing in pharmacy education. **Methods:** A prospective observational study with a cross-sectional design was implemented utilizing a survey instrument assessing pharmacy student perceptions of reflective writing in four areas of pharmacy curricula: overall use in curriculum, didactic training, experiential learning, and co-curricular participation. The survey was pre-tested by pharmacy faculty and three students from each year. 5-point Likert-type questions assessed agreement in each of the four areas. Descriptive statistics were run using SPSS version 28. **Results:** 120 responses were collected.

When asked about reflective writing in professional development, didactic training, and experiential learning, most students “slightly agreed” that reflective writing is important (n=35, 32, and 36, respectively, average 28.6%). Students tended to disagree with the utility of reflective writing to assist with understanding difficult concepts (34, 28.3%) or preparing for assessments and exams (35, 29.2%); however, many believe reflections aid with final-year preparation (33, 27.5%). Several questions were statistically significant based on pharmacy class including impact on professional development (p=0.004) and impact on information retention in coursework (p=0.017) **Conclusions:** In Ohio, pharmacy students agree that reflective writing is effective in improving didactic, experiential, and co-curricular learning. Students perceive reflective writing to be effective for final-year rotation preparation, but perceive little benefit for mastering course content. Research assessing larger cohorts with qualitative assessment would be beneficial to fully explore the utility of reflective writing.

Physician Perceptions of Pharmacists’ Roles in the Medication Use Process

Eunhee Kim, *Western University of Health Sciences, College of Pharmacy*, Jammie Luong, *Western University of Health Sciences, College of Pharmacy*, Amanda Mercadante, *Western University of Health Sciences, College of Pharmacy*, Marcia Worley, *The Ohio State University, College of Pharmacy*, Anandi V. Law, *Western University of Health Sciences, College of Pharmacy*. **Objective:** With the incorporation of interprofessional education, have physician perceptions of pharmacist roles changed? To examine physician perceptions of pharmacists’ roles in the Medication Use Process (MUP). **Methods:** Cross-sectional survey with Qualtrics online physician panel. Using Role Theory as framework, a 15-item survey was developed to explore physician perceptions of pharmacist roles in the 5-step MUP: prescribing, transcribing, dispensing, administering, and monitoring, and in direct patient care services and interprofessional collaborations. This IRB-approved survey examined physician perceptions regarding effectiveness of and best choice for improving the MUP step (Likert-type responses); and open-ended questions explaining rationale. Descriptive analysis of survey data and content analysis of open-ended responses were performed. **Results:** Completed responses were obtained in November 2021 from 200 physicians representative of the U.S. physician population in terms of age, gender, and ethnicity. A majority (78.5-86%) of respondents believed prescriptions are generally error-free and filled on time. A similar number (71-89.5%) reported medications are administered correctly, and patients are

adequately monitored. Half the sample (57-65.5%) agreed that patients usually receive adequate medication counseling and use their medications as directed. Physicians selected 'pharmacists' as their top choice for helping reduce medication dispensing errors, providing adequate counseling, and helping patients take medications as directed. Physicians who have or want to collaborate with pharmacists named medication adherence and counseling as areas for collaboration. A quarter of the respondents (24%) were not interested in pharmacist collaboration. Analysis of open-ended comments showed recurring themes involving physician roles, technology, and teamwork. **Conclusions:** Consistent with previous studies, physicians perceived pharmacists playing an important role in dispensing medications but not in prescribing medications or monitoring patients. Changes in perceptions involved recognition of pharmacist roles in counseling patients.

Practice Transformation Starts in the Classroom: Mapping Practice Change Learning in a PharmD Program

Ashley M. Erdmann, *The Ohio State University College of Pharmacy*, T'Bony Jewell, *The Ohio State University College of Pharmacy*, Michael Murphy, *The Ohio State University*, Jennifer L. Rodis, *The Ohio State University College of Pharmacy*. **Objective:** To 1) Propose a definition for practice change teaching and learning for student pharmacists and 2) Discuss process and lessons learned from mapping practice change topics in a Doctor of Pharmacy (PharmD) curriculum. **Methods:** To support student pharmacists and new practitioner engagement in practice transformation, learning outcomes in practice change must be addressed in the PharmD curriculum. Four main categories encompass the 25 ACPE 2016 standards: Foundational Knowledge, Essentials for Practice and Care, Approach to Practice and Care, and Personal and Professional Development. A public, research-intensive college of pharmacy created a task force to map ability-based outcomes and standard key elements to practice change learning topics across didactic courses and co-curricular activities. Through faculty interviews and committee discussion, opportunities and needs for teaching and learning in this area were identified. Faculty served as course content experts to provide guidance on key elements and outcomes as well as describe learning experiences and gaps for their courses. **Results:** Learning experiences related to practice change were identified amongst courses and co-curricular activities that mapped to all four domains of ACPE standards. Opportunities were identified to increase hands-on demonstration of learning in the areas of practice

planning, including billing and collaborative practice agreements. Another gap in learning included strategies to engage in continuous professional development related to practice change. **Conclusions:** Practice change learning outcomes can be mapped to ACPE Standards 2016. Evaluation of an institution's PharmD curriculum identified opportunities to integrate and expand priority practice change concepts into courses to equip student pharmacists with skills to engage as practitioners in rapidly evolving practice sites. Next phase involves development of new learning experiences to address identified gaps and opportunities.

Predictors Affecting Academic Progression in a Pharmacy School Program

Christene M. DeGracia, *University of Houston*, Austin De La Cruz, *University of Houston*, Aditi Marwaha, *University of Houston*, Marjan Zakeri, *University of Houston*, Sujit Sangsiry, *University of Houston*, Kimberly Nguyen, *University of Houston*. **Objective:** Prior research conducted at the University of Houston College of Pharmacy (UHCOP) has shown that holistic composite scoring is a strong predictor for post-admission academic success, however it remains unclear what factors lead to lack of academic progression. The objective of this study is to evaluate what factors may lead to lack of progression due to academic performance for individuals that applied, interviewed, and were admitted to UHCOP. **Methods:** This is a retrospective, observational study involving first, second, third, and fourth-year students who were admitted to UHCOP and placed on academic suspension or probation from the start of the integrated curriculum admitted 2018 through the fall 2021 academic year. Included students are compared to their classmates with on-time progression using data points such as age, pre-requisite and pharmacy school grade point averages (GPA), multiple mini interview score, holistic composite score, and Pharmacy College Admission Test (PCAT) score, if applicable. Additionally, secondary endpoints include correlation of admission components such as degree attainment prior to pharmacy school and institution previously attended in relation to academic progression. **Results:** 58 out of 501 students (11.58%) were placed on academic suspension or probation with an average GPA of 2.085 during the studied time period between 2018 and 2021. Of these 58 students, 57% experienced progression issues during the fall of their first-year of pharmacy school, with comparatively more students experiencing progression issues during the fall 2021 semester. **Conclusions:** Study findings will help to identify earlier interventions for at-risk students and help revise parameters within the holistic score to assist with the admission decision making process.

Reinforcing Pharmaceutical Calculations Through an Interactive Immediate Response Learning Program

Zachary Weinstein, *Rosalind Franklin University of Medicine and Science*, Danielle M. Candelario, *Rosalind Franklin University of Medicine and Science*, Kristen Ahlschwede, *Rosalind Franklin University of Medicine and Science*. **Objective:** Mastery of pharmaceutical calculations is a required component of pharmacy school curricula. Given that Pharmaceutical Calculations is a historically difficult course, supplementary or alternative teaching modalities incorporated into the course framework could improve conceptualization, student comprehension, and course performance. The objective of this study was to evaluate the use of an online immediate response learning program (IRLP) that could aid students in the conceptualization of IV dosing-related calculations. **Methods:** A cost-effective, low-code IRLP was designed to assist with conceptualization and reinforcement of core pharmaceutical calculations concepts, while providing formative feedback. The IRLP was incorporated into the first-year Doctor of Pharmacy pharmaceutical calculations course. Utilizing the Qualtrics platform, the IRLP depicts multiple simulated patient dosing-related questions and health outcomes corresponding to student responses. The program was a required supplemental study material to traditional homework assignments. An anonymous 19-item perceived value survey was distributed to determine IRLP effectiveness and value. The study was approved by the university institutional review board as exempt. **Results:** A total of 59 students completed the program. Although only 14.9% of students preferred the IRLP as their study method, 88.9% of participants felt that it was a useful supplement to homework and lectures. A majority of respondents reported that the program improved their clinical understanding (88.9%) and overall comprehension (88.9%). Exam performance grades did not differ from a historical control ($p > 0.05$); however, average final course grades improved when comparing 2020 ($78.30 \pm 9.39\%$) and 2021 ($84.38 \pm 8.72\%$) cohorts ($p < 0.001$). **Conclusions:** An immediate response learning program serves as a useful, low-cost, and novel supplemental learning tool in a pharmaceutical calculations course. Our IRLP increases student comprehension, performance, problem-solving ability, and clinical understanding of pharmaceutical calculations.

Shared Opioid Use Disorder Curriculum Development, Phase I: Assessment of Current Content in PharmD Programs

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of Pharmacy, Geoffrey Curran, *University of Arkansas for Medical Sciences College of Pharmacy*, Carol Ott, *Purdue University College of Pharmacy*, Margie Snyder, *Purdue University College of Pharmacy*, Karen Hudmon, *Purdue University College of Pharmacy*. **Objective:** Pharmacists can provide important interventions to combat the ongoing opioid epidemic in the US. Although opioid use disorder (OUD) is a Tier 1 competency in PharmD programs, little is known regarding the specific content delivered. The objectives of this study were to (1) characterize the instructional settings, delivery methods, and assessment methods for OUD content in PharmD programs, (2) assess faculty perceptions of OUD content, and (3) assess faculty perceptions of the concept of a national, shared OUD curriculum. **Methods:** This was a national, cross-sectional, descriptive survey study. Survey measures were designed to assess OUD content, faculty perceptions, and faculty and institutional demographics. A list of contacts was developed for each accredited, US-based PharmD program with a publicly-accessible online faculty directory ($n=137$). Recruitment and telephone survey administration occurred between August and December 2021. Descriptive statistics were computed for all items. **Results:** One faculty member from each of 67 PharmD programs (48.9%) participated. All programs incorporated OUD content into required coursework. Didactic lectures were the most common delivery method (98.5%). Programs delivered a median of 7.0 hours (range, 1.5-33.0) of OUD content, with nearly 85% achieving the 4-hour minimum as recommended by AACP. Just over half (56.8%) of faculty agreed or strongly agreed that their students were adequately prepared to provide opioid interventions; however, fewer than 40% perceived topics such as stigma, screening/assessment interventions, and resource referral interventions to be covered adequately. Over 75% expressed high or extremely high interest in a shared OUD curriculum. **Conclusions:** Enhanced OUD education is needed in PharmD programs. A shared OUD curriculum was of interest to faculty and should be explored further as a potentially viable solution for addressing this need.

Taking a Step Forward in Learner Feedback

Anthony J. Maher, *Royal College of Surgeons of Ireland*, Judith Strawbridge, *Royal College of Surgeons of Ireland*, Muirne Spooner, *Royal College of Surgeons of Ireland*. **Objective:** Feedback between students and faculty is effective when it supports learning. Our BEME systematic review identified that feedback is rarely defined, with diversity in conceptualisation by students and faculty.

There are complex interactions between the student, the nature of the feedback, the supervisor and environmental factors. These determine if and when feedback is used, and whether the effect is supportive or inhibitive of learning. Building from the practice points of the review, we aim to explore student and faculty perceptions of feedback to develop and implement a research informed institutional feedback strategy. **Methods:** Eight focus groups (four among staff n=28; four among students n=30) were conducted in a convenience sample among the school of Medicine and the School of Pharmacy and Biomolecular Sciences in RCSI, Dublin. The focus group theme sheet addressed practice points to explore participants' perceptions of how these would be operationalised. The audiotaped conversations were transcribed verbatim, and thematically analysed using template analysis and NVivo12 Software. **Results:** Thematic analysis is ongoing. Preliminary findings suggest that student experience of feedback does not consistently match best practice guidelines. Students report that there is insufficient feedback, varying formats, and negative emotions. They identify factors which will support emotions and creation of a supportive feedback environment. Faculty express challenges with managing learner emotions, navigating difficult conversations and meeting student expectations. **Conclusions:** A model of implementation is in development drawn from the analysis. Initial strategies to implement learner-centred feedback which embody the practice points include: feedback literacy training within curricula, faculty development with a focus on the social act of feedback and creating a safe learning environment.

The Impact of Online Learning on Academic Performance and Confidence in Pharmacy Student Learning Outcomes

Joana Leung, *University of Southern California*, Kimmie Hang, *University of Southern California*, Emily Hou, *University of Southern California*, Taylor Kwan, *University of Southern California*, Maryann Wu, *University of Southern California*. **Objective:** To determine the effect of online learning on both academic performance and pharmacy student confidence on the USC School of Pharmacy's (SOP) Ability Based Outcomes (ABOs). **Methods:** P2 (Class of 2024), P3 (Class of 2023), and P4 (Class of 2022) pharmacy students enrolled at the USC SOP were sent an anonymous Qualtrics survey composed of 16 questions, which gathered information regarding grade point averages (GPAs) and students' self-perceived confidence during online learning. Students' self-perceived confidence in the USC SOP's ABOs were measured using a 6-point Likert rating scale. **Results:**

Descriptive analysis was conducted to analyze the respondents' GPAs. P4 (Class of 2022) and P3 (Class of 2023) respondents who experienced in-person learning and then transitioned to online classes had an increase in their GPA. P2 (Class of 2024) respondents who started didactics online first had a decrease in their GPA when they transitioned to in-person learning. Additionally, when asked about confidence levels in USC SOP's ABOs, students felt the most confident in "self awareness" and least confident in "innovation and entrepreneurship". **Conclusions:** Student success with online learning depends on various factors, including motivation and access to online resources. Further research still needs to be conducted to determine the long-term impact of the COVID-19 pandemic on pharmacy students' academic and professional achievements. Further evaluation of the pharmacy curriculum and ABOs is also required to identify best practices and pinpoint areas for improvement, which includes increasing student confidence levels.

TXNIP's Role in Development of High Fat Diet-Induced Inflammation & Early Markers for Alzheimer's Disease

Vy K. Tran Luu, *California Northstate University*, Xinge Zheng, *California Northstate University*, Azza B. El-Remessy, *N/A*, Islam N. Mohamed, *California Northstate University*. **Objective:** Obesity and Insulin resistance are established risk factors for Alzheimer's Disease (AD). Several studies have shown upregulation of pro-inflammatory Toll-Like Receptors (TLRs) and downstream Thioredoxin Interacting Protein (TXNIP) and NOD-like 1-7 receptor protein 3 (NLRP3) inflammasome axis in models of AD. We hypothesized that genetic deletion of TXNIP would protect against activation of TLR pathway and TXNIP-NLRP3 axis in the brain of a mouse model with a high-fat diet (HFD) **Methods:** Six-weeks old age- and gender-matched wild-type mice (WT) and TXNIP knock-out (TKO) mice were randomized for normal diet (WT-ND & TKO-ND) or HFD (WT-HFD & TKO-HFD) for 8-weeks. Frontal cortex brain samples from all groups were analyzed using western blot analyses for expression of TLR pathway, NLRP3 activation, and markers of AD. Two-way ANOVA was used for statistical analysis between all groups. **Results:** After 8 weeks of HFD, there was a trend towards increased TLR4 receptor expression, which was associated with significantly increased levels of downstream HUR & IRF3 signaling pathways, as well as a trend towards increased levels of cleaved caspase-1, cleaved IL-1b, and phosphorylated tau protein levels in WT-HFD versus WT-ND group, but not in the TKO-ND nor TKO-HFD groups, indicating

increased NLRP3 activation. HFD also resulted in a similar trend of increased levels of amyloid-beta monomers in both WT-HFD & TKO-HFD groups versus the WT-ND group (n=6, P< 0.05). **Conclusions:** Our results support the critical role of TXNIP in protecting against HFD-induced insulin resistance and associated systemic

inflammatory response via the pro-inflammatory TLR pathway and NLRP3 in mouse brain tissue. Further studies are warranted for dissecting the interplay between TXNIP-mediated activation of the TLR pathway and accumulation of amyloid-beta and phosphorylated Tau protein levels